

## CLAIMS

1. A haptic device comprising:
  - a drum configured to rotate about an axis;
  - a cord wound around the drum;
  - a user-actuatable lever operatively coupled to the drum and configured to receive a user-actuation force;
  - a position sensor configured to determine a rotational position of the drum; and
  - an actuator operatively coupled to the cord and configured to apply a tension to the cord that further applies friction to brake the drum to cause the user-actuatable lever to provide a user-perceived resistance that opposes the user-actuation force, and where the user-perceived resistance varies as a function of the rotational position of the drum.
2. The haptic device of claim 1, where the user-perceived resistance is configured to change according to a resistance profile for a rotation range of the drum selected from a plurality of predetermined resistance profiles.
3. The haptic device of claim 2, where the resistance profile specifies that the user-perceived resistance changes linearly over a least a portion of the rotation range of the drum.
4. The haptic device of claim 2, where the resistance profile includes a hard stop at a designated position within a rotation range of the drum.
5. The haptic device of claim 1, further comprising:
  - a communication subsystem communicatively coupled to a computing device and configured to:
    - send the rotational position of the drum to the computing device, and
    - receive a -feedback signal from the computing device, where the actuator is controlled based on the signal to apply the tension to the cord to provide the user-perceived resistance, and where the user-perceived resistance is determined further based at least on a parameter of the computing device.
6. The haptic device of claim 1, where the user-actuation force is a first user-actuation force applied in a first actuation direction, where the cord is a first cord wound around the drum in a first direction, where the haptic device further comprises:
  - a second cord wound around the drum in a second direction that opposes the first direction, where a tension is applied to the second cord that further applies friction to the drum to cause the user-actuatable lever to provide a user-perceived resistance that opposes a second user-actuation force in a second actuation direction that opposes the first actuation

direction.

7. The haptic device of claim 1, where the cord is a first cord, where the actuator is a first actuator, and where the haptic device further comprises:

- a second cord wound around the drum;
- a spring coupled to the second cord and configured to bias the user-actuatable lever;
- a second actuator operatively coupled to the second cord and configured to apply a tension to the second cord that further applies friction to brake the drum to cause the user-actuatable lever to provide a user-perceived resistance that includes a spring force of the spring and opposes the user-actuation force.

8. The haptic device of claim 1, where the user-actuatable lever includes a trigger joint, and where the haptic device further comprises:

- a finger ring operatively coupled to the trigger joint and configured to wrap around a user's finger and rotate about the trigger joint based on the user-actuation force.

9. The haptic device of claim 8, further comprising:

- a trigger bias spring operatively coupled between the finger ring and the user-actuatable lever.

10. The haptic device of claim 8, where the user-actuatable lever includes a trigger switch configured to determine a position of the user's finger on the finger ring, and where the user-perceived resistance is determined based on at least the position of the user's finger on the finger ring.