coaxial manner, such that the central gear 142 is rotationally coupled with the transmission axle 112.

[0030] Referring to FIGS. 5 and 7, the torsion spring 144 is assembled in the spring cavity 140A and around the transmission axle 112. The torsion spring 144 can exemplary be a constant force spring having a first or inner end 144A (i.e., disposed radially near the transmission axle 112) and a second or outer end 144B (i.e., disposed radially away from the transmission axle 112). The torsion spring 144 winds around an axle sleeve 152, the first end 144A of the torsion spring 144 being affixed with the axle sleeve 152, and the second end 144B of the torsion spring 144 being affixed with an inner sidewall of the spring cavity 140A of the casing portion 140. Once the torsion spring 144 is assembled in the spring cavity 140A, the spring cavity 140A can be closed by a side cap 149.

[0031] The coupling member 146 is assembled around the transmission axle 112 in a coaxial manner, i.e., the coupling member 146 and the transmission axle 112 have a same axis. The coupling member 146 can include the axle sleeve 152 and a gear carrier 154 affixed with each other, the gear carrier 154 having a central hole 156. The axle sleeve 152 is disposed in the spring cavity 140A. The gear carrier 154 is disposed adjacent to the gear cavity 140B of the casing portion 140, and is affixed with the axle sleeve 152 through an opening 160 formed through a sidewall 158 of the spring cavity 140A. The gear carrier 154 and the axle sleeve 152 can be thereby rotationally coupled with each other. Since the first end 144A of the torsion spring 144 is operatively coupled with the gear carrier 154 via its connection to the axle sleeve 152, the first end 144A of the spring 144, the axle sleeve 152 and the gear carrier 154 can move in unison. Moreover, the gear cavity 140B

WHAT IS CLAIMED IS:

1. A control system for a window shade, comprising:

a suspension member;

a first and a second casing portion;

a rotary drum pivotally connected with the first casing portion and affixed with the suspension member, the rotary drum being rotatable to wind and unwind the suspension member;

a torsion spring operable to bias the rotary drum in rotation for winding the suspension member, the torsion spring having a first and a second end, the second end being affixed with the second casing portion;

a coupling member affixed with the second end of the torsion spring, the coupling member including a gear carrier and an axle sleeve affixed with each other, the torsion spring winding around the axle sleeve with the first end of the torsion spring affixed with the axle sleeve;

a transmission axle disposed through the torsion spring, the transmission axle being rotationally coupled with the rotary drum;

a central gear rotationally coupled with the transmission axle;

a ring affixed with the second casing portion and having a plurality of teeth; and

a plurality of planetary gears respectively connected pivotally with the gear carrier of the coupling member, the planetary gears being respectively meshed with the central gear and the teeth of the ring, wherein the gear carrier, the axle sleeve and the first end of the torsion spring are movable in unison at a speed different from a rotation speed of the transmission axle.

2. The control system according to claim 1, wherein the coupling member is rotatable at a speed slower than that of the rotary drum.

3. The control system according to claim 1, wherein the transmission axle is fixedly connected with the central gear in a coaxial manner.

4. The control system according to claim 1, wherein the second casing portion has a sidewall, and the central gear is pivotally connected with the second casing portion through the sidewall.

5. The control system according to claim 1, wherein the transmission axle respectively extends through the central gear and the coupling member.

6. The control system according to claim 1, wherein the transmission axle respectively extends through the central gear, the gear carrier and the axle sleeve.

7. The control system according to claim 6, wherein while the transmission axle and the central gear rotate synchronously, the gear carrier and the axle sleeve rotate at a relatively slower speed.

8. The control system according to claim 1, wherein the first and second casing portions are adjacent to each other.

9. The control system according to claim 8, wherein the second casing portion includes a spring cavity and a gear cavity, the torsion spring being received in the spring cavity, the central gear and the planetary gears being received in the gear cavity, and the gear cavity being located between the spring cavity and the first casing portion.

10. The control system according to claim 1, wherein the rotary drum has a first and a second side opposite to each other, the second side being located near the central gear,

the suspension member being affixed with the rotary drum near the first side and winding around an outer surface of the rotary drum from the second side toward the first side.

11. A window shade comprising:

a head rail, a bottom part, and a shading structure disposed between the head rail and the bottom part; and

the control system according to claim 1, being disposed in the head rail, the suspension member of the control system having a first and a second end respectively affixed with the rotary drum and bottom part.

12. The window shade according to claim 11, wherein the torsion spring biases the rotary drum in rotation for winding the suspension member when the bottom part rises toward the head rail.

13. The window shade according to claim 11, wherein the torsion spring applies a spring force for assisting in keeping the bottom part stationary at any position below the head rail.

14. A control system for a window shade, comprising:

a suspension member;

a first and a second casing portion;

a rotary drum pivotally connected with the first casing portion and affixed with the suspension member, the rotary drum being rotatable to wind and unwind the suspension member;

a torsion spring assembled coaxial to the transmission axle and operable to bias the rotary drum in rotation for winding the suspension member, the

torsion spring having a first and a second end, the second end being affixed with the second casing portion;

a transmission axle passing through the torsion spring, the transmission axle being rotationally coupled with the rotary drum; and

a speed reducer respectively connected with the transmission axle and the first end of the torsion spring, the speed reducer including a plurality of gears configured to convert rotational movement of the transmission axle and the rotary drum to a slower displacement of the first end of the torsion spring, wherein the speed reducer includes:

a central gear fixedly connected with the transmission axle in a coaxial manner;

a ring affixed with the second casing portion and having a plurality of teeth;

a gear carrier and an axle sleeve affixed with each other, the first end of the torsion spring being affixed with the axle sleeve; and

a plurality of planetary gears respectively connected pivotally with the gear carrier, the planetary gears being respectively meshed with the central gear and the teeth of the ring;

wherein the gear carrier and the axle sleeve are rotatable at a speed slower than that of the transmission axle and the rotary drum.

15. The control system according to claim 14, wherein the second casing portion has a sidewall, and the central gear is pivotally connected with the second casing portion through the sidewall.

16. The control system according to claim 14, wherein the transmission axle respectively extends through the central gear, the gear carrier and the axle sleeve.

17. A window shade comprising:

a head rail, a bottom part, and a shading structure disposed between the head rail and the bottom part; and

the control system according to claim 14, being disposed in the head rail, the suspension member of the control system having a first and a second end respectively affixed with the rotary drum and bottom part, wherein the torsion spring applies a spring force that biases the rotary drum in rotation for winding the suspension member when the bottom part rises toward the head rail.