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(54) **INTEGRATED INPUT ROLLER HAVING A ROTARY MASS ACTUATOR**

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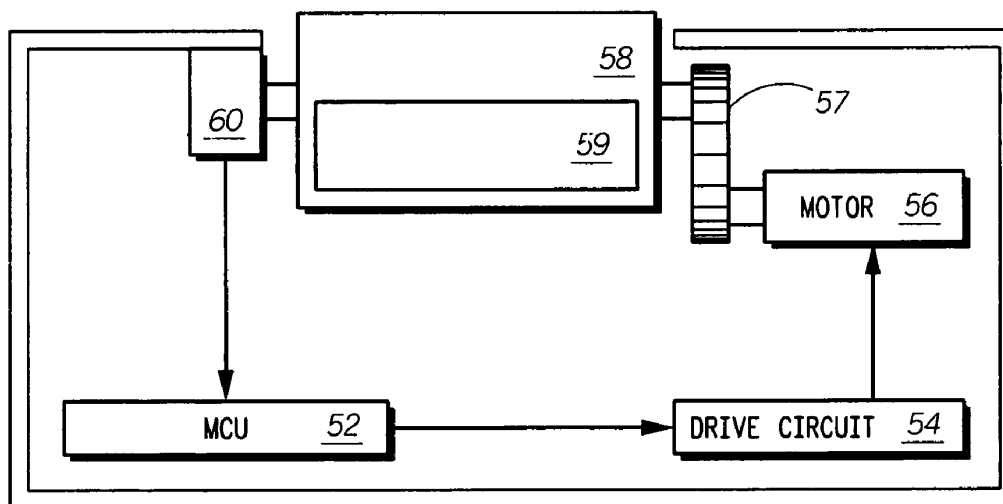
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(57) **ABSTRACT**

An input roller device (50) includes a roller (58), an eccentric rotating mass (59) within the roller, a drive mechanism (54, 56 and 57) causing the eccentric rotating mass to rotate within the roller, and a processor (52) coupled to the drive mechanism. The drive mechanism can also optionally include a drive link (57) if not directly driven by the shaft of the motor. The input roller device 50 can further include a rotary encoder (60) coupled to the processor on a rotation of the roller. Note, the processor can be programmed to cause the input roller to provide a varied tactile feedback to the user to correspond to different events or to cause the input roller to provide a rolling resistance that varies in coordination with inputs from a user interface.



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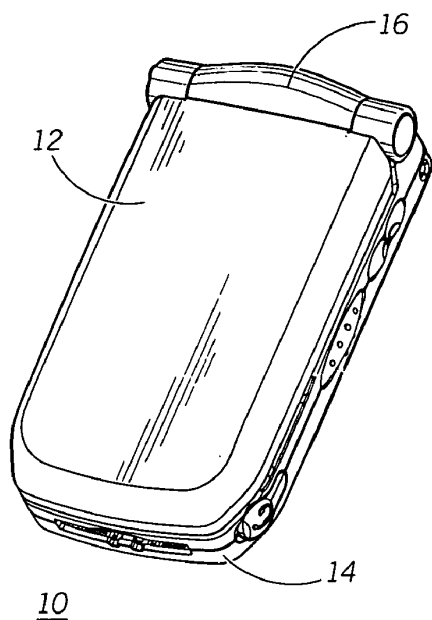


