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SHADE ROLLER

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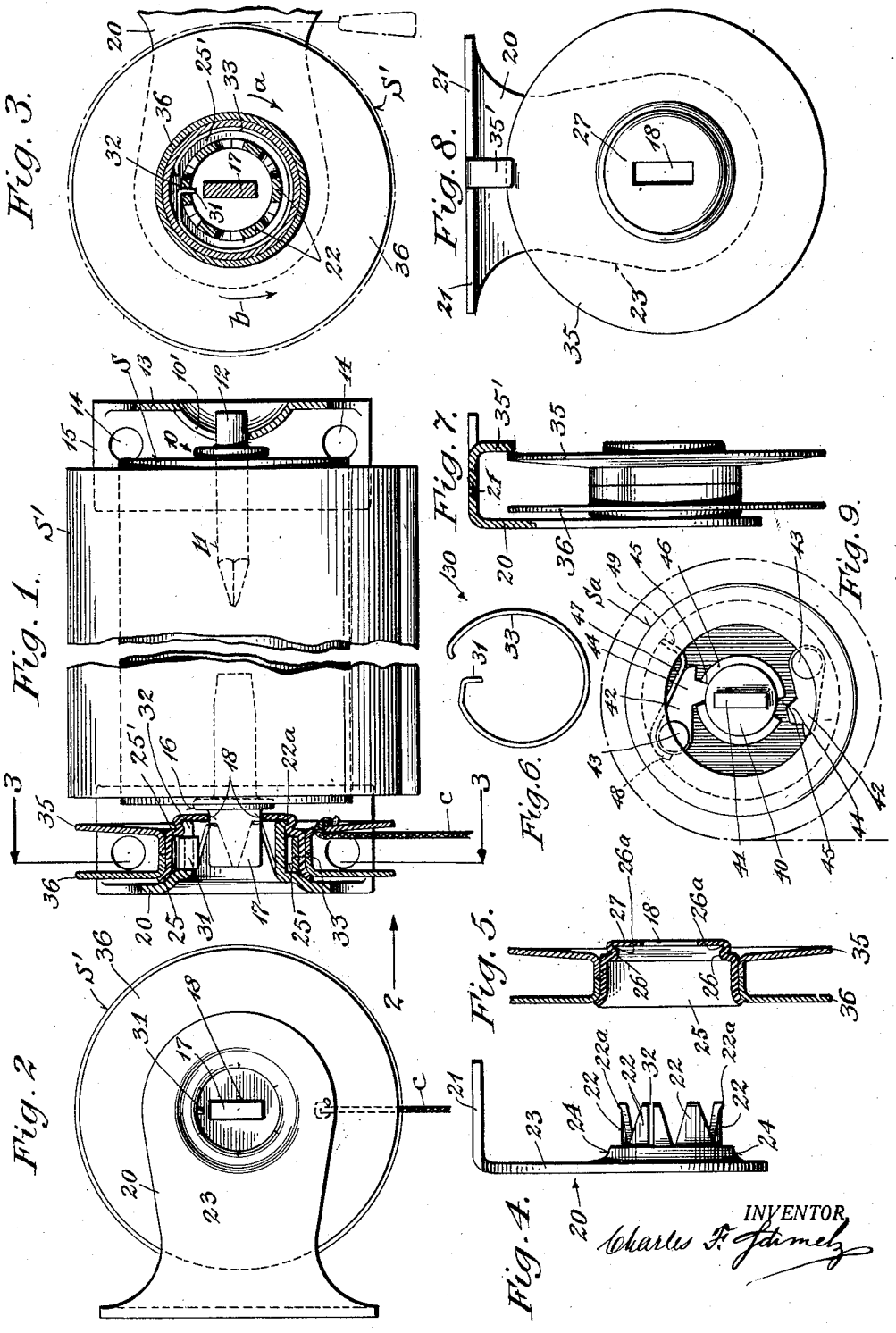

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CHARLES F. SCHMELZ, OF BRIDGEPORT, CONNECTICUT, ASSIGNOR TO STAY-PUT SHADE ROLLER CORPORATION, OF BRIDGEPORT, CONNECTICUT, A CORPORATION OF CONNECTICUT

SHADE ROLLER

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This invention relates to shade rollers, and more particularly to mechanism whereby the rotation of the roller in opposite directions, to raise or lower the shade, is controlled, and it has for one of its objects the provision of an improved device of this character whereby the rotation of the roller in one direction will be frictionally resisted, while, when the roller is being rotated in the other direction, the frictional resistance is automatically and materially relieved.

