Oct. 12, 1965 R. J. SMITH 3,211,212

SPRINGLESS SHADE ROLLER

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Fig. 1.

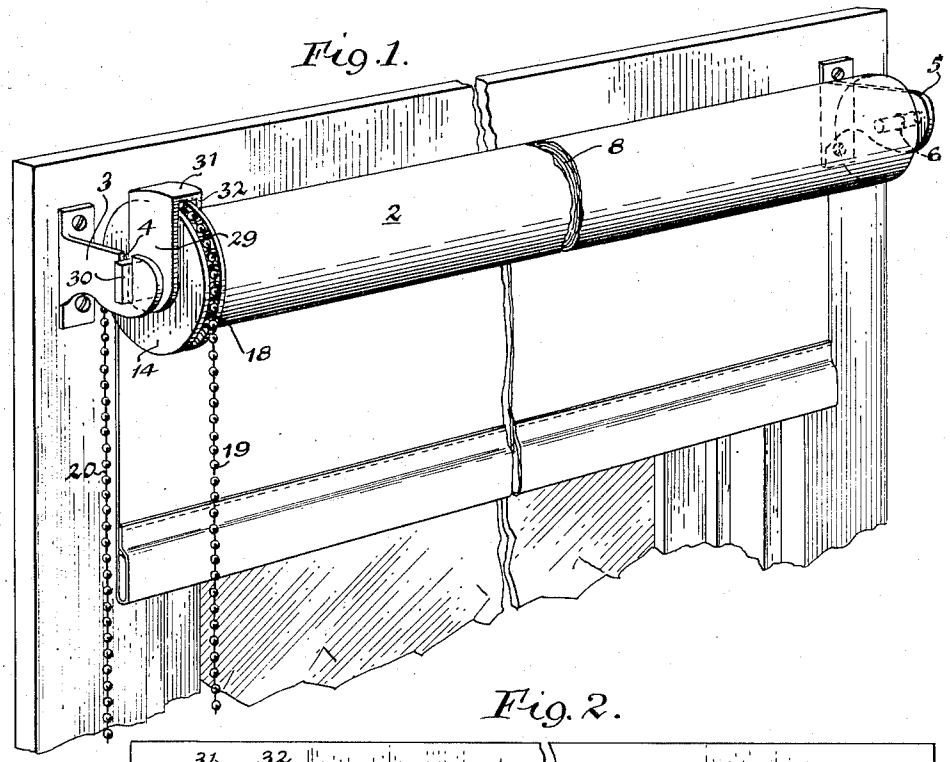


Fig. 2.

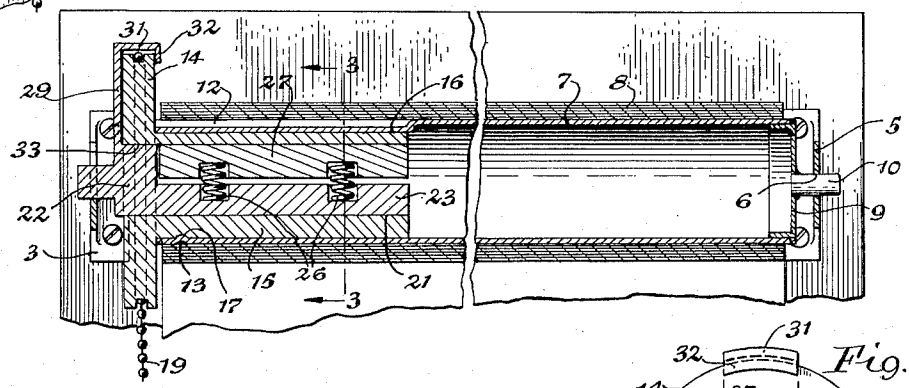


Fig. 3.

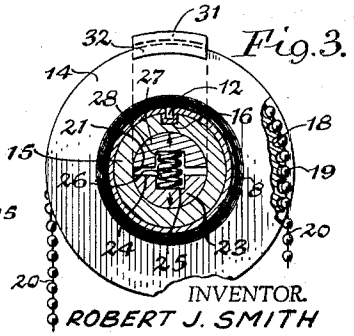


Fig. 4.

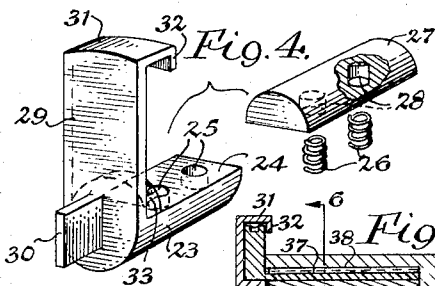


Fig. 6.

