

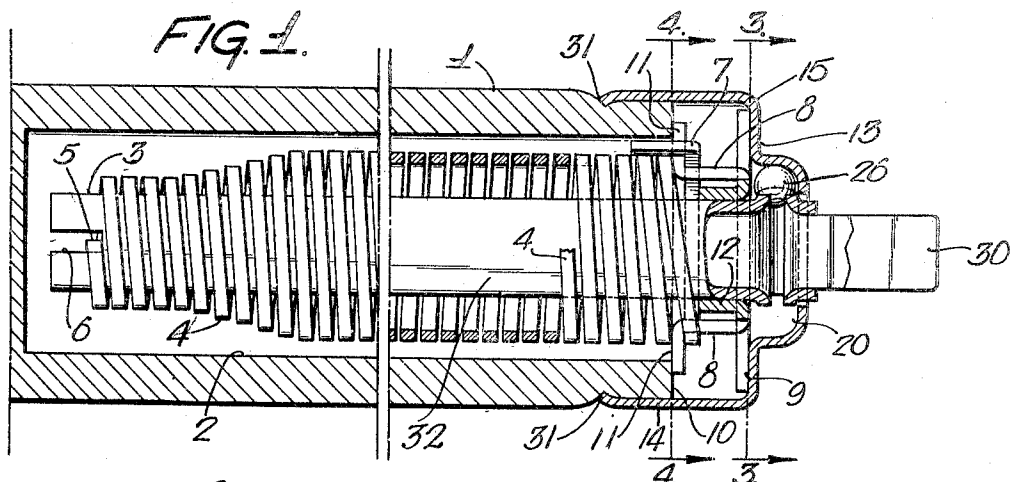
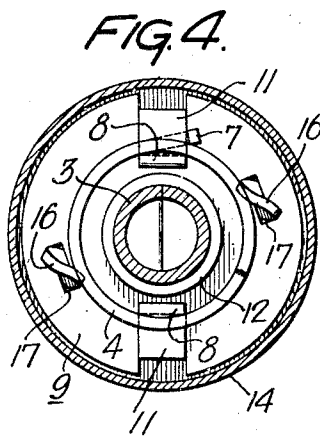
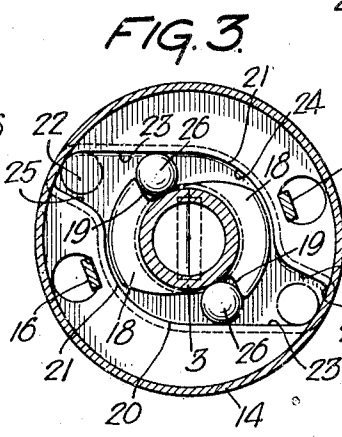
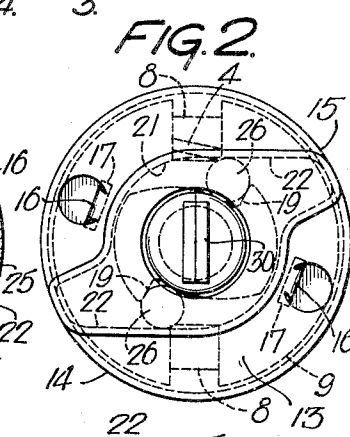
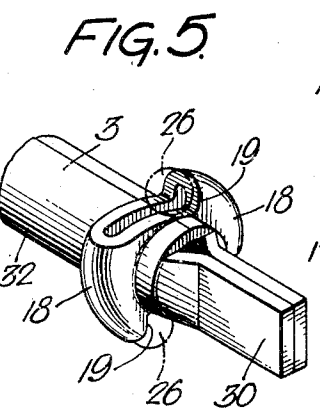
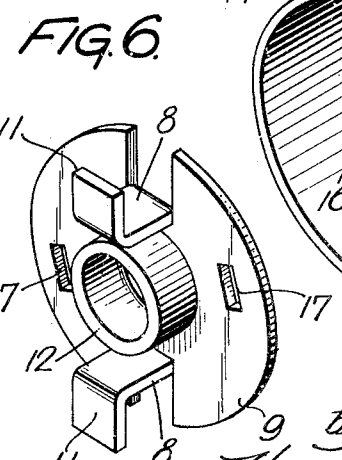
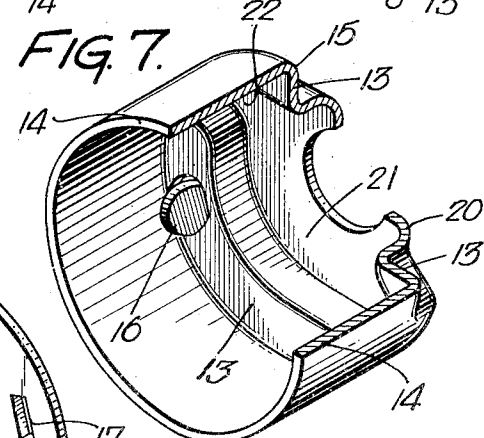
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SHADE ROLLER MECHANISM

