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(54) **SYNCHRONIZED VIBRATION DEVICE FOR HAPTIC FEEDBACK**

Publication Classification

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(51) **Int. Cl.**
G08B 6/00 (2006.01)

(52) **U.S. Cl.** **340/4.2**

(73) Assignee: **Coactive Drive Corporation**, New York, NY (US)

(57) **ABSTRACT**

(21) Appl. No.: **13/030,663**

The present invention relates to synchronized vibration devices that can provide haptic feedback to a user. A wide variety of actuator types may be employed to provide synchronized vibration, including linear actuators, rotary actuators, rotating eccentric mass actuators, and rocking mass actuators. A controller may send signals to one or more driver circuits for directing operation of the actuators. The controller may provide direction and amplitude control, vibration control, and frequency control to direct the haptic experience. Parameters such as frequency, phase, amplitude, duration, and direction can be programmed or input as different patterns suitable for use in gaming, virtual reality and real-world situations.

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Related U.S. Application Data

(63) Continuation of application No. 11/476,436, filed on Jun. 27, 2006, now Pat. No. 7,919,945.

(60) Provisional application No. 60/694,468, filed on Jun. 27, 2005.

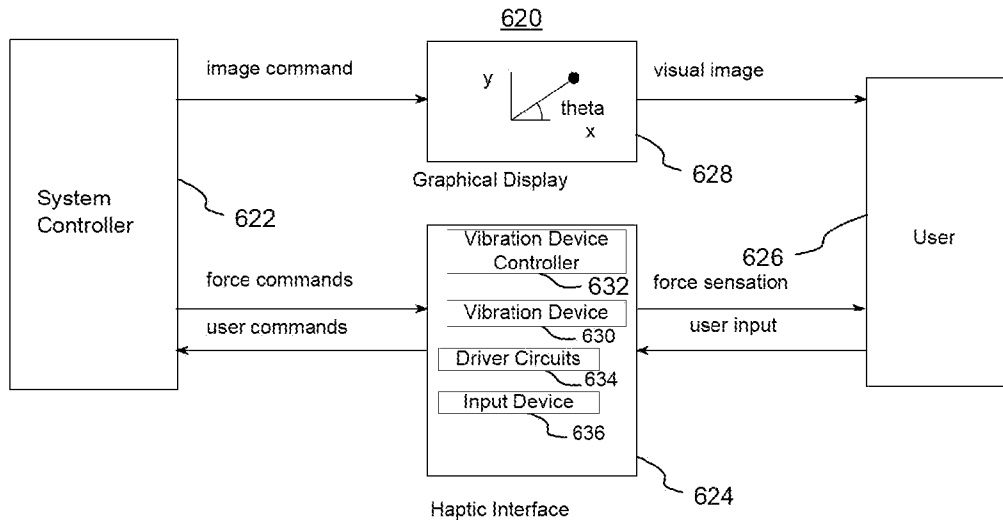


FIG. 1 10

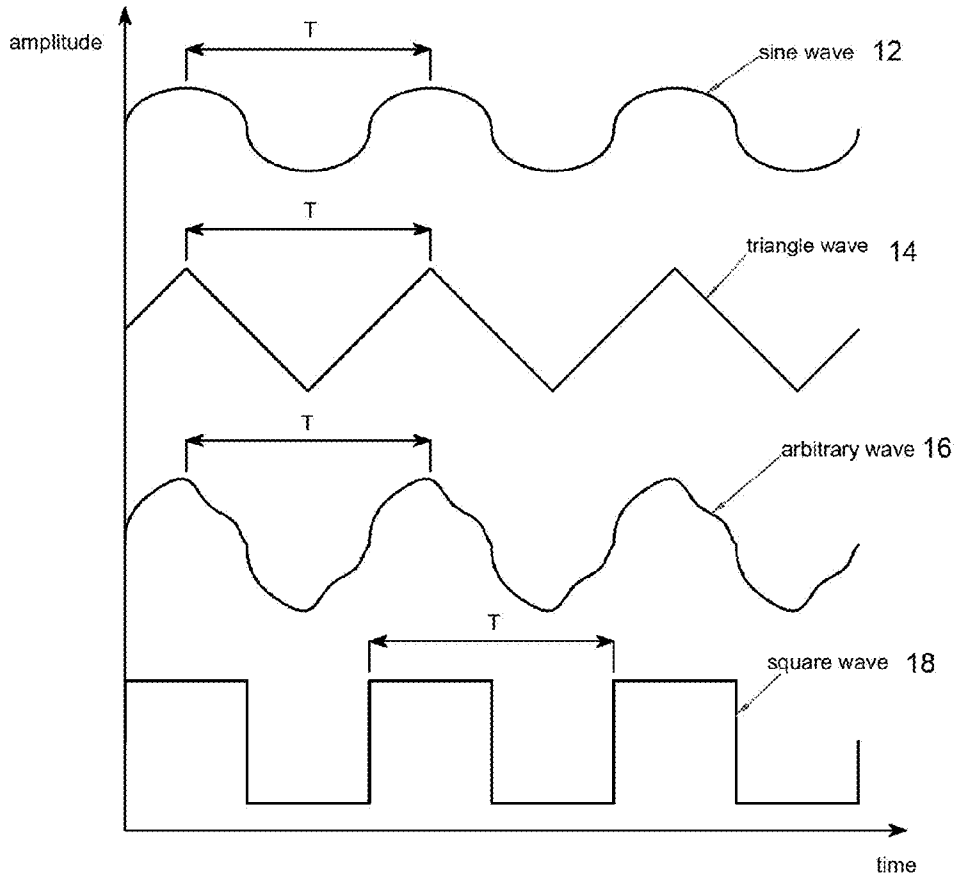
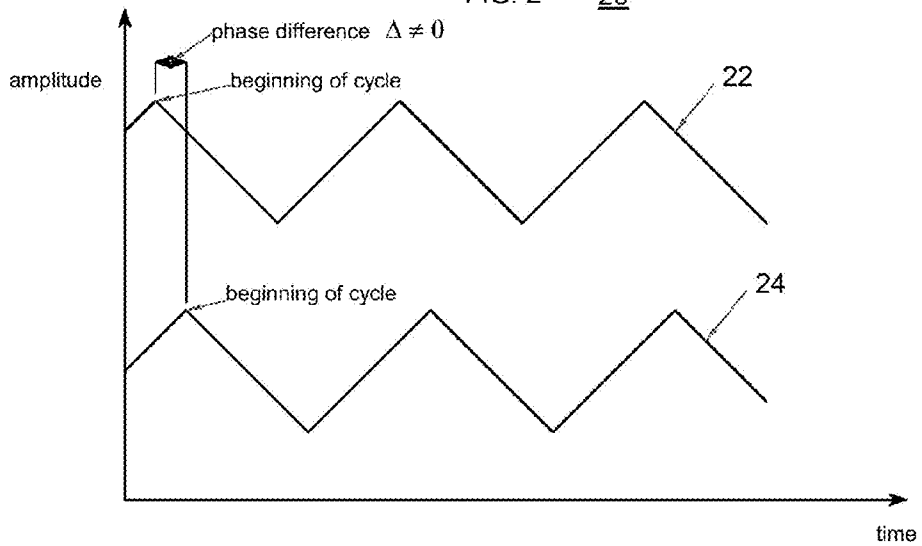