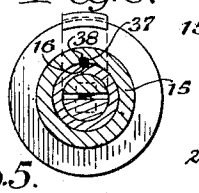
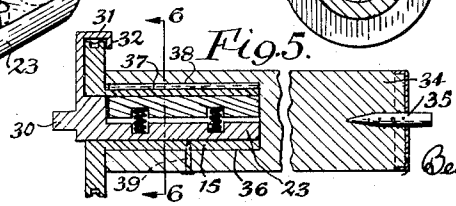


Fig. 5.



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Fig. 7.

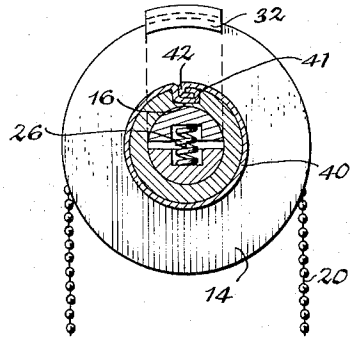


Fig. 8.

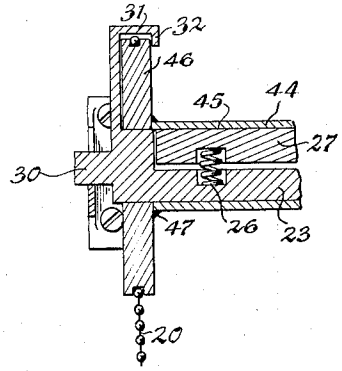
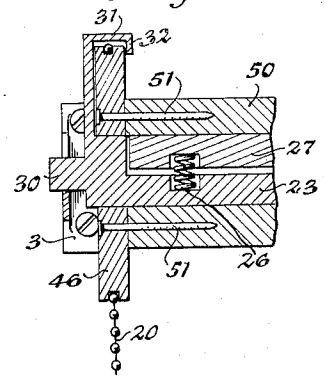


Fig. 9.



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SPRINGLESS SHADE ROLLER

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Filed Nov. 12, 1963, Ser. No. 322,681
8 Claims. (Cl. 160—298)

This invention relates to a shade roller and more particularly to the so-called springless, or side-operated, type.

Shade rollers using a spring to raise the shade have certain disadvantages in that the spring sometimes breaks, or the latch dogs jam, and the existing springless types of shade rollers also have various disadvantages or weaknesses.

An object of the present invention is to provide a sturdy operating and friction brake unit that overcomes certain defects of the prior devices.

Another object of the invention is to provide a self adjusting friction brake unit of substantial area.

A further object of the invention is to provide a unitary operating and brake unit.

A further object of the invention is to provide a unit that can be easily manufactured and assembled.

Other objects and advantages of the invention will more fully appear hereinafter.

In the drawings:

FIG. 1 is a perspective view of a shade roller incorporating my invention and shown as attached to a window frame;

FIG. 2 is a sectional view of the entire roller;

FIG. 3 is a sectional view taken on line 3—3 of FIG. 2 with a portion broken away to show the chain pull engagement;

FIG. 4 is an exploded view of the journal and brake components;

FIG. 5 is a sectional view showing the unit applied to a wooden barrel roller;

FIG. 6 is a sectional view taken on line 6—6 of FIG. 5;

FIG. 7 is a sectional view, similar to FIG. 3 but showing a lock seam type of barrel tubing;

FIG. 8 is a sectional view of a modified form of the winding assembly end of my invention; and

FIG. 9 is a sectional view of another modified form of the winding assembly end of my invention.

The shade roller 2 is shown as supported at one end by a conventional bracket 3 having an open top vertically disposed slot 4, and at the other end by a conventional bracket 5 having a round hole 6.

The roller shown in FIG. 2 and FIG. 3 has a metal cylindrical body or barrel 7 around which is partially wound a shade 8. At one end of barrel 7, a cap 9 is positioned, and cap 9 is provided with an outwardly extending round pintle or gudgeon 10 adapted to be received by and freely rotate in hole 6 of bracket 5. In the other end portion of barrel 7 the outer and interior surface is deformed to provide a longitudinally disposed elongate indentation 12 which extends to the extremity of the other end for a purpose to be described later. Barrel 7 is also provided with a dimple indentation 13.

