the armature **5** opposed thereto in response to the received current. The armature **5** receives from the actuator **3** suction force corresponding to the current applied to the actuator **3**. At this point, the armature return spring **6** extends in the thickness direction, and the armature **5** is thereby adsorbed to the top surface of the actuator **3**. When the knob **10** is turned in this state, since the armature **5** is adsorbed to the actuator **3**, friction force corresponding to suction force is generated, thereby increasing rotation torque for turning the knob **10**. Thus, predetermined rotation torque is provided to the knob **10** by friction force (generated force) based on the predetermined composite force pattern.

[**0044**] When a current applied to the actuator **3** is stopped, the actuator **3** loses suction force for sucking the armature **5**, whereby the armature return spring **6** contracts, the armature **5** parts from the top surface of the actuator **3**, and the knob **10** turns without the friction force of the armature **5**.

[**0045**] Composite force patterns and the method of forming a composite force pattern from unit force patterns will be described hereinbelow.

[**0046**] **FIGS. 3A** to **3**F show composite force patterns. As for the composite force pattern of **FIG. 3**A, when the rotation angle of the knob **10** is increased from zero, force (generated force) for increasing the rotation torque of the knob **10** gradually increases from zero, and stops increasing and begins to decrease at a rotation angle of 80°. When the knob **10** is further turned, generated force keeps decreasing, and stops decreasing and begins to increase at an angle of 120°. When the knob **10** is still further turned, generated force stops increasing and becomes a fixed value at 160°. In this case, a click feel sensation can be obtained at the rotation angle position where generated force changes from increasing to decreasing, the rotation angle position where generated force changes from decreasing to increasing, and at the rotation angle position where generated force stop increasing and becomes fixed. Therefore, a click feel sensation can be obtained at rotation angles of 80°, 120° and 160° during one 360° rotation.

[**0047**] As for the composite force pattern of **FIG. 3**B, generated force applied to the knob **10** is fixed and rotation torque has fixed weight during one 360° rotation.

[**0048**] As for the composite force pattern of **FIG. 3**C, when the rotation angle of the knob **10** is increased from zero, generated force applied to the knob **10** increases gradually, and stops increasing and begins to decrease at a rotation angle of 80°. When the knob **10** is further turned, generated force keeps decreasing and stops decreasing at 120°. As for the composite force pattern in this case, the increase and decrease of generated force at a range of 0 to 120° repeat three times during one 360° rotation. Also in this case, a click feel sensation is obtained at the rotation angle positions where generated force changes from increasing to decreasing and the rotation angle positions where generated force changes from decreasing to increasing. Therefore, in this case, a click feel sensation is obtained six times at rotation angles of 80°, 120°, 200°, 240°, 320° and 360° during one 360° rotation.

[**0049**] As for the composite force pattern of **FIG. 3**D, when the rotation angle of the knob **10** is increased from zero, generated force applied to the knob **10** gradually increases from a predetermined value and stops increasing at a rotation angle of 40°. In this composite force pattern, the change of generated force at a range of 0 to 40° repeats nine times. Therefore, a click feel sensation is obtained nine times at intervals of 40° during one 360° rotation.

[**0050**] As for the composite force pattern of **FIG. 3**E, when the rotation angle of the knob is increased from zero, generated force applied to knob **10** gradually decreases from a predetermined value and stops decreasing at a rotation angle of 40°. In this composite force pattern, the change of generated force at a range of 0 to 40° repeats nine times during one 360° rotation. Therefore, a click feel sensation is obtained nine times at intervals of 40° during one 360° rotation.

[**0051**] As for the composite force pattern of **FIG. 3**F, when the rotation angle of the knob **10** is increased from zero, generated force applied to the knob **10** gradually increases from a predetermined value and begins to decrease at a rotation angle of 40°. When the knob **10** is further turned, generated force keeps decreasing and stop decreasing at 80°. In this composite force pattern, the change of generated force at a range of 0 to 80° repeats four times during one 360° rotation and then the change of generated force at a rotation angle of 0 to 40° is added. In this case, generated force changes nine times during one 360° rotation. Therefore, a click feel sensation is obtained nine times at intervals of 40° during one 360° rotation.

[**0052**] Although the timings of obtaining a click feel sensation from the composite force patterns of **FIG. 3D, 3E** and **3**F are the same, the feel sensations differs from one another because their force patterns have different waveforms. Therefore, the click feel sensations obtained in **FIG. 3A** differs from the click feel sensations obtained in **FIG. 3**D, **FIG. 3**E and **FIG. 3F** because their composite force patterns have different waveforms. The click feel sensations at 80° in **FIG. 3**A and **FIG. 3C** are the same because their force patterns have the same waveform.

[**0053**] The unit force patterns for forming the above composite force patterns are shown in **FIG. 4A** to **FIG. 4D**. As for the unit force pattern of unit **1** shown in **FIG. 4**A, generated force gradually increases from zero at a range of 0 to 80° and gradually decreases from a value at 80° to a predetermined value at 120° at a range of 80 to 120°. In the case of the force pattern of unit **1**, since generated force changes from increasing to decreasing at 80°, the operation feel sensation of the knob **10** becomes a click feel sensation at 80°.

[**0054**] The unit force pattern of unit **2** shown in **FIG. 4B** has an ascent in which generated force increases from a predetermined value at a range of 0 to 40°. In the case of the unit force pattern of unit **2**, since generated force grows as the rotation angle increases, the operation feel sensation of the knob **10** is a deceleration feel sensation.

[**0055**] The unit force pattern of unit **3** shown in **FIG. 4C** has a descent in which generated force decreases from a predetermined value at a range of 0 to 40°. In the case of the unit force pattern of unit **3**, since generated force decreases as the rotation angle increases, the operation feel sensation of the knob **10** is an acceleration feel sensation.

[**0056**] The unit force pattern of unit **4** shown in **FIG. 4D** is like a horizontal straight line that generated force does not change from a predetermined value at a range of 0 to 40°. In