FIG. 2 20



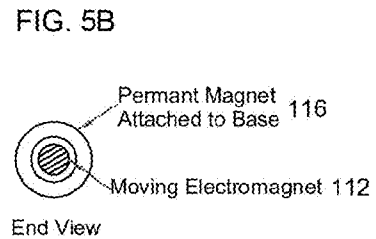
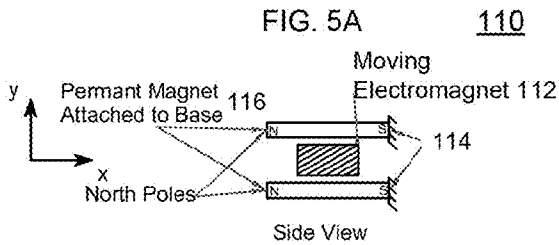
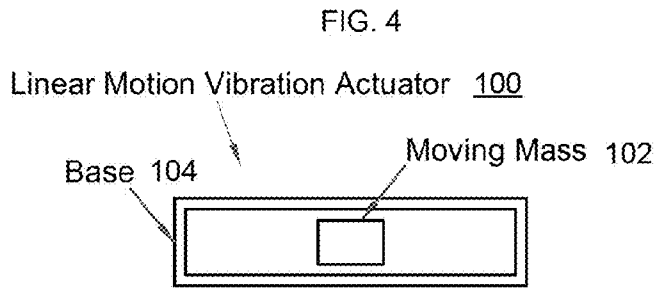
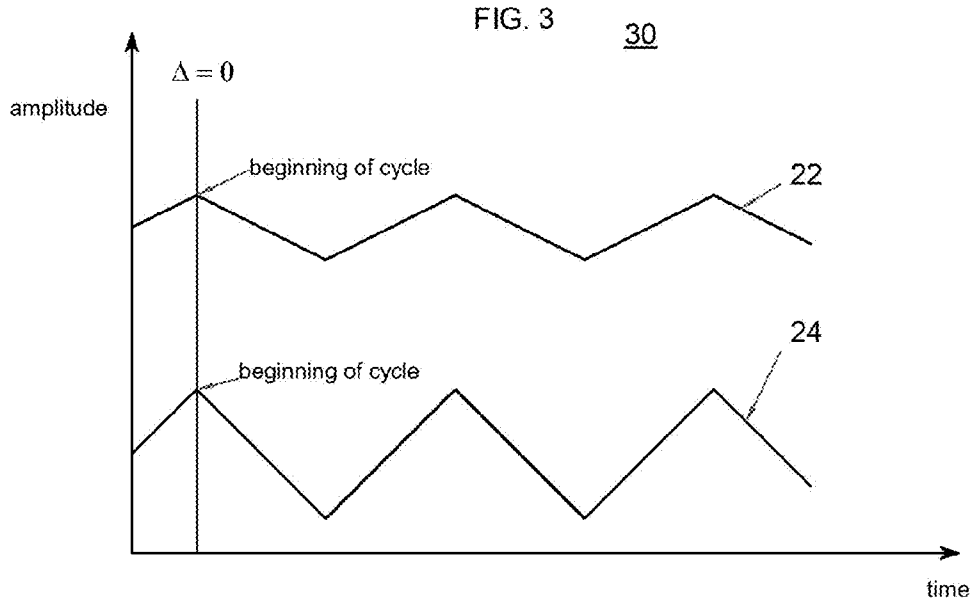