The invention has been clearly illustrated in the accompanying drawings, in which similar characters denote similar parts and in which

Figure 1 is a front view of a shade roller and its supporting bracket, the latter being shown in section.

Figure 2 shows the left-hand view thereof, looking in the direction of arrow 2 of Fig. 1.

Fig. 3 is a vertical section on line 3—3 of Fig. 1.

Figs. 4, 5, and 6 illustrate the several units of which the left-hand mechanism is composed, Fig. 4 showing the supporting bracket, Fig. 5 the combination pulley and brake drum unit, and Fig. 6 showing the brake band in its free or untensioned condition, preparatory to being placed into the brake drum.

Figs. 7 and 8 illustrate a modification in the manner of holding some of the parts together.

Fig. 9 shows an end view of a shade roller of the conventional or generally-used type arranged and adapted for use in connection with my improved mechanism.

In brief, the present device is an improved mechanism whereby a shade roller coupled thereto will firstly be held frictionally against being rotated by the down-hanging portion of the shade fabric and its appurtenances, and which will, secondly, relieve this friction when a cord, attached to the pulley or spool of the mechanism, is pulled to rotate the roller in the opposite direction to raise the shade, and the operator's hand-pull will, therefore, have to overcome only the weight of the down-hanging portion of the shade, instead of both, this weight plus the friction mentioned.

The present device is also designed to be used in connection with the spring rollers of the type which has been in general and practically universal use for many years and is still being used in large quantities.

In other words; when considering the present device in connection with its adaptation to the spring roller, it is entirely immaterial whether its spring functions properly or not, or is broken and has, therefore, rendered the roller useless. In either case, when a spring roller is to be used with my improved mechanism, the spring arbor is simply fixed so that the roller cannot rotate without carrying the arbor-tang with it, in either direction.

An exhaustive study of the situation, as far as the salvage of old shades is concerned, has revealed some important facts which, while not only interesting in emphasizing its economical advantages, also show conclusively the advisability of preserving the old rollers and the shades attached thereto without removing or handling the latter at all, or making any structural changes in the rollers and their component parts. Especially in the better grades of shades, considerable care is exercised in the installation of the shade rollers, so as not to mar or damage the window casings or the shades, themselves, when made of expensive material and decorated by hand-painting, decalcomania, etc., to produce effects which are harmonious with the character of the rooms in which they are located. Naturally, such shades are valuable, and their owners are prone to have them handled no more than necessary.

It is for these particular reasons that my improved device is so designed that it is adapted for the old type of spring rollers in general use, as well as for the simpler and solid rollers intended for it. Furthermore, the new device is adapted to replace the old fixtures already installed on the window-casing, using the same screw-holes and, if so desired, even the same screws, and bringing the shade roller into exactly the same position and fit which it had in the old fixtures. Also, the present device has the advantage that the objectionable features prevalent in the generally-used spring rollers, (such as spring-break, snapping-up of

shades, uncertainty of alinement, and wear of essential working parts) are entirely eliminated, and the spring-operated roller is converted into a friction-operated device whose length of shade is not confined or limited by any winding-up of a spring.

Referring to the drawings, the roller S consists, in its simplest form, of a plain, solid cylindrical body to which the upper end of the shade material S′ may be secured as usual, by tacks, staples or otherwise. At its right-hand end this roller is provided with a trunnion pin 10 whose shank 11 is firmly fixed in the roller: while its other end 12 is normally supported in the bracket 13 which is adapted to be secured to the casing of a window, by screws (not shown) passing thru holes provided therefor in the base plate 15 of the bracket. In order to permit the roller to be lifted out of the bracket, the latter is slotted at 10′, as usual.

The other or left-hand end of the roller is provided with a fixed tab-pin 16 whose outer end is preferably rectangular in cross section (see Figs. 2 and 3) and is adapted to be entered into, or removed from a similarly-shaped aperture 18 formed in the face of the pulley-unit whereby the roller is rotatively controlled in either direction, viz.: when the shade is pulled down by hand, as usual, or when the pulley is reversely rotated by a cord, to raise the shade.

This pulley-unit and its support constitute in this instance the essential or important part of the invention, the main object being: simplicity in construction, the greatest possible reduction in the number of the component parts, and also their easy and economical assemblage into a complete and effectively-operative device.

The supporting bracket 20 consists substantially of an L-shaped member formed from sheet metal and having its base plate 21 provided with screw-holes so that it may be attached to a window-casing. The pulley-supporting portion of the bracket consists, in the present instance, of a quasi-tubular hub which is formed or drawn from the sheet metal body by first radially slitting the metal and then bending the prongs 22 thus formed, right-angularly, so as to project from the main plate 23 in the manner shown in Figs. 1 and 3, leaving an annular shoulder 24 at their base to serve as a running-seat for the left-hand end of a cylindrical shell 25, the general inside diameter of which is such as to leave an annular space 25′ between the inner shell surface and the outer face-line of the bracket-prongs 22.