FIG. 1

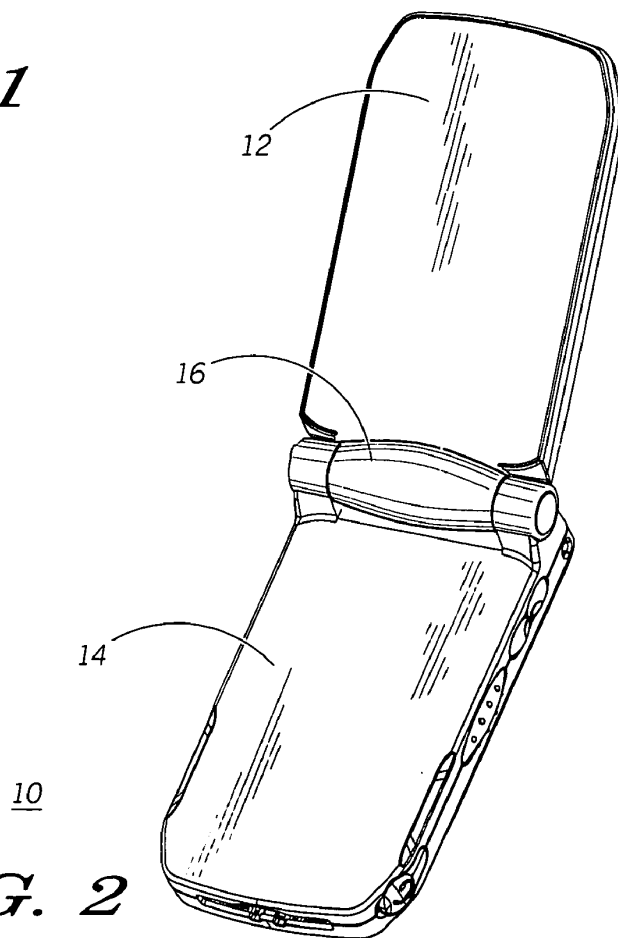
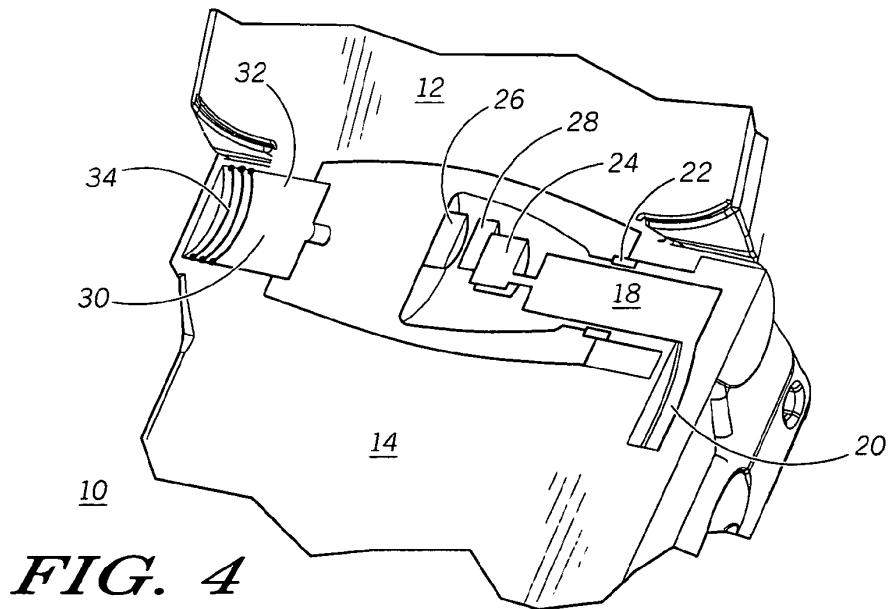
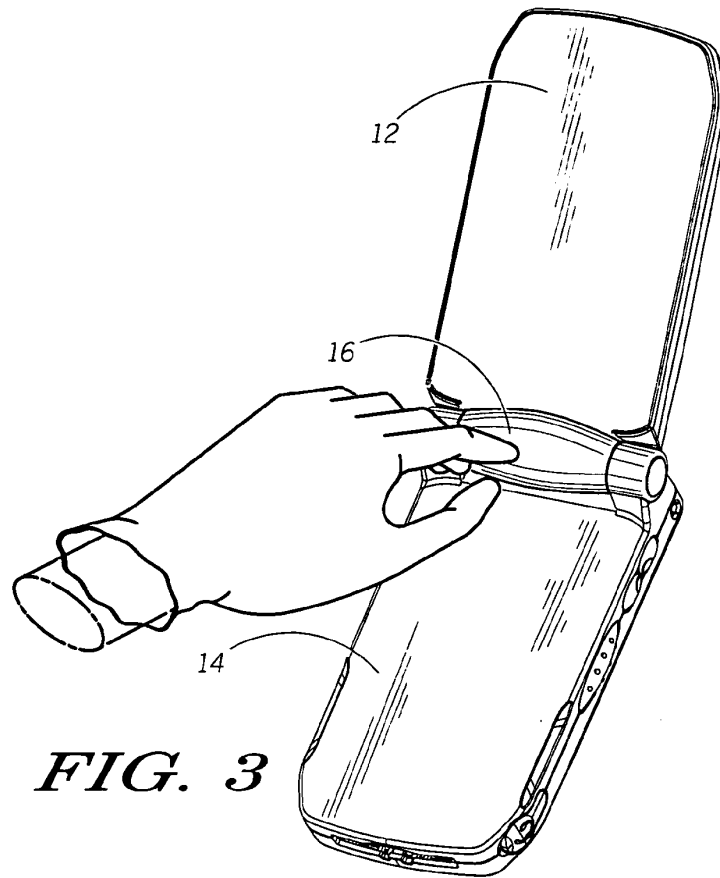