FIG. 6A 120

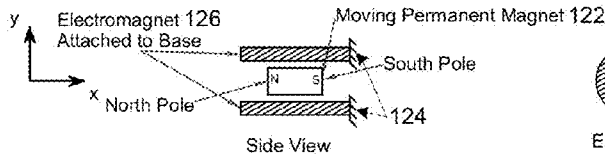


FIG. 6B

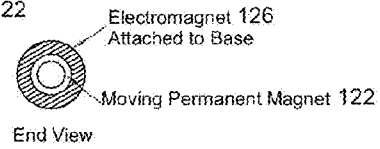


FIG. 7A 130

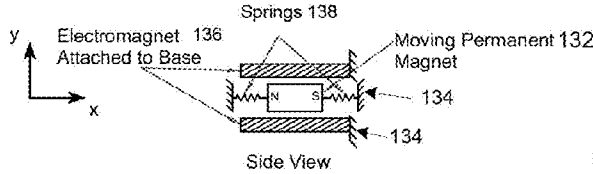


FIG. 7B

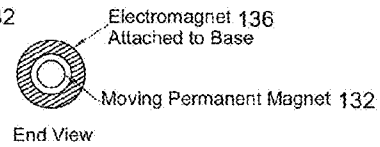


FIG. 8A 140

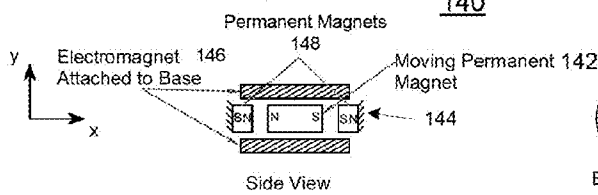


FIG. 8B

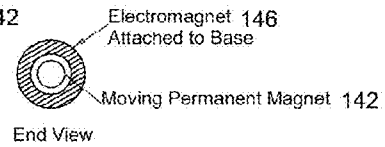


FIG. 9 150

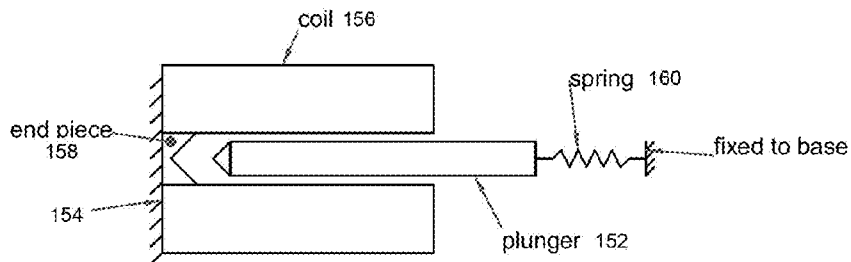


FIG. 10

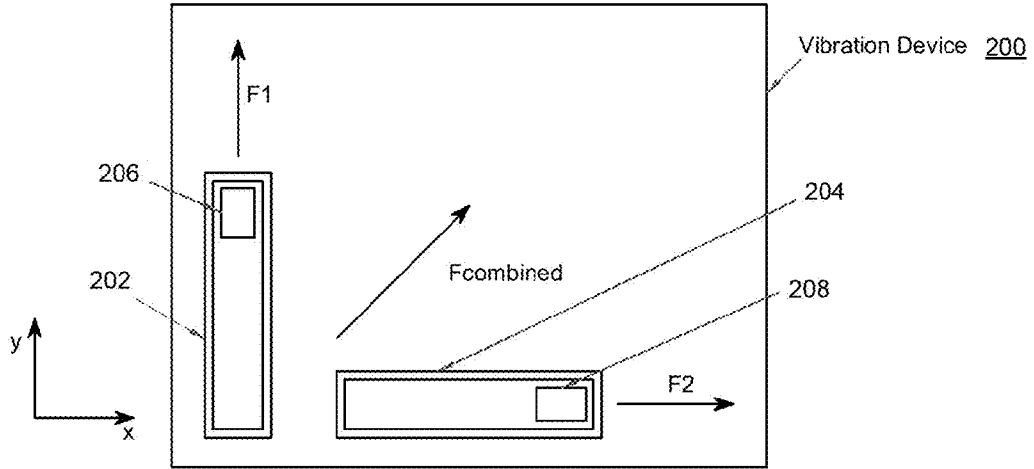
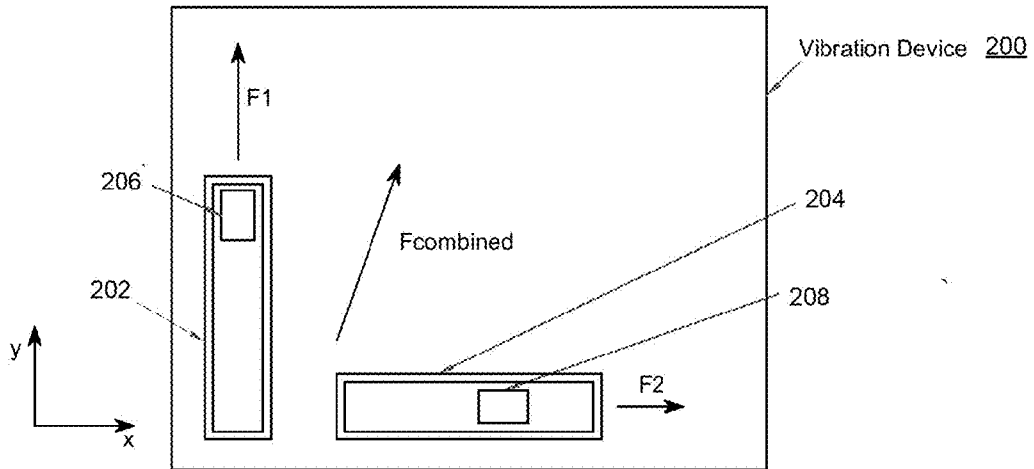


FIG. 11



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