

Exhibit 33

Exhibit 33
Infringement Claim Chart for U.S. Patent No. 9,632,748 (“the ’748 patent”)

Sonos Products directly and/or indirectly infringe at least claims 1-4, 7, 9-12, 14, and 15 (“Asserted Claims”) of U.S. Patent No. 9,632,748 (“the ’748 patent”). The Sonos Products that infringe the ’748 patent include at least the Sonos Move, Sonos Roam, Sonos Arc, Sonos Beam, and Sonos One (collectively the “Accused Voice Products”).

The Accused Voice Products infringe the ’748 patent because they include systems, processors, and/or methods that support the Sonos Voice Control feature and for arbitrating between devices that detect a voice command, as claimed in the ’748 patent. Additionally, the Sonos One is representative of the Accused Voice Products at least because the other Accused Voice Products function in the same or substantially similar manner to the Sonos One. Sonos’ marketing, customer support, and other technical information describe the relevant aspects of Sonos Voice Control in the same way for all Sonos devices, including each of the Accused Voice Products.¹ Testing of multiple different Sonos devices further confirms that the Sonos Voice Control feature operates in the same or substantially similar manner on the different devices. Thus, on information and belief, the Sonos Voice Control functionality described in this chart for the Sonos One device implements the same code base (e.g., the Sonos S2 operating system) as the other Accused Voice Products to function in the same or substantially similar way for all products that support Sonos Voice Control, including each of the Accused Voice Products.

Google contends each of the following limitations is met literally, and, to the extent a limitation is not met literally, it is met under the doctrine of equivalents.

References:

- Sonos One, Sonos.com, <https://www.sonos.com/en-us/shop/one> (Ex. 23)
- Sonos Roam, Sonos.com, <https://www.sonos.com/en-us/shop/roam> (Ex. 24)
- Sonos Move, Sonos.com, <https://www.sonos.com/en-us/shop/move> (Ex. 25)
- Sonos Arc, Sonos.com, <https://www.sonos.com/en-us/shop/arc> (Ex. 26)
- Sonos Beam, Sonos.com, <https://www.sonos.com/en-us/shop/beam> (Ex. 27)
- Sonos User Guide, Sonos.com, <https://www.sonos.com/en-us/guides/sonossystem> (Ex. 28)
- Sonos One User Guide, Sonos.com, <https://www.sonos.com/en-us/guides/one> (Ex. 29)
- Sonos Voice Control User Guide, Sonos.com, <https://www.sonos.com/en-us/guides/sonosvoicecontrol> (Ex. 34)

¹ See Sonos Voice Control, Sonos.com, available at <https://www.sonos.com/en-us/sonos-voice-control>; Sonos Voice Control, Sonos Support, available at <https://support.sonos.com/s/topic/0TO8V000000HWlgWAG/sonos-voice-control>; “On-device voice control on Sonos speakers,” Sonos Tech Blog, available at <https://tech-blog.sonos.com/posts/on-device-voice-control-on-sonos-speakers/>.

- Control Sonos with Sonos Voice Control, Sonos Support, <https://support.sonos.com/s/article/5107> (Ex. 33)

Claims	Accused Voice Products
[1.pre] A method comprising:	The Accused Voice Products are designed to, and capable of, performing the claimed method. On information and belief, the Accused Voice Products are used by Sonos to perform the claimed method in the U.S. while testing and are performed by Sonos customers during normal operation of a multi-device Sonos environment. For example, the Sonos One device is a voice-enabled device that supports the Sonos Voice Control feature. 

