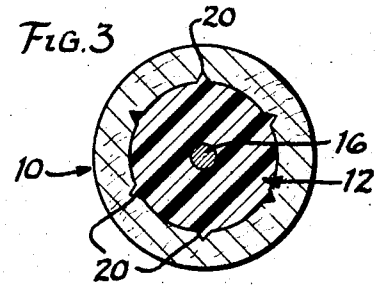
Jan. 9, 1968 M. H. STARK 3,362,461

SHADE ROLLER

Filed Oct. 24, 1965

FIG. 3



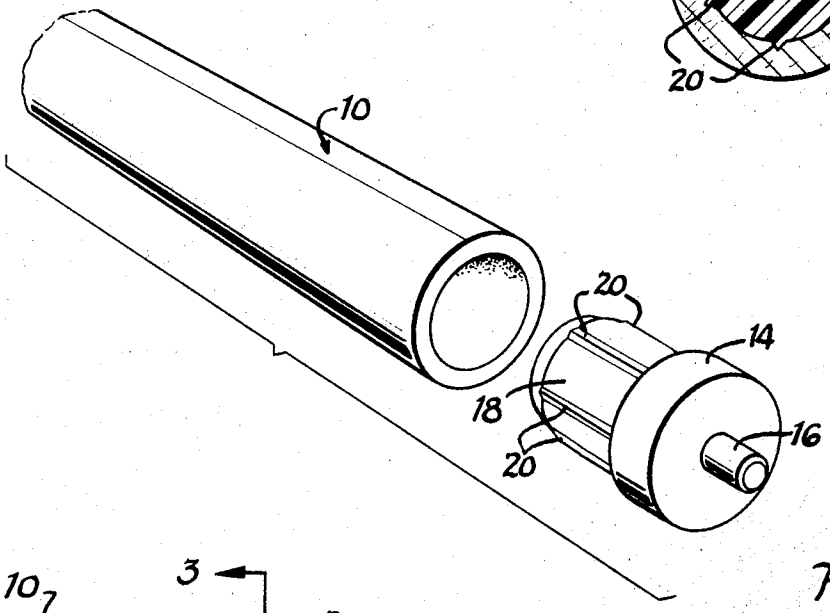


FIG. 1

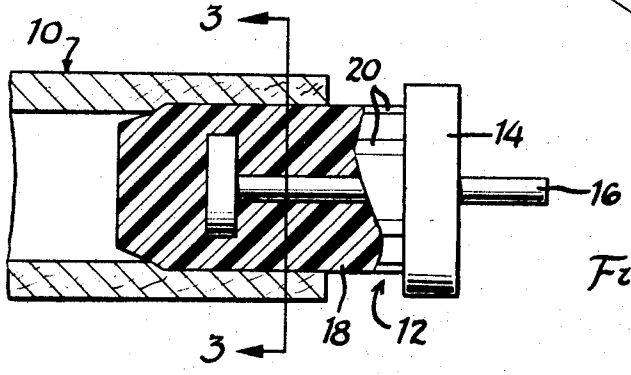


FIG. 2

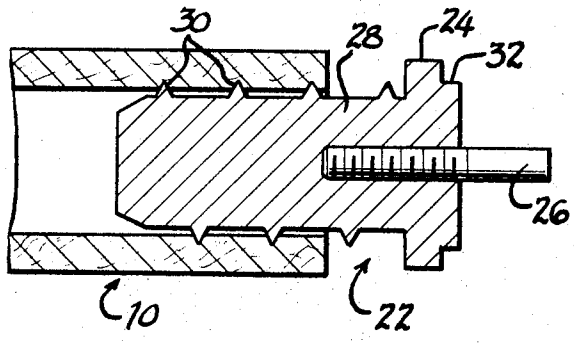


FIG. 4

INVENTOR.
MARTIN H. STARK
BY
WILSON, SETTLE & CRAIG
ATTORNEYS

United States Patent Office 3,362,461 Patented Jan. 9, 1968

3,362,461

SHADE ROLLER

Martin H. Stark, 223 N. Porter, Saginaw, Mich. 48602

Filed Oct. 24, 1965, Ser. No. 504,428
1 Claim. (Cl. 160—323)

ABSTRACT OF THE DISCLOSURE

The disclosure is for a window shade roller assembly with the shade roller being fabricated of laminated paper and an end unit of molded construction to be received in the holder and have provisions for adjusting the length of the assembly.

This invention relates to window shade roller assemblies and more particularly to shade rollers fabricated of laminated paper and end assemblies especially adapted for use with such rollers.

The invention is especially directed to window shade roller assemblies wherein the roller element of the assembly is constructed from a convolutely wound paper sheet which has the convolutions adhesively bonded to each other. Such rollers are readily manufactured by winding a sheet of paper material impregnated or coated with adhesive upon a mandrel. Rollers possessing the necessary structural rigidity can be conveniently formed in this manner by techniques well known in the paper tube making art.

