

27. A haptic feedback interface device as recited in claim 26 wherein said EAP element is operative to detect contact of said user with said manipulandum.

28. A haptic feedback interface device as recited in claim 26 wherein said EAP element is operative to detect an amount of pressure on said EAP element caused by said user.

29. A haptic feedback interface device as recited in claim 26 wherein said force output by said electroactive polymer is a linear force.

30. A haptic feedback interface device as recited in claim 26 wherein said interface device includes a joystick or trackpoint controller.

31. An method for outputting haptic sensations to a user of an interface device, the interface device manipulated by a user and coupled to a host microprocessor implementing a host application program, the method comprising:

detecting said manipulation of said interface device by said user and outputting sensor signals representative of said manipulation; and

outputting a force to said user using an electroactive polymer actuator by sending signals to said electroactive polymer actuator, where said force is caused by motion of said actuator, said force providing a haptic sensation to said user.

32. A method as recited in claim 31 wherein said electroactive polymer actuator outputs a rotary force.

33. A method as recited in claim 31 wherein said electroactive polymer actuator outputs a linear force.

34. A method as recited in claim 31 wherein said electroactive polymer actuator moves a braking member against a moving part of said interface device to cause a resistance force to said moving part.

35. A method as recited in claim 31 wherein said electroactive polymer moves portions of a device housing of said haptic feedback interface device to provide said force to said user.

* * * * *