	 © Sonos Voice Control Say to play Play music and control your system with hands-free ease and unmatched privacy. Learn more → See Sonos One, Sonos.com, https://www.sonos.com/en-us/shop/one. Each of the other Accused Voice Products also supports Sonos Voice Control. See https://www.sonos.com/en-us/shop/roam; https://www.sonos.com/en-us/shop/move; https://www.sonos.com/en-us/shop/arc; https://www.sonos.com/en-us/shop/beam.
[1.1] receiving, by a first computing device of a plurality of computing devices in physical proximity to one another, a spoken audio input that is also received by one	The Accused Voice Products are computing devices that are capable of being used within, and are designed for use within, a configuration containing a plurality of computing devices used in physical proximity to one another. The Accused Voice Products receive a spoken audio input that is also received by one or more additional computing devices of the plurality of computing devices. The Accused Voice Products are computing devices that can be placed into a system of a plurality of computing devices used in physical proximity to one another. <i>See, e.g.:</i>

or more additional computing devices of the plurality of computing devices;

The Sonos Sound System—

- Sonos is the wireless sound system that fills as many rooms as you want (up to 32) with music, movies and TV.
- Free **Sonos app** guides you through setup and provides system control for everyone in the house.
- Compatible with iOS, Android, Mac, and PC.
- Easily manage your system from any room.
- Mix and match products to build a home sound system that fits your lifestyle.

See Sonos User Guide, Sonos.com, <https://www.sonos.com/en-us/guides>.

For example, a user may speak commands to a Sonos One to trigger the device to perform certain activities through Sonos Voice Control.



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See Sonos One, Sonos.com, <https://www.sonos.com/en-us/shop/one>.



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Voice services

Use your voice to control your Sonos system with any voice-enabled Sonos product—play and control content, turn the volume up or down, and more.

- **Sonos Voice Control:** control your whole Sonos system with hands-free ease and unmatched privacy. Sonos Voice Control comes ready to use—it only takes a few seconds to add when you set up your speakers. [More information](#)
- **Amazon Alexa:** you'll need the Sonos app and the Alexa app with the Sonos skill enabled. You'll make some changes in both apps during setup. [Learn more](#)
- **Google Assistant:** you'll need the Sonos app and the Google Assistant app. You'll make some changes in both apps during setup. [Learn more](#)
- **Siri:** you'll need the Apple Home app. Add your AirPlay2-compatible Sonos speakers to the Apple Home app and then use an iPhone, iPad, or Apple TV to ask Siri to play music (currently limited to Apple Music). [Learn more](#)

See Sonos One User Guide, Sonos.com, <https://www.sonos.com/en-us/guides/one>.

Easy voice requests

Start the music, adjust the volume, pause, and move the sound all around your system without lifting a finger. Control your whole Sonos system with any voice-enabled Sonos product.

Just begin your request with "Hey Sonos..."

Common voice requests you can now make with Sonos Voice Control:

- "Hey Sonos, play a little quieter."
- "Hey Sonos, what's playing?"
- "Hey Sonos, pause."
- "Hey Sonos, play NPR."
- "Hey Sonos, turn the TV on."

See Sonos Voice Control User Guide, Sonos.com, <https://www.sonos.com/en-us/guides/sonosvoicecontrol>.

Testing of the Sonos One device in physical proximity to other Sonos devices further confirms that each of the devices receive the spoken audio input, including a wake word ("Hey Sonos") followed by a user command. For example, each Sonos One device that detects the wake word ("Hey Sonos") will transmit a "Feedback – RunningSession" message to nearby Sonos devices to establish a Sonos Voice Control session. See, e.g.:

```
{
  "message": "Feedback",
  "data": {
    "message": "RunningSession",
    "data": {
      "devices_ids": [
        "[REDACTED]",
        "[REDACTED]"
      ],
      "message_serial": "[REDACTED]"
    }
  }
}
```

Each of the Sonos devices in the session then transmits a “WakeWord” message to the other devices. The “WakeWord” messages include information that the devices utilize to determine which device should respond to the user’s command, including at least the “arbitration_metric” value. *See, e.g.,*:

```
{
  "message": "WakeWord",
  "data": {
    "serial": "[REDACTED]",
    "in_session": false,
    "arbitration_metric": 29.761623,
    "muse_household_id": "Sonos_[REDACTED]",
    "device_id": "RINCON_[REDACTED]",
    "message_serial": "[REDACTED]"
  }
}
```

