United States Court of Appeals for the Federal Circuit

IROBOT CORPORATION,
Appellant

v.

INTERNATIONAL TRADE COMMISSION,
Appellee

SHENZHEN ZHIYI TECHNOLOGY CO., LTD., DBA ILIFE,
Intervenor

2018-1690

Appeal from the United States International Trade Commission in Investigation No. 337-TA-1057.

Decided: April 19, 2019

WILLIAM M. JAY, Goodwin Procter LLP, Washington, DC, argued for appellant. Also represented by DAVID ZIMMER, Boston, MA.

RONALD TRAUD, Office of the General Counsel, United States International Trade Commission, Washington, DC, argued for appellee. Also represented by DOMINIC L.

BIANCHI, WAYNE W. HERRINGTON, PANYIN HUGHES.

NICHOLAS A. BROWN, Greenberg Traurig LLP, San Francisco, CA, argued for intervenor. Also represented by JONATHAN D. BALL, New York, NY.

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Before DYK, MAYER, and BRYSON, *Circuit Judges.*

Opinion for the court filed by *Circuit Judge* DYK.

Dissenting opinion filed by *Circuit Judge* BRYSON.

DYK, *Circuit Judge.*

Petitioner, iRobot Corporation ("iRobot") appeals the United States International Trade Commission's ("ITC's") final decision terminating its investigation regarding U.S. Patent No. 9,486,924 ("the '924 patent"). Because we agree with the ITC's construction of the claim term "instructions," which iRobot agrees is determinative of infringement, we *affirm*.

BACKGROUND

iRobot is the owner of the '924 patent and the manufacturer of a line of cleaning robots, named Roomba®. The '924 patent relates to such robots. Independent claims 1 and 12 of the '924 patent, which are at issue in this case, recite

> 1. A method of cleaning a room, the method comprising:
>
> transmitting from a cleaning robot to a mobile phone a status of the cleaning robot; and
>
> receiving at the cleaning robot from the mobile phone, in response to an operator command input at the mobile phone and at least in part indicative of a schedule, information including <u>instructions configured to cause a</u>

<u>processor of the cleaning robot to execute a cleaning operation in the room according to the schedule</u>, wherein executing the cleaning operation in the room according to the schedule comprises:

leaving a stationary charging device at which the cleaning robot is docked according to the schedule, and

navigating about a floor surface of a room.

* * *

12. A method of controlling a cleaning robot to clean a room, the method comprising:

initiating formation of a wireless communication link between the cleaning robot and a mobile phone; and

entering an operator command input into the mobile phone to cause the mobile phone to transmit, using the wireless communication link, information to the cleaning robot, the operator command input being at least in part indicative of a schedule, <u>and the information comprising instructions configured to cause a processor of the cleaning robot to perform operations including executing a cleaning operation in the room according to the schedule</u>, wherein executing the cleaning operation in the room according to the schedule comprises:

leaving, according to the schedule, a stationary charging device at which the cleaning robot is docked, and

navigating about a floor surface of the room.

'924 patent, col. 12, ll. 51–64 (emphasis added); *id.* col. 13, l. 32–col. 14, l. 3 (emphasis added).

On May 23, 2017, the ITC instituted an investigation under section 337 of the Tariff Act of 1930, 19 U.S.C. § 1337, based on a complaint filed by iRobot alleging infringement of the '924 patent. The Administrative Law Judge ("ALJ") construed the term "instructions," which appears in independent claims 1 and 12 of the '924 patent, to mean "software program or machine executable code." J.A. 49–58.

Based on this construction, respondents Shenzhen Zhiyi Technology Co., Ltd.; Shenzhen Silver Star Intelligent Technology Co., Ltd.; Hoover Inc.; and Royal Appliance Manufacturing Co. d/b/a TTI Floor Care North America, Inc. (collectively, "respondents") filed an unopposed motion for summary determination of non-infringement of the '924 patent. Because the parties did not dispute that the respondents' accused products do not infringe any claims of the '924 patent under the ALJ's construction of "instructions," the ALJ granted the respondents' motion. On January 16, 2018, the ITC determined not to review the ALJ's initial decision, and the decision therefore became final. iRobot appeals. We have jurisdiction pursuant to 28 U.S.C. § 1295(a)(6). We review the ITC's claim construction determinations de novo except for subsidiary facts based on extrinsic evidence, which we review for substantial evidence. *Cisco Sys., Inc. v. Int'l Trade Comm'n*, 873 F.3d 1354, 1360 (Fed. Cir. 2017).