This method of prong-formation of the hub is particularly advantageous in this instance because the thickness of the metal-prongs remains practically the same as that of the original metal, in contradistinction to the "cup-drawing" method which would necessarily entail considerable stretching and consequently thinning of the supporting body. Besides this fact, the length of the prongs is limited only by the diameter of the bending-circle; while in the cup-drawing process the shell-length is less, and its terminal edge is apt to be rough and therefore to require trimming, thus making the length of the pulley-support shorter than is actually needed here.

In order to provide for supporting the right-hand end of the shell 25, the latter is crimped or beaded, as at 26, to ride on the exterior faces of the properly-curved prongs 22, and it is specifically the end-plate 27 of this cup-shaped shell 25, which is provided with the rectangular slot or aperture 18 above referred to. It will now be understood that, when the roller-tab 17 is seated within the slot 18, the roller and shell become co-rotatively coupled, in either direction; while the entire left-hand end of the roller is rotatively supported on the prong-hub 22 of the bracket.

As above-mentioned, the present invention comprises means whereby rotation of the roller by the weight of the down-hanging portion of the shade is prevented, and in the present instance this is accomplished by a brake-band 30 which is bent at one end, 31, to enter a slot 32 in one of the prongs 22 of the bracket and thus become anchored at that point; while its other end is loose or free in the space 25′ and allows the main portion 33 to adapt itself to, and frictionally engage, the inner surface of the shell 25, the latter practically constituting a brake-drum which is under considerable frictional resistance when being rotated clockwise, as per arrow *a*, but is self-releasing when it is rotated in the other direction, as per arrow *b* (see Fig. 3).

As previously stated, the shell 25 is to be rotated in the direction of arrow *b* by a cord, and a cord-spool can be readily formed by providing a pair of flanges, 35, 36 which primarily are identical and have drawn-up portions to form hubs which, when press-fitted onto the shell (as shown in Figs. 1, 5 and 7) form an adequate space for receiving spooled-up cord *c* whose end is knotted exteriorly of the flange 35, as shown in Fig. 1. In order to increase the cord-space, I prefer to dish the flange 35 and therefore also lessen the liability of the cord being caught and deflected by the flange during the reeling-on process. In addition to press-fitting the flange-hubs on the shell 25, spot-welding may be employed to form the pulley, brake-drum, and shell into one single inseparable unit which is rotatably supported on the single support-unit 20, and frictionally controlled by the single brake-band unit 30, a total of three pieces which may be easily and quickly assembled.

Means are provided for holding the three units together, as a single article of manufacture which may be shipped and used without danger of becoming dissembled. While this object may be attained in different ways, I prefer to use the construction illustrated in Figs. 1, 4 and 5 in which the shell-head 27 is slightly counter-crimped, as at 26*a*, to provide what may be termed an "annular channel" adapted to receive the ends of the bearing-prongs 22 whose extreme outer ends are slightly upset outwardly, as at 22*a*, and, when in place within the channel, will hold them against longitudinal movement thereon. The amount of this prong-end channel-engagement is, in practice, very slight and will permit the entire spool-unit to be forced-off, because there is sufficient resiliency in the prongs to allow the required small "give" without destroying the natural resiliency of the metal, even if the latter is soft or annealed. Likewise, and for the same reason, the spool-unit may be easily placed onto the prongs and become sufficiently locked to hold the parts together against accidental separation.

In Figs. 7 and 8 I have illustrated a modification in which the bracket-base is slitted to form a tab 35′ adapted to be bent-over, as shown in Fig. 7, to engage the outer spool-flange 35 and thus hold the parts together. This tab will also serve as a guard to prevent the cord from flying out of the cord-space between the flanges. In either case, the holding-member is a part of the main bracket, but it should be distinctly understood that the exploitation of the device is not at all limited to the particular construction shown and described.

From the above it will now be understood that my improved device consists of only three individually-complete and independently-formed units, viz: the supporting bracket 20, the combination brake-drum and pulley rotatable on the bracket, and the brake-band anchored to the bracket and engaging the brake-drum. Furthermore, the three units are removably held together against accidental separation by one or more holding members integral with the bracket, so that no extraneous means need be employed to perform that function.

In actual practice, the supporting brackets 13 and 20 are formed from sheet metal by punch-and-die process, the stampings thus obtained possessing great stability and being quickly and inexpensively manufactured.