	<pre> { "message": "WakeWord", "data": { "serial": "[REDACTED]", "in_session": false, "arbitration_metric": 30.515377, "muse_household_id": "Sonos [REDACTED]", "device_id": "RINCON [REDACTED]", "message_serial": "[REDACTED]" } } </pre> <pre> { "message": "WakeWord", "data": { "serial": "[REDACTED]", "in_session": false, "arbitration_metric": 31.513437, "muse_household_id": "Sonos [REDACTED]", "device_id": "RINCON [REDACTED]", "message_serial": "[REDACTED]" } } </pre> On information and belief, each of the Accused Voice Products supports the features described above in the same way, and therefore meet this limitation in the same manner as the exemplary products identified above.
[1.2] determining, by the first computing device and based at least in part on information received from the one or more additional computing devices, whether the first computing device should perform	The Accused Voice Products are designed to, and capable of, determining, based at least in part on information received from the one or more additional computing devices, whether the first computing device should perform speech recognition on the spoken audio input. The Accused Voice Products are capable of performing speech recognition on spoken audio inputs, using the Sonos Voice Control feature.

speech recognition
on the spoken audio
input; and



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Voice services

Use your voice to control your Sonos system with any voice-enabled Sonos product—play and control content, turn the volume up or down, and more.

- **Sonos Voice Control:** control your whole Sonos system with hands-free ease and unmatched privacy. Sonos Voice Control comes ready to use—it only takes a few seconds to add when you set up your speakers. [More information](#)
- **Amazon Alexa:** you'll need the Sonos app and the Alexa app with the Sonos skill enabled. You'll make some changes in both apps during setup. [Learn more](#)
- **Google Assistant:** you'll need the Sonos app and the Google Assistant app. You'll make some changes in both apps during setup. [Learn more](#)
- **Siri:** you'll need the Apple Home app. Add your AirPlay2-compatible Sonos speakers to the Apple Home app and then use an iPhone, iPad, or Apple TV to ask Siri to play music (currently limited to Apple Music). [Learn more](#)

See Sonos One User Guide, Sonos.com, <https://www.sonos.com/en-us/guides/one>.

Easy voice requests

Start the music, adjust the volume, pause, and move the sound all around your system without lifting a finger. Control your whole Sonos system with any voice-enabled Sonos product.

Just begin your request with "Hey Sonos..."

Common voice requests you can now make with Sonos Voice Control:

- "Hey Sonos, play a little quieter."
- "Hey Sonos, what's playing?"
- "Hey Sonos, pause."
- "Hey Sonos, play NPR."
- "Hey Sonos, turn the TV on."

See Sonos Voice Control User Guide, Sonos.com, <https://www.sonos.com/en-us/guides/sonosvoicecontrol>

On information and belief, the Accused Voice Products will compare the value of their own "arbitration_metric" (which was included in the WakeWord message that device sent) with the "arbitration_metric" values received in WakeWord messages from other devices in the Sonos Voice Control session. Testing confirms that the device that sends the highest arbitration_metric value will determine that it is the arbitration winner and will perform speech recognition on the spoken audio input from the user. See, e.g.:

	<pre> { "message": "WakeWord", "data": { "serial": "[REDACTED]", "in_session": false, "arbitration_metric": 29.761623, "muse_household_id": "Sonos [REDACTED]", "device_id": "RINCON [REDACTED]", "message_serial": "[REDACTED]" } } </pre> <pre> { "message": "WakeWord", "data": { "serial": "[REDACTED]", "in_session": false, "arbitration_metric": 30.515377, "muse_household_id": "Sonos [REDACTED]", "device_id": "RINCON [REDACTED]", "message_serial": "[REDACTED]" } } </pre> <pre> { "message": "WakeWord", "data": { "serial": "[REDACTED]", "in_session": false, "arbitration_metric": 31.513437, "muse_household_id": "Sonos [REDACTED]", "device_id": "RINCON [REDACTED]", "message_serial": "[REDACTED]" } } </pre> On information and belief, each of the Accused Voice Products supports the features described above in the same way, and therefore meet this limitation in the same manner as described above.
[1.3] responsive to determining that the first computing	The Accused Voice Products are designed to, and capable of, responding to a determination that they should perform speech recognition on spoken audio input.

device should perform speech recognition on the spoken audio input:	For example, after determining that it is the arbitration winner based on the comparison of its own “arbitration_metric” with the “arbitration_metric” values received from other devices, the Sonos One will continue to transmit “Feedback-RunningSession” messages to the other devices in the Sonos Voice Control session, while the other devices will not send further messages for that session: <pre> { "message": "Feedback", "data": { "message": "RunningSession", "data": { "devices_ids": ["[REDACTED]", "[REDACTED]"], "message_serial": "[REDACTED]" } } } </pre> Testing confirms that the device that wins arbitration will also respond to the user’s command. On information and belief, each of the Accused Voice Products supports the features described above in the same way, and therefore meet this limitation in the same manner as described above.
[1.3.1] sending, by the first computing device and to at least a second computing device from the plurality of computing devices, a command to temporarily refrain	The Accused Voice Products are designed to, and capable of, sending a command to at least a second computing device from the plurality of computing devices, a command to temporarily refrain from performing speech recognition. For example, the device that wins arbitration will transmit a “WakeWord” message and will continue to transmit “Feedback-RunningSession” messages to the other devices in the Sonos Voice Control session, while the other devices will not send further messages for that session:

from performing speech recognition;	<pre>{ "message": "WakeWord", "data": { "serial": "[REDACTED]", "in_session": false, "arbitration_metric": 31.513437, "muse_household_id": "Sonos [REDACTED]", "device_id": "RINCON [REDACTED]", "message_serial": "[REDACTED]" } }</pre> <pre>{ "message": "Feedback", "data": { "message": "RunningSession", "data": { "devices_ids": ["[REDACTED]", "[REDACTED]"], "message_serial": "[REDACTED]" } } }</pre> The device that wins arbitration will also respond to the user's command. On information and belief, the winning device sends a message to one or more non-winning devices that cause those non-winning devices to temporarily refrain from performing speech recognition. On information and belief, each of the Accused Voice Products supports the features described above in the same way, and therefore meet this limitation in the same manner as described above.
[1.3.2] performing, by the first computing device, speech recognition	The Accused Voice Products are designed to, and capable of, performing speech recognition on the spoken audio input.

on the spoken audio input;

For example, the Accused Voice Products are capable of performing speech recognition on spoken audio inputs, using the Sonos Voice Control feature.



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- **Siri:** you'll need the Apple Home app. Add your AirPlay2-compatible Sonos speakers to the Apple Home app and then use an iPhone, iPad, or Apple TV to ask Siri to play music (currently limited to Apple Music). [Learn more](#)

See Sonos One User Guide, Sonos.com, <https://www.sonos.com/en-us/guides/one>.

	Easy voice requests Start the music, adjust the volume, pause, and move the sound all around your system without lifting a finger. Control your whole Sonos system with any voice-enabled Sonos product. Just begin your request with "Hey Sonos..." Common voice requests you can now make with Sonos Voice Control: • "Hey Sonos, play a little quieter." • "Hey Sonos, what's playing?" • "Hey Sonos, pause." • "Hey Sonos, play NPR." • "Hey Sonos, turn the TV on." See Sonos Voice Control User Guide, Sonos.com, https://www.sonos.com/en-us/guides/sonosvoicecontrol On information and belief, each of the Accused Voice Products supports the features described above in the same way, and therefore meet this limitation in the same manner as described above.
[1.3.3] determining, by the first computing device, based on performing speech recognition on the spoken audio input, whether the spoken audio input includes a predetermined	The Accused Voice Products are designed to, and capable of, determining, based on performing speech recognition on the spoken audio input, whether the audio input includes a predetermined spoken audio command. For example, the Sonos Voice Control feature allows a user to make various predetermined audio commands, such as "play music," "turn the TV on," etc. See, e.g.:

spoken audio command; and	Easy voice requests Start the music, adjust the volume, pause, and move the sound all around your system without lifting a finger. Control your whole Sonos system with any voice-enabled Sonos product. Just begin your request with "Hey Sonos..." Common voice requests you can now make with Sonos Voice Control: • "Hey Sonos, play a little quieter." • "Hey Sonos, what's playing?" • "Hey Sonos, pause." • "Hey Sonos, play NPR." • "Hey Sonos, turn the TV on." <i>See</i> Sonos Voice Control User Guide, Sonos.com, https://www.sonos.com/en-us/guides/sonosvoicecontrol. On information and belief, each of the Accused Voice Products supports the features described above in the same way, and therefore meet this limitation in the same manner as described above.
[1.3.4] responsive to determining that the spoken audio input includes the predetermined spoken audio command, executing, by the first computing device, an action associated with the	The Accused Voice Products are designed to, and capable of, responsive to determining that the spoken audio input includes the predetermined spoken audio command, executing an action associated with the predetermined spoken audio command. For example, the Sonos Voice Control feature allows a user to make a variety of predetermined requests, including playing music, adjusting volume, etc. <i>See, e.g.:</i>

predetermined spoken audio command.	Types of requests Sonos Voice Control can act on a variety of requests from music control to library management. You can ask Sonos to play a specific track, artist, or album, as well as adjust the volume, pause music, or skip tracks. You can also group and ungroup rooms with a voice request, or move music from one room to another. <i>See</i> Control Sonos With Voice Control, Support.sonos.com, https://support.sonos.com/s/article/5107. On information and belief, each of the Accused Voice Products supports the features described above in the same way, and therefore meet this limitation in the same manner as described above.
[7.pre]: A first computing device comprising: at least one processor; and at least one module operable by the at least one processor to:	The Accused Voice Products are computing devices that comprising at least one processor; and at least one module operable by the at least one processor to carry out the functionality recited in claim 7. The Sonos website explains in the Sonos One FAQ that the Sonos One Gen 2 contains an updated processor. <i>See, e.g.,</i> Sonos One, Sonos.com, https://www.sonos.com/en-us/shop/one. How is Sonos One Gen 2 different from the original version? Gen 2 has an updated processor, Bluetooth Low Energy (BLE) and increased memory. The Sonos website specifies that the Arc contains a 1.4 GHz A-53 Quad Core Central Processing Unit (“CPU”). <i>See</i> Sonos Arc, Sonos.com, https://www.sonos.com/en-us/shop/arc.

	 CPU Quad Core 1.4 GHz A-53 The Sonos website also specifies that the Roam contains a 1.4 GHz A-53 Quad Core Quad Core Central Processing Unit (“CPU”). <i>See</i> Sonos Roam, Sonos.com, https://www.sonos.com/en-us/shop/roam. CPU Quad Core 1.4 GHz A-53 On information and belief, each of the Accused Voice Products includes at least one processor and at least one module operable by that processor.
[7.1]: receive a spoken audio input that is also received by one or more additional computing devices in physical proximity to the first computing device;	The Accused Voice Products receive a spoken audio input that is also received by one or more additional computing devices in physical proximity to the first computing device. <i>See supra</i> limitation [1.1].