DISCUSSION

On appeal, iRobot's sole argument is that the claim term "instructions" should have been construed to mean "scheduling information," as opposed to "program or machine executable code." iRobot argues that its proposed construction could include, for example, a simple instruction to begin the cleaning cycle.

We conclude that the ITC's claim construction was correct for several reasons. First, as the ITC found, "the plain and ordinary meaning of 'instructions' in this field is 'program or machine executable code.'" J.A. 55. This would, according to the ITC, require transmission of some form of program or application that communicates to the robot's processor what to do. There is no indication in the specification that the patentee intended to act as its own lexicographer to define "instructions" in a way inconsistent with its plain meaning.

Second, the specification contemplates that a mobile phone would transmit programming information. The summary of the invention begins by stating that "[t]he invention provides a method and apparatus for configuring a robotic device to operate according to a user defined schedule." '924 patent, col. 2, ll. 34–36. The specification explains that a "scheduling application program" can either be "pre-installed or [received from] a communication device" and that "upon a loading of a scheduling application program . . . a user can enable the robotic device to run autonomously according to the received scheduling information." *Id.* col. 4, ll. 48–51. The patent makes clear that "[t]he communication device can also be used to load configuration information such as a scheduling application program . . . such that the robotic device can run autonomously without further user input upon storing user define [sic] scheduling information." *Id.* col. 5, ll. 58–63. The specification elaborates at length about the sorts of "configuration information" that are transferred to the robotic vacuum. *See id.* col. 6, l. 20–col. 7, l. 11; *id.* col. 7, l. 53–col. 8, l. 4. Such "configuration information" can include, for example, "information 22 for upgrading the existing capabilities of the robotic device or reprogramming the device to carry out new tasks." *Id.* col. 6, ll. 37–40. "Further upgrading or reprogramming information 22 can include programs and applications allowing the robotic device to carry out completely new tasks . . . or 'learning' programs and

applications allowing the robotic device to adapt its own programming based on information gained through carrying out specified tasks." *Id.* col. 6, ll. 46–53.

Third, the parties agree that the "configuration information" discussed throughout the specification refers to information that programs the robotic device—i.e., communicates how the robotic device should work.[1] We therefore find it not insignificant that the claims also use the term "configured" when referring to the "instructions"

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[1]   The dissent suggests that "configuration" does not necessarily mean programming. Dissenting Op. 4–5. But the specification equates "configured" and "programmed," '924 patent, col. 7, l. 53–54, and the patentee itself distinguished configuration information from scheduling information and defines "configuration information" as "information that tells the robot *how* to work, and includes 'a scheduling application program' that allows the robot, once it receives and 'stor[es] user define[d] scheduling information,' to 'run autonomously without further user input,'" Blue Br. 6 (emphasis in original). The examples cited by the dissent do not suggest otherwise. The dissent points out that the term "configuration" is sometimes used to denote a physical arrangement, Dissenting Op. 5, but the specification is consistent in using "configured" and "configuration information" to mean "programmed" or "programming," *see, e.g.*, '924 patent, col. 6, ll. 37–40 ("The configuration information 12 can also include information 22 for upgrading the existing capabilities of the robotic device to carry out new tasks."); *id.* col. 7, ll. 57–58 ("The communication device 12 can also be configured to communicate scheduling information 16 to the robotic device."). *Compare id.* col. 10, ll. 65–67 ("In the system configuration 120 shown in FIG 6B, a mobile robotic device 104 is linked to a communication device 102 through a cable 122.").

transmitted to the robotic device. Though the language is somewhat different—the claims refer to "instructions configured," whereas the specification refers to "configuration information"—we conclude that use of the concept of "configuration" to refer to the "instructions" of the claims suggests that those "instructions" relate to programming the robotic vacuum; in other words, that the "instructions" transmitted comprise a "program or machine executable code."

