mers (EAP), voice coil transducers or other electromagnetic device, or resonant eccentric rotating mass (HERM) devices.

[0061] While various embodiments have been described above, it should be understood that they have been presented by way of example only, and not limitation. Thus, the breadth and scope of should not be limited by any of the above-described embodiments, but should be defined only in accordance with the following claims and their equivalence.

[0062] The previous description of the embodiments is provided to enable any person skilled in the art to make or use the embodiments. While various electro-mechanical transducers have been described including at least one electro-mechanical device including a piezoelectric substance, various other electro-mechanical devices may be utilized that can be configured to operate in multiple operational modes, each one of the multiple operational modes including a number of resonant modes. Other modifications to the overall structure of the electro-mechanical devices and arrangement of the selector-mechanical transducers can be made without departing from the spirit and scope of the embodiments.

What is claimed is:

1. An electronic device comprising:
a housing;
a base coupled to the housing; and
an electro-mechanical transducer coupled to the base, the electro-mechanical transducer configured to operate in a resonant mode and output a haptic effect upon receiving a drive signal at a predetermined drive frequency.

2. The electronic device of claim **1**, wherein the housing is of a mobile telephone device.

3. The electronic device of claim **1**, wherein the housing is of a video game controller.

4. The electronic device of claim **1**, wherein the base imparts the haptic effect to the housing such that a user grasping the housing feels the haptic effect.

5. The electronic device of claim **1**, wherein the electro-mechanical transducer further comprises a plurality of electro-mechanical devices arranged in a parallel fashion with respect to the base, each electro-mechanical device including a piezoelectric bar and a mass coupled to the piezoelectric bar, the mass of each electro-mechanical device located a respective predetermined distance from the base.

6. The electronic device of claim **1**, wherein the electro-mechanical transducer further comprises a plurality of spaced apart electro-mechanical devices coupled thereto in a serial fashion between a first end proximal to the base and a second end distal to the base.

7. An electronic device comprising:
a housing;
a base coupled to the housing; and
a plurality of electro-mechanical transducers coupled to the base, each electro-mechanical transducer configured to operate in its respective resonant mode and output a respective haptic effect upon receiving a drive signal having a predetermined drive frequency.

8. The electronic device of claim **7** wherein each electro-mechanical transducer further comprises an electro-mechanical device having a piezoelectric bar and a mass coupled to the piezoelectric bar, the mass of each electro-mechanical device located a predetermined distance from the base.

9. The electronic device of claim **8** wherein at least one mass is located a different predetermined distance from the base than a mass of another electro-mechanical device in the plurality.

10. The electronic device of claim **8** wherein at least one mass has a weight different than a mass of another electro-mechanical device in the plurality.

11. The electronic device of claim **7** wherein the drive frequency of the drive signal applied to two or more of the electro-mechanical transducers in the plurality has a substantially same value.

12. The electronic device of claim **7** wherein the drive frequency of the drive signal applied to at least one electro-mechanical transducer in the plurality is at a higher order of the resonant frequency of another electro-mechanical transducer in the plurality.

13. The electronic device of claim **7** wherein at least one of the electro-mechanical transducer includes a plurality of spaced apart electro-mechanical devices coupled thereto in a serial fashion between a first end proximal to the base and a second end distal to the base.

14. A method of outputting haptic effects from an electronic device, the method comprising:
coupling a plurality of electro-mechanical transducers to a base in a housing, wherein each electro-mechanical transducer has an electro-mechanical device coupled thereto, each electro-mechanical transducer capable of operating at a respective resonant mode; and
applying a drive signal at a predetermined drive frequency to at least one electro-mechanical transducer in the plurality to output a haptic effect therefrom.

15. The method of claim **14** wherein each electro-mechanical device of the plurality further comprises a piezoelectric bar having a mass coupled thereto, the mass of each electro-mechanical device located a predetermined distance from the base.

16. The method of claim **15** wherein at least one mass is located a different distance from the base than a mass of another electro-mechanical device in the plurality.

17. The method of claim **15** wherein at least one mass has a weight different than a mass of another electro-mechanical device in the plurality.

18. The method of claim **15** the drive frequency of the drive signal applied to two or more of the electro-mechanical transducers in the plurality has a substantially same value.

19. The method of claim **15** wherein the drive frequency applied to at least one electro-mechanical transducer of the plurality is at a higher order of the resonant frequency of another electro-mechanical transducer in the plurality.

20. The method of claim **14** wherein at least one of the electro-mechanical transducers includes a plurality of spaced apart electro-mechanical devices coupled thereto in a serial fashion between a first end proximal to the base and a second end distal to the base.

21. The method of claim **14** further comprising:
selectively applying the drive signal to a first electro-mechanical transducer and a second electro-mechanical transducer to operate the first and second electro-mechanical transducers at their respective resonant mode frequencies in a first operational mode to collectively output a first haptic effect; and
selectively applying the drive signal to the first electro-mechanical transducer and a third electro-mechanical transducer to operate the first and third electro-mechanical transducers at their respective resonant mode frequencies in a second operational mode to collectively output a second haptic effect.

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