and the second gear **4***c*. In this manner, the radio is tuned to a desired radio station that is displayed on the screen of the monitor **16**.

[**0106**] When the desired radio station (e.g., TBS) has been selected by rotating the manipulation knob **2**, the rotation of the knob **2** is stopped (indicated by numeral **35** in **FIG. 7**) and the manipulation knob **2** is pushed in the axial direction, whereby the push-button switch **11** (see **FIG. 1**) is turned on to complete the selection of the desired radio station (indicated by numeral **36** in **FIG. 7**).

[**0107**] Next, the radio sound volume control operation will be described with reference to **FIG. 4**. As the manipulation knob **2** is rotated clockwise or counterclockwise, the motor **4** is driven by the controller **14** so as to generate, on the manipulation knob **2**, haptic senses that are consecutive one-click feels. The radio sound volume is increased or decreased every haptic sense.

[**0108**] Next, the CD song selection operation will be described with reference to **FIG. 5**. As the manipulation knob **2** is rotated clockwise or counterclockwise, the motor **4** is driven by the controller **14** so as to generate, on the manipulation knob **2**, haptic senses that are two-click feels at prescribed intervals. For example, a first song, a second song, . . . , and an eighth song of a CD are selected in association with the respective haptic senses.

[**0109**] Next, the air-conditioner temperature setting operation will be described with reference to **FIG. 6**. As the manipulation knob **2** is rotated clockwise or counterclockwise, the motor **4** is driven by the controller **14** so as to generate, on the manipulation knob **2**, a haptic sense that is a torque feel. The torque feel becomes stronger as the manipulation knob **2** is rotated clockwise or counterclockwise from the center position (see **FIG. 6**). The temperature of the air-conditioner is set by using the torque feel on the manipulation knob **2**.

[**0110**] The radio sound volume control operation, the CD song selection operation, and the air-conditioner temperature setting operation will not be described any further because they are almost the same as the radio tuning operation that was described above with reference to **FIG. 7**.

[**0111**] In the haptic-sense-generation input device according to the embodiment, the first gear **2***f* is engaged with the three gears, that is, the second, third, and fourth gears **4***c*, **5**, and **7**, that are located at the respective apices of an equilateral triangle. However, the invention is not limited to such a case. The three gears may be located at the respective apices of a triangle that is not an equilateral triangle. As a further alternative, the first gear **2***f* may be engaged with two gears.

[**0112**] In the haptic-sense-generation input device according to the embodiment, the first gear **2***f* of the manipulation knob **2** that is an internal gear is engaged with the second gear **4***c* that is a spur gear and is attached to the motor shaft **4***b*. However, the invention is not limited to such a case. The first gear **2***f* that is engaged with the second gear **4***c* may be a spur gear.

[**0113**] As described above, the haptic-sense-generation input device according to the invention comprises the manipulation knob shaft and the motor shaft that are parallel with each other, the first gear that is attached to the manipulation knob shaft so as to be rotated by the manipulation knob, and the second gear that is attached to the motor shaft and is rotated by the first gear, wherein a haptic sense that is generated by the motor is transmitted to the manipulation knob via the first gear and the second gear. With this configuration, the motor can be reduced in size and weight as well as in cost while strong haptic senses can be obtained. Further, the haptic-sense-generation input device as a whole can be reduced in size and weight.

[**0114**] In the haptic-sense-generation input device according to the invention, the first gear is an internal gear and the second gear and the third gear are engaged with the internal gear. Since the second and third gears having prescribed gear ratios with respect to the first gear are rotated by the first gear, the gear rotation is made stable while the haptic-sense-generation input device is reduced in size.

[**0115**] In the haptic-sense-generation input device according to the invention, the second gear, the third gear, and the fourth gear are located at the respective apices of an equilateral triangle. This makes the rotation of the internal gear more stable.

What is claimed is:

1. A haptic-sense-generation input device comprising:

a manipulation knob;

a shaft that holds the manipulation knob and is held rotatably by a bearing;

a motor having a motor shaft that is parallel with the shaft;

rotation detecting means for detecting a rotation angle of the manipulation knob;

a first gear that is attached to the shaft so as to be rotated by the manipulation knob; and

a second gear that is attached to the motor shaft and is rotated by the first gear, wherein a haptic sense that is generated by the motor is transmitted to the manipulation knob via the first gear and the second gear.

2. The haptic-sense-generation input device according to claim 1, wherein the rotation detecting means comprises a rotator and a rotatable support shaft that holds the rotator and is parallel with the shaft and the motor shaft, and wherein the haptic-sense-generation input device further comprises a third gear that is rotated by the first gear to manipulate the rotation detecting means.

3. The haptic-sense-generation input device according to claim 2, wherein the first gear is an internal gear, and the second gear and the third gear are engaged with the internal gear.

4. The haptic-sense-generation input device according to claim 3, wherein the manipulation knob is formed with the first gear that is the internal gear.

5. The haptic-sense-generation input device according to claim 3, further comprising a fourth gear that is engaged with the internal gear.

6. The haptic-sense-generation input device according to claim 5, wherein the second gear, the third gear, and the fourth gear are located at respective apices of an equilateral triangle.

7. The haptic-sense-generation input device according to claim 1, wherein the shaft is movable in an axial direction thereof, and wherein the haptic-sense-generation input