Fourth, the specification makes clear that "instructions" are only a subset of "information," but that subset must be transmitted. Both the claims and the specification contemplate the transmission of scheduling information from the mobile device to the robotic vacuum that does not fall within the definition of "instructions." *See, e.g.*, *id.* Fig. 7 (depicting the transmission of "scheduling information" separate from the transmission of "configuration information"). But the claims require the transmission of "information <u>including</u> instructions," as well as other selected information. *Id.* col. 12, l. 57 (emphasis added); *accord id.* col. 13, ll. 40–41 ("information comprising instructions"). And the specification states that "[i]n various embodiments of the invention the transmitted information can include control and scheduling information, control and configuration information, or control, configuration, and scheduling information." *Id.* col. 3, ll. 50–53. In other words, "instructions" are a subset of "information," which must be included in the information transmitted from the mobile device to the robotic vacuum. Even though other "scheduling information" can be transmitted, which is not "instructions," the claims are not satisfied without communicating the "instructions" subset of such "information."

Finally, the claims are not designed to coincide with the broad scope of the specification. iRobot argues that the claims of the '924 patent must be understood to require transmission of "scheduling information" because the specification discloses embodiments wherein "scheduling

information," but not a "program or machine executable code," are transmitted to the robotic vacuum. The patentee, like the dissent, relies partly on Figure 7, which discloses, in some instances, the transmission of scheduling information absent the transmission of a program. *Id.* Fig. 7. But the fact that Figure 7 discloses embodiments where programming information is not transmitted is of no significance here. We are unconvinced that the claims must be coextensive with the specification. The '924 patent is a continuation of U.S. Patent Application No. 11/166,891 ("the '891 application"), which included claims of much broader scope than those at issue here. For example, the '891 application included one independent claim directed to only "communicating the scheduling information from the remote device to the robotic device," '891 application, cl. 6, and another directed to the transmission of "information" that comprises "at least <u>one of</u> configuring the robotic device and providing scheduling information for the robotic device," *id.* at cl. 11 (emphasis added). Given that the '924 patent and its parent application have an identical specification, and because the '891 application was filed with claims relating to a breadth of embodiments wherein the "information" transmitted to the robotic device is something other than a "program or machine executable code," we find no reason to construe the claims here such that they are coextensive with the specification.

CONCLUSION

Because we agree with the ITC's construction of the term "instructions," we hold that the ITC did not err in granting summary determination of non-infringement and dismissing the investigation as to the respondents. We therefore *affirm*.

AFFIRMED

COSTS

No costs.

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BRYSON, *Circuit Judge*, dissenting.

The technology in this case is not complex, and for the most part the patent is easy to parse. The problem resides principally in a single claim term, the word "instructions." Unfortunately, that term appears for the first time in the claims (except for two usages in an entirely different context in the specification), and the meaning of the term is therefore not immediately apparent. The International Trade Commission's administrative law judge construed

the claim to have the technical meaning of "software program or machine executable code," and this court today agrees with that construction. I would read the term as having a non-technical meaning such as "directions," "commands," or "orders." The difference leads to a different construction of independent claims 1 and 12 of the '924 patent and a difference in outcome for this appeal. I therefore respectfully dissent.

Independent claims 1 and 12 require a user to enter a command into a mobile phone that is "at least in part indicative of a schedule." Information is then sent from the phone to the cleaning robot. That information includes "instructions configured to cause a processor of the cleaning robot" to execute a cleaning operation. The "command" entered into the phone corresponds to the "instructions" sent by the phone to the robot.

Figure 7 of the '924 patent makes clear that it is not necessary that the "instructions" sent by the phone to the robot include a downloadable software program or application. Instead, the instructions can be a simple direction to begin the cleaning process or to do so at a particular time. Figure 7 notes that the communication device, such as a mobile phone, can load configuration information, such as a scheduling application, in the robotic device. *See* Fig. 7, step 146 ("Store Configuration Information (e.g., Scheduling Application) in Robotic Device"). That step is "[o]nly necessary," Figure 7 explains, if the pertinent configuration information is "not already installed" on the robotic device. Then, in separate steps, the user can enter scheduling information into the communication device (step 150), and that scheduling information can be transmitted to the robotic device (step 154), after which the robotic device can operate autonomously according to the scheduling information (step 158).