Of the three components of the combination pulley-and-brake drum unit, the hubbed flanges 35 and 36 are identical in material and size, the only difference being a slight dish in the flange 35 only, the other flange (36) being straight, to bring the left-hand hub of the pulley-shell 25 as near to the root of the bracket-hub as possible, and there being plenty of room at the right-hand end of the shell to permit flaring of the flange without interfering with its free operation. On the other hand, if so desired, both flanges 35, 36 may be formed exactly alike and assembled, as described, on and with the shell 25, the latter being also made of sheet metal and by the stamping process. The third unit, viz.: the brake-band 33, is made of spring steel such as is commonly used for clock and watch springs, the degree of friction produced by it on the inner surface of the brake-drum depending, of course, upon the gage and temper of the band-metal.

In the above description, the roller S′ has been described as being a plain, solid cylindrical body which is provided at its left hand end with the rectangular pin 17 adapted to enter the slot 18 of the pulley hub 27. In order to adapt the present device for use in connection with the conventional type of spring rollers, the tab 17 is made of the same size as that of the spring roller S*a* (see Fig. 9). Here the shade roller S*a* is of the conventional and generally-used type, and comprises the spring-arbor 40 to which one end of a spring (not shown) is secured and which has a flattened or oblong tang 41 whereby the roller is co-rotatively connected with my improved device above described.

The roller is provided at its operating end with a pair of gravitative dogs 42 pivoted at 43 and having tabs 44 adapted to enter notches 45 formed in the arbor-flange 46, as shown, all the parts described being well-known and in general use at the present time.

As above stated, my improved operating device disregards the roller-spring or its normal function. If the spring is in working order, it will be only necessary to wind it up tight and let one of the dogs 42 enter one of the notches 45, the spring and roller becoming thus effectively locked together for co-rotation. On the other hand, if the spring should be broken, the same locked condition can readily be effected in the manner shown in Fig. 3, where the upper dog 42 is firmly held with its tab 44 engaging the notch 45 by a shoe or clip 47, one end of which (48) is bent around the heel of the dog, while its other end 49 is bent to engage the inner wall of the recess or chamber formed in the roller-end and its ferrule for the reception of the parts just mentioned.

Of course, it should be understood that any other suitable locking means may be employed in lieu of the shoe-clip 47.

Changes may be made in the organization as well as in the particular construction of the elements of my improved device, it being obvious that, while the brackets shown and described are of the "outside fixture" variety, their bases will have to be modified to meet the requirements of the "inside fixtures".

I claim:

1. A device of the character described comprising a bracket having a hollow hub, a spool rotatable thereon, means for frictionally resisting such rotation in one direction and self-relieving in the other direction, said means being disposed between the co-operative surfaces of said hub and spool, and a plate on the spool-hub having an aperture adapted to receive a coupling member carried by a roller to be operated thereby.

2. A device of the character described comprising a bracket having a hollow hub, a spool having a hollow hub provided with an inwardly projecting annular flange, rotatably supported on the outer surface of said bracket-hub, means for frictionally resisting the rotation of said spool in one direction, and means for coupling a roller to said spool.

3. A device of the character described comprising a bracket having a shouldered hollow hub, a spool having a tubular hub supported at one end on said bracket-shoulder and provided with an inwardly-projecting flange for rotatably supporting the other end of said spool-hub in spaced relation on the bracket-hub, and a brake-band anchored with one end on the bracket-hub and having its free main portion in frictional engagement with the interior surface of said spool-hub.

4. A device of the character described comprising, as complete and independently formed components, three individual elements, viz: a supporting bracket, a combination-pulley-and-brake-drum rotatable on the bracket, and a brake band having one end anchored on the bracket and having its other free end frictionally engaging the brake drum surface, the bracket having integral portions for holding the three elements together against accidental separation.

5. A device of the character described comprising a supporting bracket having prongs projecting therefrom to form a quasi-cylindrical hollow hub, a cup-shaped shell rotatable on said hub and having flanges to form a cord-spool, and a brake band having one of its ends anchored on one of said prongs and having its other end frictionally engaging the interior of said shell.

6. A device of the character described comprising a supporting bracket having prongs projecting therefrom to form a quasi-cylindrical hollow hub, the ends of said prongs being up-set outwardly, a cup-shaped shell rotatable on said hub and having an annular crimped channel to receive said up-set prong-ends for holding such shell on the hub, and a brake band having one of its ends anchored on one of said prongs and having its free portion frictionally engaging the interior of said shell.

CHARLES F. SCHMELZ.