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Display and Voice-free Gesture-based Sleep Timer Control

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ABSTRACT

Interaction with a computing device often causes the device to emit light, e.g., when the interaction causes a turned-off device screen to turn on, or audio, e.g., when the interaction causes an audible beep or other output from the device. Such light or audio emissions are undesirable in certain situations, e.g., when extending a sleep timer. This disclosure provides a voice-free gesture-based sleep timer control that enables extending a sleep timer without light or sound emissions from a device that is performing audio playback. The described techniques can also be used to detect user gestures that are mapped to specific tasks to be performed by the device.

KEYWORDS

- Sleep timer
- Snooze
- Knock gesture
- Voice-free control
- Music playback
- Audiobook
- Smart display
- Smart speaker

BACKGROUND

Users often listen to audio such as music or an audiobook near bedtime using devices such as a smartphone, tablet, e-reader, smart speaker/display, or other device that is in the user's proximity. Oftentimes, users start audio playback and set a sleep timer that pauses

playback and turns off the device after a certain time, e.g., half an hour. Such playback typically occurs in a dark, otherwise quiet room with the lights turned off.

However, if the user wishes to continue listening, the user needs to pick up the device and interact with a user interface to extend the sleep timer. Such interaction may cause light emission due to the screen switching on to show the user interface and/or sound emission, e.g., a beep or other response from the device providing confirmation of the extension of the sleep timer. Such interaction can disturb others in the room who may already be asleep.

DESCRIPTION

This disclosure provides a voice-free gesture-based sleep timer control that enables extending a sleep timer without light or sound emissions from a device that is performing audio playback.

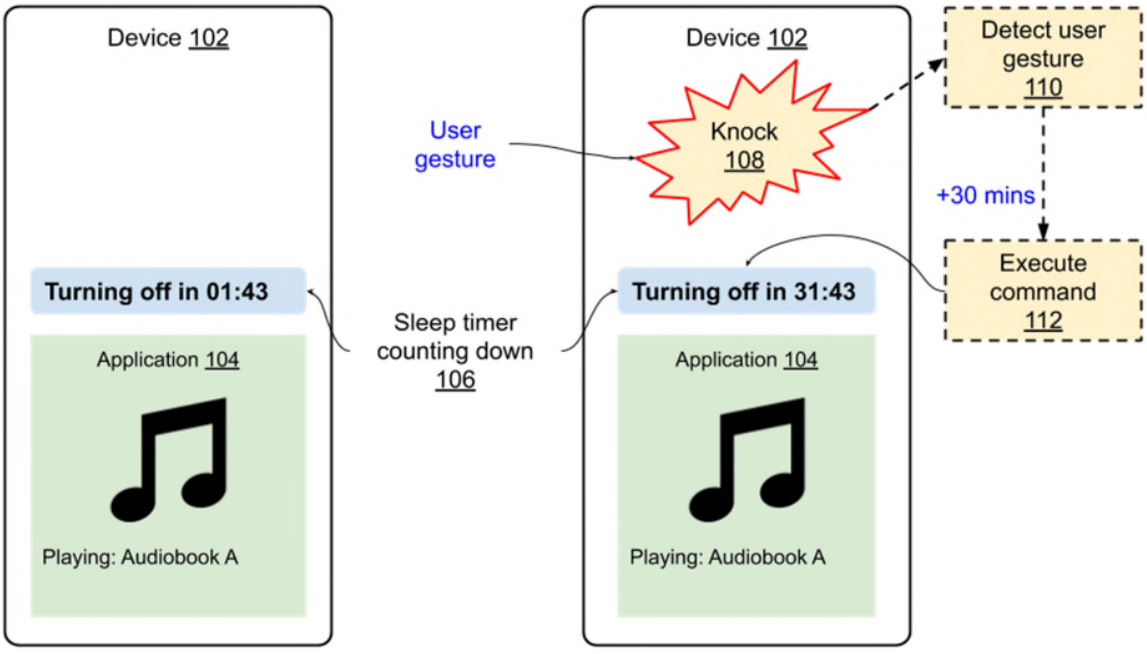

Fig. 1: Increasing the sleep timer of a music application by knocking on a user device

Fig. 1 illustrates an example operational implementation of the techniques of this disclosure. In this example, an audiobook application (104) is in use on a user device (102) providing audio playback of "Audiobook A." As illustrated in the left-side image of Fig. 1, the user has set a timer (106) to stop the audio playback after a certain time. In this example, the time left till the playback is stopped is 1 minute and 43 seconds.

As the timer nears expiration or upon expiry, the user may want to continue the playback. As illustrated in the right-side image of Fig. 1, per techniques of this disclosure, the user can perform a gesture, e.g., a (noiseless) knock (108) on the touchscreen of the device. The user gesture is detected (110) using available device sensors, e.g., accelerometer, gyroscope, etc. The knock is processed, and a command is executed (112) based on predefined rules. In the example of Fig. 1, the detection of the knock is translated to an extension of the sleep timer by 30 seconds, as illustrated by the remaining time now totaling to 31 minutes and 43 seconds.

While the example above illustrates a knock gesture, any gesture that can be detected via an on-device sensor can be utilized. Further, while the foregoing example illustrates an audio book playback example, the gesture-based extension of time can be used in other contexts as well.

For example, a user reads a recipe on a tablet (or smart display) placed on the kitchen counter while kneading the dough with both hands. The device is set to automatically turn off the screen after some time, e.g., 5 minutes. In such a situation, the user may knock on the kitchen counter and such a gesture can be detected to keep the display on for longer. Further, various gestures can be used for managing applications or device settings. For example, the user may hold a device and wave it to increase a sleep timer or to resume an application. In

another example, multiple consecutive knocks or waves of the device can be detected and mapped to specific application commands.

The techniques described herein enable users to interact with electronic devices without touching the screen (which requires lighting up the screen) or spoken input (which may disturb others and provoke an audible response from the device). In other, the described techniques enable silent interaction with a device for tasks such as extending a sleep timer that allows such tasks to be performed without disturbing others.

Further to the descriptions above, a user is provided with controls allowing the user to make an election as to both if and when systems, programs, or features described herein may enable collection of user information (e.g., information from sensors of a user device, a user's current location), and if the user is sent content or communications from a server (e.g., risk map). In addition, certain data are treated in one or more ways before it is stored or used, so that personally identifiable information is removed. For example, a user's identity is treated so that no personally identifiable information can be determined for the user. Thus, the user has control over what information is collected about the user, how that information is used, and what information is provided to the user.

CONCLUSION

This disclosure's techniques relate to a display and voice-free gesture-based sleep timer control in a portable electronic device, such as mobile phones, smartphones, electronic book readers, and tablets. A user can extend the sleep timer of a software application, such as audiobooks and music applications, on a user device through user gestures, such as knocking, waving the user device, and so on. Sensor signals from device sensors such as accelerometer and gyroscope are processed to translate into a user gesture, and a corresponding command is

executed based on predefined rules. Thus, the techniques of this disclosure enable a user to extend a sleep timer or other application settings of an application without interaction with the device User Interface or a digital assistant. In conclusion, the techniques help to avoid displaying light and sound distractions while making navigation more straightforward and quicker through application/device settings.

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