The best interpretation of Figure 7 and the portion of the specification that describes it ('924 patent, col. 11, line

42, through col. 12, line 28) is that the scheduling information is distinct from the scheduling application that is either already installed in the robot or is installed from the communication device before the entry of the "scheduling information." The specification explains that for a robotic device without a pre-installed scheduling application program, or a robotic device needing reprogramming, "the communication device can be used to load the required configuration information into the robotic device." '924 patent, col. 11, ll. 42-46. At that point, the robotic device is "ready for use." *Id.*, col. 11, ll. 53-54.

The next step, according to the specification, is that the communication device "can be used to provide scheduling information or direct control information into the robotic device." Id., col. 11, ll. 57-60. The scheduling information is then loaded and stored in the robotic device's memory, which enables the robotic device to "run autonomously, based on this stored scheduling information." *Id.*, col. 11, line 65, through col. 12, line 4.

Read in light of those portions of the specification, the claim limitation "instructions configured to cause a processor of the cleaning robot" to execute a cleaning operation is most naturally interpreted as referring to the scheduling information that is sent from the communication device to trigger the operation of the cleaning application that has previously been loaded into the robot.

The administrative law judge's construction of the term "instructions" is limited to a program or application that is downloaded from the mobile phone, which is referred to as "configuration information" in the patent. The administrative law judge's construction does not include signals that

simply direct the robot's processor to clean according to a schedule.[1]

That construction seems to me to be incorrect. All that is required by the claim language is that the information sent from the mobile phone to the robot's processor include "instructions configured to cause" the robot's processor to execute a cleaning operation. Absent any indication that the term "instructions" was being used as a term of art—and there is no such indication in the specification—the plain meaning of that claim limitation is that the message sent from the mobile phone must cause the robot to clean as directed by that message.

Obviously, the signal sent from the mobile phone must be in a form that can be understood by the processor. That is not to say, however, that the signal must be in the form of a "program" or an application. It can be as simple as a direction to clean "now," or to clean "according to the previously installed schedule," or to begin a cleaning cycle within a designated period of time.

The parties agree that the patent contemplates that the mobile phone can send programming information to the robot's processor. The question posed by the claim construction issue is whether the signals sent to the robot's processor must be in the form of programming information. In my view, the language of the claims and the relevant discussion in the specification indicate that they do not.

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[1]   Although the scope of the reference in the administrative law judge's opinion to "machine executable code" was not entirely clear, the Commission's lawyer acknowledged at oral argument that the administrative law judge used the term "machine executable code" in a restrictive sense, requiring that the mobile phone download a program or application to infringe.

The intervenor focuses on the use of the term "configured" in the phrase "instructions configured to cause a processor of the cleaning robot" to execute a cleaning operation. According to the intervenor, the use of that term invokes the term "configuration information" that is used in the specification to refer to information that configures the robot's processor by programming it. But the terms "configured" and "configuration" are used numerous times in the specification, not always in reference to the software programming or machine executable code. Throughout the specification, for example, the patent refers to the "configuration" of various components of the system, including the mobile phone, the mobile phone display, and the system as a whole. In those contexts, the term is not used to refer to programming or machine executable code. *See, e.g.*, '924 patent, col. 5, line 66, through col. 6, line 1 (referring to "one possible configuration of a combined scheduling tool and communication device"); *id.*, col. 10, ll. 19-21 (referring to a display on the mobile phone that is "configured to show information received from a robotic device"); *id.*, col. 10, ll. 31-32 (referring to user inputs that "are configured to provide direct control commands to a mobile robotic device"). Thus, it seems clear that the patent uses the term "configured" to refer to any arrangement of components that performs a particular function, and does not restrict the use of that term to software programs or machine executable code.

Even if the term "configured" is interpreted to mean "programmed," that does not mean that the "instructions" that are "configured to cause a processor of the cleaning robot to perform" a cleaning operation must consist of a program or application that is downloaded to the robot's processor. Sending programmed instructions is quite different from sending the program or application itself.

Because I interpret the contested claim language as applying to a system in which the command that is entered at the mobile phone and transmitted to the robot's

processor must simply direct the processor to cause the robot to execute a cleaning operation, I disagree with the claim construction adopted by the administrative law judge. I would therefore reverse the Commission's summary determination of non-infringement.