[7.2]: determine, based at least in part on information received from the one or more additional computing devices, whether the first computing device should perform speech recognition on the spoken audio input; and	The Accused Voice Products determine, based at least in part on information received from the one or more additional computing devices, whether the first computing device should perform speech recognition on the spoken audio input. <i>See supra</i> limitation [1.2].
[7.3]: responsive to determining that the first computing device should perform speech recognition on the spoken audio input:	The Accused Voice Products respond to a determination that they should perform speech recognition on spoken audio input. <i>See supra</i> limitation [1.3].

[7.3.1]: send, to at least a second computing device from a plurality of computing devices, a command to temporarily refrain from performing speech recognition;	The Accused Voice Products send to at least a second computing device from the plurality of computing devices, a command to temporarily refrain from performing speech recognition. <i>See supra</i> limitation [1.3.1].
[7.3.2]: perform speech recognition on the spoken audio input;	The Accused Voice Products perform speech recognition on the spoken audio input. <i>See supra</i> limitation [1.3.2].
[7.3.3]: determine, based on performing speech recognition on the spoken audio input, whether the spoken audio input includes a predetermined spoken audio command; and	The Accused Voice Products determine, based on performing speech recognition on the spoken audio input, whether the audio input includes a predetermined spoken audio command. <i>See supra</i> limitation [1.3.3].
[7.3.4]: responsive to determining that the spoken audio input includes the predetermined spoken audio command, execute	The Accused Voice Products, responsive to determining that the spoken audio input includes the predetermined spoken audio command, execute an action associated with the predetermined spoken audio command. <i>See supra</i> limitation [1.3.4].

an action associated with the predetermined spoken audio command.	

[11.pre] A non-transitory computer-readable storage medium encoded with instructions that, when executed, cause at least one processor of a first computing device to:	The Accused Voice Products each include a memory storing programs for execution by a processor of the device, the programs comprising instructions that, when executed, cause at least one processor to perform the steps of claim 11. <i>See supra</i> limitation [7.pre].
[11.1] receive a spoken audio input that is also received by one or more additional computing devices in physical proximity to the first computing device;	The Accused Voice Products are computing devices that can be placed into a system of a plurality of computing devices used in physical proximity to one another. The Accused Voice Products receive a spoken audio input that is also received by one or more additional computing devices of the plurality of computing devices. <i>See supra</i> limitation [1.1].
[11.2] determine, based at least in part on information received from the one or more additional computing devices,	The Accused Voice Products determine, based at least in part on information received from the one or more additional computing devices, whether the first computing device should perform speech recognition on the spoken audio input. <i>See supra</i> limitation[1.2].

whether the first computing device should perform speech recognition on the spoken audio input; and	
[11.3] responsive to determining that the first computing device should perform speech recognition on the spoken audio input:	The Accused Voice Products respond to a determination that they should perform speech recognition on spoken audio input. <i>See supra</i> limitation [1.3].
[11.3.1] send, to at least a second computing device from a plurality of computing devices, a command to temporarily refrain from performing speech recognition;	The Accused Voice Products send a command to at least a second computing device from the plurality of computing devices, a command to temporarily refrain from performing speech recognition. <i>See supra</i> limitation [1.3.1].
[11.3.2] perform speech recognition on the spoken audio input;	The Accused Voice Products perform speech recognition on the spoken audio input. <i>See supra</i> limitation [1.3.2].
[11.3.3] determine, based on performing speech recognition on the spoken audio	The Accused Voice Products determine, based on performing speech recognition on the spoken audio input, whether the audio input includes a predetermined spoken audio command. <i>See supra</i> limitation [1.3.3].

input, whether the first audio input includes a predetermined spoken audio command; and	
[11.3.4] responsive to determining that the spoken audio input includes the predetermined spoken audio command, execute an action associated with the predetermined spoken audio command.	The Accused Voice Products, responsive to determining that the spoken audio input includes the predetermined spoken audio command, execute an action associated with the predetermined spoken audio command. <i>See supra</i> limitation [1.3.4].