A winding assembly is provided and includes a sprocket wheel or drum 14 having a hollow elongate hub portion 15. Hub 15 has a cylindrical interior and exterior, the O.D. of the hub being very slightly less than the I.D. of barrel 7 so that the hub may be pressed into the barrel to the position shown in FIG. 2. A longitudinal slot 16 is provided in hub 15 to receive the indentation 12 in the barrel to prevent rotation of barrel 7 and hub 15 with respect to each other. A dimple indentation 17 is also provided in hub 15 to receive the indentation 13 in the barrel and act as a snap catch to prevent accidental longitudinal separation of the hub and barrel. Sprocket wheel 14 is provided with buckets 18 to receive the beads 19

of a bead type chain 20. Instead of buckets and beads, teeth and link type chain, or any other well known type of arrangement could be used.

Sprocket wheel 14 and its hub 15 are provided with a continuous cylindrical bore 21 to receive as part of the winding assembly, a supporting, guiding, and braking device 22. The braking device is a two-part structure and one part constitutes a semicylindrical elongate journal portion 23 which has its upper face 24 provided with two shallow holes 25, which holes 25 receive the lower ends of two springs 26. A complemental semicylindrical brake shoe 27 has in its lower face two shallow holes 28 to receive the upper ends of the springs 26. The outer end of portion 23 is formed as a flat upright portion 29, and also has an outwardly extending spear or flat gudgeon 30. The upper end of portion 29 terminates in an inwardly extending top portion 31 and a downwardly extending lip 32. Between the portions 23 and 29 is also formed a cylindrical journal portion 33 which has an O.D. just slightly less than the I.D. of hub 15 and the area above the flat top of 23 can be considered to be a notch.

In assembling the parts, the upper end of the shade is attached to the barrel by any suitable means; the hub of the sprocket is pressed into the open end of the barrel, with the slot 16 receiving the elongate indentation 12, and the dimple indentation 17 receiving the dimple 13. The springs 26 are then placed in the holes 23 and 27, and brake shoe 27 pressed downwardly toward journal 23 thereby compressing the springs. With the parts so located they are slid into bore 21 to the position shown in FIG. 2. It should be understood that the material of the portions 29, 31 and 32 is relatively light, so that lip 32 can snap over the periphery of sprocket 14, and it will thereafter hold the winding assembly parts from accidental separation.

In the condition of the parts as shown in FIG. 2, the spear 30 is held against rotation in the slot 4 of bracket 3, journal portion 33 and the semicylindrical lower surface of journal portion 23, act as a bearing to permit rotation of sprocket wheel 14 and hub 15 thereabout; the chain has been trained over the sprocket, and the top portion 32 serves to prevent the accidental displacement of the chain. Part 27 acts as a friction brake shoe, having its upper semicylindrical surface pressed by springs 26 against the inner surface of hub 15. It is obvious that different size springs 26 can be used depending upon the amount of brake friction desired or required.

The foregoing construction provides large bearing surfaces between the bore of the sprocket wheel, its hub, and journal 33, and the semicylindrical surface of journal 23 and thereby reduces possible wear between the parts. The large effective area of the semicylindrical surface of brake shoe 27 in contact with the hub 15 spreads the braking effect giving more consistent friction braking action.

It is, of course, obvious that the chain 20 may be of the endless type and may be pulled upon by an operator in order to wind or unwind the shade, and that a reasonable pull effort will overcome the friction brake effect, which brake effect, however, will immediately become operative upon cessation of pulling effort, to hold the shade in whatever position it had assumed at such time. Although the parts so far have been illustrated and described as being of metal and fabric, it is obvious that they can be made of plastic, or other suitable material, in whole or in part.

FIGS. 5 and 6 illustrate the same sprocket, hub, journals and friction brake construction as previously described, but applied to a wooden barrel construction 34. At one end, barrel 34 has a conventional round pin and plate gudgeon construction 35, and at its other end the barrel is provided with a hollowed out portion 36. The

previously described hub of the sprocket wheel and the friction brake unit is received in the hollowed portion 36 and retained therein by any suitable means such as an elongate key 37, disposed in the elongate slot 16 in the hub and a complemented elongate slot 38 formed in the barrel. In place of the key and slot construction used to hold the drum and barrel against relative rotation and endwise disengagement, a pin 39, shown in dotted lines, could be passed through the barrel wall into the drum 15. The operation of the parts shown in FIGS. 5 and 6 is exactly the same as in FIGS. 1–4 inclusive.