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SHADE ROLLER MECHANISM

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2 Claims. (Cl. 160—297)

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This invention relates to roller structures for window shades; and more particularly to the operating mechanism of the shade roller, including the clutching means by which the shade roller is held against rotation for maintaining the lower edge of the shade or curtain wound thereon at the desired elevation with respect to the sill of the window adjacent which a roller shade embodying the present invention is hung.

The present invention resides in the simplification of the clutching mechanism and the reduction to a minimum of the number of operating elements required in a shade roller constructed in accordance with the principles of the present invention, as compared with shade rollers of the prior art.

Another object of the present invention is to eliminate the troublesome wooden spindle to which one end of the roller-operating spring is usually secured.

Another object of the invention is to construct the operating mechanism of a shade roller for assembly as a unit apart from the shade roller and in such a manner that these units may be readily applied to the shade rollers subsequently.

Other features of the invention reside in the simplification of the construction of the specific elements of the operating mechanism, whereby the separate elements may be readily manufactured from sheet metal on suitable presses at a reduced cost.

In the accompanying drawing:

Fig. 1 is an enlarged longitudinal sectional view of one end of a shade roller including operating mechanism constructed in accordance with the present invention;

Fig. 2 is an end view of the structure shown in Fig. 1;

Fig. 3 is a transverse section taken on the line 3—3, Fig. 1;

Fig. 4 is a transverse section taken on the line 4—4, Fig. 1;

Fig. 5 is a fragmentary perspective view of one end of the roller spindle;

Fig. 6 is a perspective view of a disc which carries a bearing for the roller spindle and affords anchorages for one end of the roller-operating spring; and

Fig. 7 is a perspective view, partly in section, of a cap for one end of the shade roller.

In Fig. 1 of the accompanying drawing, a portion of a shade roller, adjacent one end thereof, is shown at 1. This end of the roller 1 is provided with an axial bore 2, for receiving the spindle 3 and the roller-operating spring 4, which

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latter encircles the spindle 3 and has one of its ends 5 disposed in a transverse slot 6 formed in the inner end of the spindle 3, to secure the one end of the spring 4 to the spindle 3 against relative rotation therebetween.

The opposite end 7 of the spring 4 is hooked around one of a pair of L-shaped legs 8, 8 which are formed integral with a transverse plate or disc 9. The disc 9 lies parallel to and in spaced relation from a transverse end surface 10 of the roller 1. The legs 8, 8 are provided with feet 11, 11, which bear against the end surface 10 of the roller 1 and definitely space the disc 9 therefrom a predetermined distance.

The transverse plate or disc 9 carries at its center a bearing 12 for the spindle 3. The marginal portion of the disc 9 lies in contact with a corresponding portion of the inner surface of an end wall 13 of a cap 15, which latter encloses the end 10 of the roller. The end wall 13 is provided with a central opening through which the outer end of the spindle 3 projects. Integral with and surrounding the end wall 13, the cap 15 is provided with a cylindrical skirt or sleeve 14 which is adapted to encircle the roller 1 adjacent the end surface 10 thereof.

The disc 9 is secured to the end wall 13 of the cap 15 by means of ears 16, 16 which are formed integral with the wall 13 of the cap 15 and pass through slots 17, 17 formed in the centering disc or plate 9 which carries the bearing 12 for the spindle 3. After assembly of these two parts 9 and 15, the ears 16, 16, are twisted, as shown in Fig. 4, to secure the disc 9 permanently to the cap 15.

The spindle 3 is provided with a pair of diametrically opposite cam lobes 18, 18 of identical shape, each including a substantially radial but slightly undercut shoulder or face 19. These cam lobes 18, 18 are formed integral with the spindle 3 and normally lie adjacent the outer side of the disc 9, within an enclosing cavity 20 formed in and by displacement of a portion of the end wall 13 of the roller cap 15.