FIG. 2



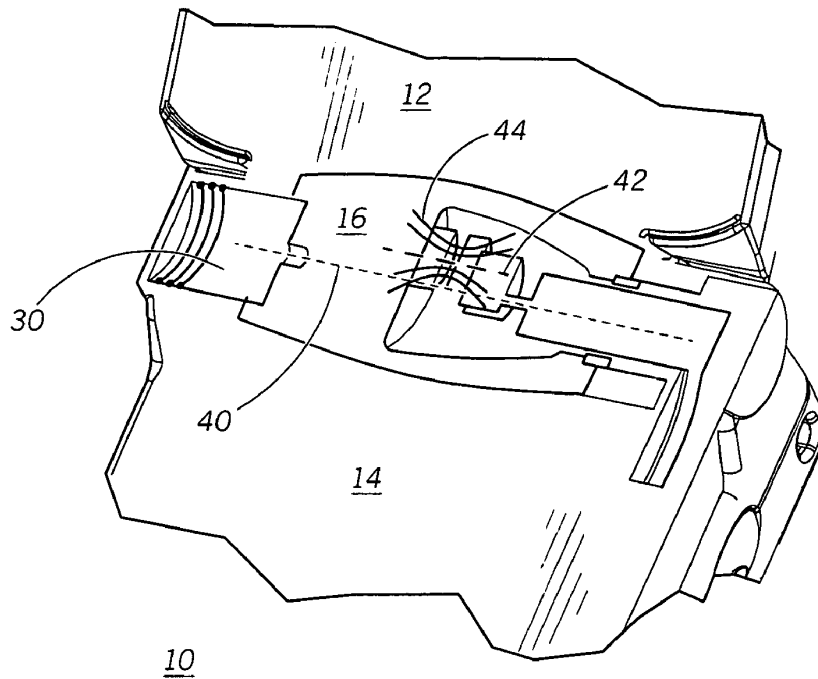


FIG. 5

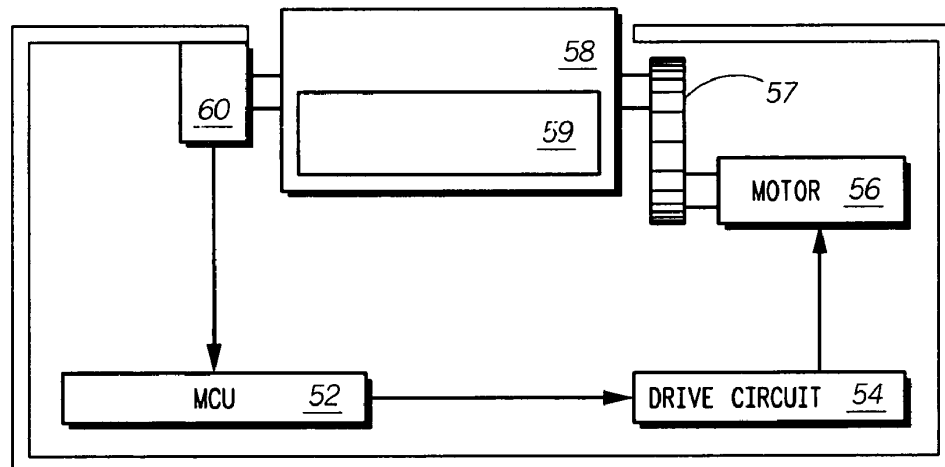
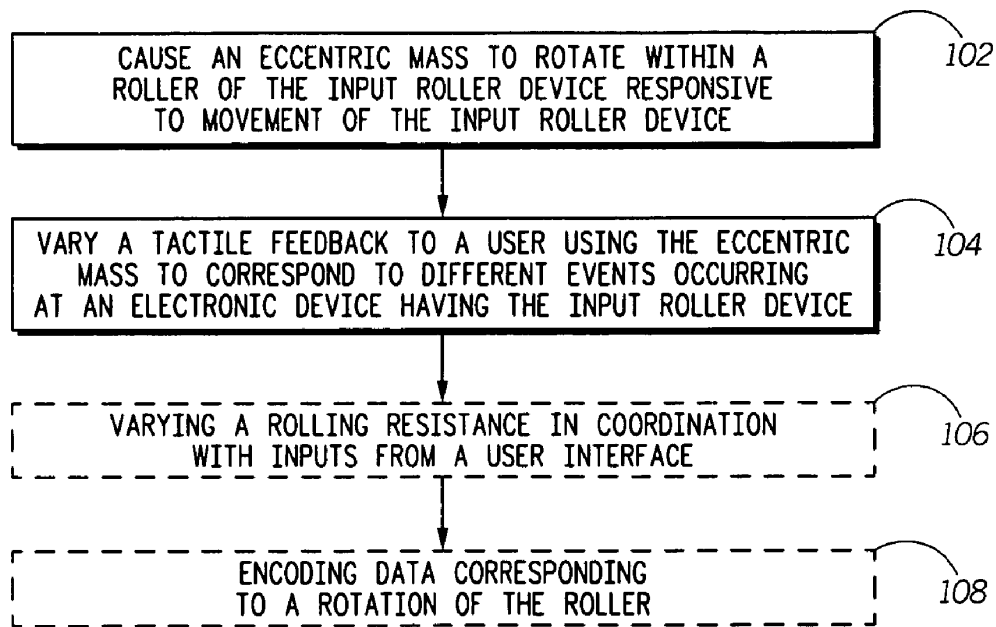


FIG. 6

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FIG. 7

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