FIG. 7 illustrates a metal barrel 40 of the lock seam type of construction, having seam ends 41 and 42 which are received in the hub slot 16 to act as a key to prevent relative rotation between the barrel and sprocket wheel.

FIG. 8 shows a modified construction using a metal or plastic barrel 44 having an unbroken smooth cylindrical bore 45. In this case a sprocket wheel 46 is rigidly attached at 47 to one end of the barrel 44 by welding or any other suitable means. Wheel 46 has no hub extending into the barrel, and the journal 23 and brake shoe 27, under the influence of springs 26 (only one is shown), will bear directly against the inner surface of barrel 44 to frictionally hold the parts, but permit manually operative rotation. The assembly and operation of the device is similar to those previously described.

FIG. 9 shows a construction similar to that shown in FIG. 8, except that a wooden barrel 50 is utilized, and nails or pins 51 extending through the wheel 46 and into the barrel 50 serve to hold those parts together.

One of the important advantages of my invention is that the friction brake portion is contained within the roller or barrel, and therefore does not add to the visually observed parts, thereby making a more attractive assembly. Equally important is the fact that I have invented an improved self adjusting friction brake with a sizeable effective brake contact area, whereby a small spring or springs, such as 26, will continue to expand to maintain pressure of the brake shoe against the sleeve to compensate for wear between those parts.

It is to be understood that certain changes and modifications as illustrated and described may be made without departing from the spirit of the invention or the scope of the following claims.

I claim:

1. A roller shade assembly comprising, in combination,
an elongate barrel adapted to receive a shade in wound relation thereon,
means for rotatably supporting the opposite ends of said barrel to permit winding and unwinding of a shade thereon,
said means including a gudgeon at one end of said barrel and a winding assembly at the other end of said barrel,
said winding assembly comprising a sprocket wheel having a hollow hub projecting laterally from the wheel into said barrel, and a stationary spear having an elongate journal portion projecting into and rotatably supporting said wheel and its hub, said journal portion having a notch therein, a complementary brake shoe received in said notch, and resilient means acting between said journal portion and said brake shoe urging the latter into friction-holding contact with said hub,
and driving means engaged over said sprocket wheel for manually rotating said barrel.

2. The roller shade assembly of claim 1 further characterized by:
said sprocket wheel hub and said barrel having elongate attaching means preventing relative rotation therebetween.

3. The roller shade assembly of claim 1 further characterized by:

said brake shoe being of elongate construction providing a sizeable hub contacting surface.

4. The roller shade assembly of claim 1 further characterized by:
said stationary spear having a portion extending beside and over said sprocket wheel for preventing accidental disengagement of said chain.

5. A roller shade assembly comprising, in combination,
an elongate barrel adapted to receive a shade in wound relation thereon,
means for rotatably supporting the opposite ends of said barrel to permit winding and unwinding of a shade thereon,
said means including a gudgeon at one end of said barrel and a winding assembly at the other end of said barrel,
said winding assembly comprising a sprocket wheel having a hollow hub projecting laterally from the wheel into said barrel, and a stationary spear having a cylindrical journal portion projecting into and rotatably supporting said wheel and an elongate semicylindrical journal portion rotatably supporting said hub, an elongate semicylindrical brake shoe positioned adjacent said semicylindrical journal portion, and resilient means acting between said semicylindrical journal portion and said brake shoe urging the latter into friction-holding contact with said hub,
and driving means engaged over said sprocket wheel for manually rotating said barrel.

6. The roller shade assembly of claim 5 further characterized by:
said sprocket wheel hub and said barrel having attaching means preventing relative rotation therebetween.

7. The roller shade assembly of claim 5 further characterized by:
said stationary spear having a portion extending beside and over said sprocket wheel for preventing accidental disengagement of said driving means.

8. A roller shade assembly comprising, in combination,
an elongate barrel adapted to receive a shade in wound relation thereon,
means for rotatably supporting the opposite ends of said barrel to permit winding and unwinding of a shade thereon,
said means including a gudgeon at one end of said barrel and a winding assembly at the other end of said barrel,
said winding assembly comprising a sprocket wheel having a hollow hub projecting laterally from the wheel into said barrel, and a stationary spear having an elongate journal portion projecting into and rotatably supporting said wheel and its hub, and friction means within said barrel and acting between said journal and said hub for restraining free rotation of said barrel,
and driving means engaged over said sprocket wheel for manually rotating said barrel.

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