CLAIMS

1. An operation apparatus for a sunlight shielding apparatus, the sunlight shielding apparatus comprising:

a winding shaft rotatably supported by a pair of support brackets fixed to a mounting surface;

a sunlight shielding material configured to be raised or lowered based on rotation of the winding shaft;

a pulley provided in a region adjacent to one end of the winding shaft;

an operation cord engaged with the pulley; and

a drive mechanism configured to rotationally drive the winding shaft on the basis of an operation of the operation cord, wherein

the drive mechanism comprises:

a case rotatably supporting the pulley, being rotatable with respect to the support bracket, and hanging from the support bracket by self-weight; and

a transmission mechanism disposed on the case and configured to transmit rotation of the pulley to the winding shaft.

2. The operation apparatus of claim 1, wherein

the case comprises a synthetic resin and is rotatably supported by a spindle fixed to the support bracket, and

a rotation plate comprising a metal plate is attached to the case.

3. The operation apparatus of claim 2, wherein

the case comprises a through hole through which the spindle can be passed and a shaft adjacent to the through hole, and

the rotation plate is fitted to the shaft.

4. The operation apparatus of claim 2 or 3, wherein

the pulley and the transmission mechanism are supported between the case and the rotation plate.

5. The operation apparatus of any one of claims 2 to 4, wherein

the sunlight shielding apparatus further comprises a holder holding the case and the rotation plate on the support bracket at any angle.

6. The operation apparatus of claim 1, wherein

a base end of the case is rotatably supported by the spindle fixed to the support bracket,

the transmission mechanism comprises a plurality of spur gears,

the first spur gear in the train of the spur gears is formed integrally with the pulley, and

the pulley is disposed in such a manner to protrude from the first spur gear toward a center of the winding shaft in the axial direction thereof and supported by a front end of the case.

7. The operation apparatus of claim 6, wherein

the case is provided with a cover covering the pulley, and

the cover protrudes from the case toward the center of the winding shaft in the axial direction thereof.

8. The operation apparatus of any one of claims 4 to 7, wherein

the transmission mechanism comprises:

a drive gear formed integrally with the pulley;

an intermediate gear meshed with the drive gear; and

a transmission gear configured to transmit rotation of the intermediate gear to the winding shaft.

9. The operation apparatus of any one of claims 1 to 8, wherein

the case is provided with a guide configured to guide the operation cord, and the guide opens downward.

10. The operation apparatus of any one of claims 1 to 9, wherein

the drive mechanism and the case are formed in such a manner to be axisymmetric in front-back directions.

11. An operation apparatus for a sunlight shielding apparatus, the sunlight shielding apparatus comprising:

a winding shaft rotatably supported by a pair of support brackets fixed to a mounting surface;

a sunlight shielding material configured to be raised or lowered based on rotation of the winding shaft;

a pulley in a region adjacent to one end of the winding shaft;

an operation cord engaged with the pulley; and

a drive mechanism configured to rotationally drive the winding shaft on the basis of an operation of the operation cord, wherein

the drive mechanism comprises:

a case rotatably supporting the pulley, hanging from the support bracket, and being rotatable with respect to the support bracket in front-back directions in such a manner to be inclined at an angle corresponding to a pulling angle in front-back directions of the operation cord; and

a transmission mechanism disposed on the case and configured to transmit rotation of the pulley to the winding shaft.

CLAIMS

1. An operation apparatus for a sunlight shielding apparatus, the sunlight shielding apparatus comprising:

a winding shaft rotatably supported by a pair of support brackets fixed to a mounting surface;

a sunlight shielding material configured to be raised or lowered based on rotation of the winding shaft;

a pulley provided in a region adjacent to one end of the winding shaft;

an operation cord engaged with the pulley; and

a drive mechanism configured to rotationally drive the winding shaft on the basis of an operation of the operation cord, wherein

the drive mechanism comprises:

a case rotatably supporting the pulley, being rotatable around an axis of the winding shaft in front-back directions with respect to the support bracket, and hanging from a spindle fixed to the support bracket by self-weight; and

a transmission mechanism disposed on the case and configured to transmit rotation of the pulley to the winding shaft.

2. The operation apparatus of claim 1, wherein

the case comprises a synthetic resin, and

a rotation plate comprising a metal plate is attached to the case.

3. The operation apparatus of claim 2, wherein

the case has a through hole through which the spindle can be passed and a

shaft adjacent to the through hole, and

the rotation plate is fitted to the shaft.

4. The operation apparatus of claim 2 or 3, wherein

the pulley and the transmission mechanism are supported between the case and the rotation plate.

5. The operation apparatus of any one of claims 2 to 4, wherein

the sunlight shielding apparatus further comprises a holder holding the case and the rotation plate on the support bracket at any angle.

6. The operation apparatus of claim 1, wherein

a base end of the case is rotatably supported by the spindle,

the transmission mechanism comprises a plurality of spur gears,

the first spur gear in the train of the spur gears is formed integrally with the pulley, and

the pulley is disposed in such a manner to protrude from the first spur gear toward a center of the winding shaft in the axial direction thereof and supported by a front end of the case.

7. The operation apparatus of claim 6, wherein

the case is provided with a cover covering the pulley, and

the cover protrudes from the case toward the center of the winding shaft in the axial direction thereof.

8. The operation apparatus of any one of claims 4 to 7, wherein

the transmission mechanism comprises:

a drive gear formed integrally with the pulley;

an intermediate gear meshed with the drive gear; and

a transmission gear configured to transmit rotation of the intermediate gear to the winding shaft.

9. The operation apparatus of any one of claims 1 to 8, wherein

the case is provided with a guide configured to guide the operation cord, and

the guide opens downward.

10. The operation apparatus of any one of claims 1 to 9, wherein

the drive mechanism and the case are formed in such a manner to be axisymmetric in front-back directions.

11. An operation apparatus for a sunlight shielding apparatus, the sunlight shielding apparatus comprising:

a winding shaft rotatably supported by a pair of support brackets fixed to a mounting surface;

a sunlight shielding material configured to be raised or lowered based on rotation of the winding shaft;

a pulley in a region adjacent to one end of the winding shaft;

an operation cord engaged with the pulley; and

a drive mechanism configured to rotationally drive the winding shaft on the basis of an operation of the operation cord, wherein

the drive mechanism comprises:

a case rotatably supporting the pulley, hanging from a spindle fixed

to the support bracket, and being rotatable around an axis of the winding shaft in front-back directions with respect to the support bracket in such a manner to be inclined at an angle corresponding to a pulling angle in front-back directions of the operation cord; and

a transmission mechanism disposed on the case and configured to transmit rotation of the pulley to the winding shaft.

12. The operation apparatus of any one of claims 1 to 11, wherein

the pulley is rotatably supported to the case in such a position not to be coaxial with the winding shaft.

13. The operation apparatus of any one of claims 1 to 12, wherein

the case is positioned on the same side with the winding shaft with respect to the support bracket.