As shown more clearly in Fig. 3, the cavity 20 includes a central generally circular portion 21 and a pair of side extensions 22, 22 each having one wall 23 tangent to the inner peripheral wall 24 of the main central cavity 21, and a second wall 25 disposed in inwardly diverging relation to the aforesaid tangent wall 23 of each extension cavity 22.

Confined within the cavity 20 between the disc 9 and the displaced portion of the end wall 13 of the cap 15, is a pair of free clutch balls 26, 26

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which are adapted, under slow rotation of the shade roller 1 in one direction, as in raising the blind or curtain wound thereon, to jamb between the undercut radial shoulders 19, 19 of the spindle cam lobes 18, 18, and the tangent faces 23, 23, respectively of the extension recesses 22, 22 of the cap 15, thereby locking the roller 1 to the spindle 3 against relative rotation therebetween, and whereby the lower edge of the shade is maintained at the elevation desired.

By slightly lowering the free end of the shade and then raising it rapidly the spring 4 will rotate the shade roller 1 rapidly, causing the clutch balls 26, 26, to move out, under centrifugal force, into the extension cavities 22, 22, until the desired elevation of the free end of the shade is attained and the speed of rotation of the roller 1 is reduced accordingly, whereupon one or the other of the balls 26, 26 will roll down the guide surface 25 of one of the extension cavities 22 to fall behind the upper of the two cam shoulders 19. When the direction of rotation of the roller 1 is reversed slowly, the ball 26 lying behind the upper cam shoulder 19 will engage the cooperating surface 23 of one of the extension cavities 22 and hold the shade roller against further rotation under the influence of the spring 4.

To hold the spindle 3 against rotation at all times, the outer end of the spindle 3 is provided with the usual flat-sided extension 30, which latter is adapted to fit a correspondingly flat-sided slot in a conventional type of shade roller bracket.

The cap 15 is secured to the roller 1 in the conventional manner, by spinning the edge 31 of the sleeve portion 14 of the cap 15 into the material of which the shade roller 1 is composed, as shown in Fig. 1.

Obviously the shade roller 1 may be composed of any suitable material including wood, paper, fibre, or metal, etc., of which conventional window shade rollers are normally composed without departing from the spirit of the invention.

As shown in the drawing, the cap 15, disc 9, and spindle 3 with its cam lobes 18, 18, its cylindrical body portion 32 and its flat end extension 30 are preferably formed of flat sheet metal stampings, as a matter of economy of manufacture, by use of modern sheet metal presses. However, it will be understood that any or all of these same parts may be otherwise formed, such for example, as by die casting, or the spindle may be machined from bar stock or otherwise formed from solid metal, plastic, vulcanized fiber or any other suitable material if desired, without departing from the spirit of the invention.

I claim:

1. A shade roller mechanism comprising a spindle having substantially radially shouldered clutch elements thereon, a roller cap including a transverse end wall apertured to receive said

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spindle and provided with an offset cavity including a substantially circular section having an interior peripheral surface substantially concentric to the axis of said spindle and at least one lateral extension having an interior wall tangent to the interior peripheral wall of said circular section, a centering plate within said roller cap including a bearing for said spindle and having axially projecting legs for predeterminedly spacing said plate from an end surface of a roller within said cap, means projecting from the transverse end wall of the cap and engaging said centering plate to secure the latter permanently to the cap, and a free ball clutch element confined within said offset cavity of the cap and operable between the shouldered clutch elements on said spindle and the interior peripheral wall of said recessed housing.

2. A shade roller mechanism comprising a spindle having substantially radially shouldered clutch elements thereon, a roller cap including a transverse end wall apertured to receive said spindle and provided with an offset cavity including a substantially circular section having an interior peripheral surface substantially concentric to the axis of said spindle and at least one lateral extension having an interior wall tangent to the interior peripheral wall of said circular section, a centering plate within said roller cap including a bearing for said spindle and having axially projecting legs for predeterminedly spacing said plate from an end surface of a roller within said cap, means projecting from the transverse end wall of the cap and engaging openings in said centering plate to secure the latter permanently to the cap, a free ball clutch element confined within said offset cavity of the cap and operable between the shouldered clutch elements on said spindle and the interior peripheral wall of said recessed housing, and an operating spring encircling said spindle having one end thereof secured to the legs of said centering plate and the opposite end secured to a distant end of said spindle.

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