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(54) **PROVIDING ENHANCED HAPTIC FEEDBACK EFFECTS**

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(57) **ABSTRACT**

Method and apparatus for providing high strength, low frequency tactile sensations using an inertial actuator in a haptic feedback interface device, such as an actuator driving an oscillating inertial mass. A commanded low frequency is modulated or combined with a higher frequency at which the tactile sensations feel stronger, where the resulting signal is used to output a tactile sensation at the higher frequency and convey the commanded low frequency to the user. One embodiment provides higher frequency pulse bursts at the desired low frequency; other embodiments modulate or otherwise vary the amplitude of the higher frequency signal according to the desired low frequency.

(73) Assignee: **Immersion Corporation**

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