In the usual case, the rollers are manufactured in a number of standard lengths. Because of minor variation in window dimensions, it is frequently necessary to trim a standard length roller to fit a window frame in which it is to be used. The rollers are conventionally sold with a spade cap and torsion spring mounted in one end and bearing at the other end an end cap through which a round pivot pin is driven into the roller. To trim the roller to length, the end cap carrying the pivot pin is removed and trimming is done at that end of the roller.

Summary of the invention

In accordance with my invention I provide a shade roller which is formed of laminated paper with a hollow interior for receiving an end cap. Preferably the end cap is a molded one piece solid plastic article with a plurality of radially projecting ribs axially extending on the end cap. The end cap includes a flange with the ribs being positioned on one side of the flange and a support pin positioned or embedded in the end cap and projecting from the flange on the side opposite the ribs. The support pin also includes an enlarged head embedded in the plastic end cap to provide adequate engaging surfaces to prevent rotation or accidental removal from the end cap. A modified form includes a screw thread on the outer surface of the end cap. By constructing the roller of laminated paper it is possible to insert the end cap into the hollow end of the paper rollers with very little effort and the ribs engaging the paper are adequate to prevent rotation of the end cap relative to the roller.

Accordingly, it is an object of the invention to provide a window shade roller assembly employing a wound paper roller having a pivot pin carrying end cap which is capable of axial adjustment relative to the roller.

Other objects and features of the invention will become apparent by reference to the following specification and to the drawings.

In the drawings:

FIG. 1 is an exploded perspective view of one embodiment of the invention;

FIG. 2 is a cross sectional view in an axial plane of the embodiment of FIG. 1 in an assembled position;

FIG. 3 is a transverse cross sectional view of the assembly of FIG. 2; and

FIG. 4 is an axial cross sectional view of a modified form of the assembly of FIG. 2.

Referring first to FIG. 1, there is shown one end of a window shade roller formed from a convolutely wound sheet of paper, the convolutions of which are adhesively bonded to each other. The roller member **10** is formed by cutting a sheet of paper to a width equal to the desired axial length of the roller and to a length sufficient to achieve the desired thickness or number of convolutions or layers in the completed tube. One side of the paper is coated with adhesive with the exception of an initial portion lengthwise of the paper sufficient enough to provide a tab for insertion into a slot of a winding mandrel (not shown) and to wrap at least once around the mandrel so that no adhesive is exposed to the mandrel surface. The sheet is then tightly wound upon the mandrel and, upon removal, provides an elongate hollow cylindrical tube.

An end cap or fitting designated generally **12** is, in the FIGS. 1 through 3 embodiment, formed of a molded plastic or metal material having a circular flange **14** of an outer diameter substantially equal to the outer diameter of the roller member **10**.

As best seen in FIG. 2, a metal pivot pin **16** is molded into fitting **12** to project coaxially from one side of flange **14**. Integrally molded with flange **14** is an axially extending plug portion **18** which projects from the opposite side of flange **14**. Plug **18** has an outer diameter substantially equal to or slightly less than the internal diameter of roller member **10** so that the plug portion can be inserted into the interior of the roller member in the manner illustrated in FIG. 3.

A plurality of relatively sharp edged axially extending ribs **20** are molded upon plug portion **18** and project radially outwardly from the periphery of the plug. As best seen in FIG. 3, the ribs are adapted to cut into or be frictionally embedded in the interior wall of roller member **10**. The frictional grip of the tube upon the ribs **20** is sufficient to frictionally lock end cap **12** at a selected position of axial adjustment relative to the tube, thus axially locating the outer face of flange **14** and the projecting pivot pin **16** to establish the desired length of the roller assembly. It will be appreciated that a conventional spade and torsion spring assembly (not shown) will be mounted in the opposite end of roller member **10**.

In FIG. 4, a modified form of end cap or fitting is disclosed. In the FIG. 4 embodiment, the end cap **22** takes the form of a metal or plastic element formed with a flange **24** in which is threadably received a projecting pin **26**. The plug portion **28** in the FIG. 4 embodiment is formed to an outer diameter somewhat less than the internal diameter of the tube. In the FIG. 4 embodiment, the relatively sharp edged rib takes the form of an external screw thread which projects radially from the plug portion by a distance sufficient to cut into the inner wall of tube **10** when fitting **22** is threaded into the tube. Flange **10** may be formed with a pair of opposed flaps **32** to received a wrench to assist in the threading operation. As in the FIGS. 1 through 3 embodiment, the frictional grip of the tube upon the projecting rib or thread **30** is sufficient to frictionally lock the end cap or fitting at the desired position of axial adjustment, thereby accurately fixing the length of the shade roller assembly.

The axial length of the alternate forms of embodiments disclosed is relatively short, since the primary purpose of adjustability of the fitting is to avoid the necessity of trimming the roller where only a relatively small adjustment or reduction in length is desired. In the usual case,

the rollers are sold in standard lengths which match up quite closely to standard sized window frames and the end caps or fittings disclosed above permit a final adjustment to accurate length without the necessity of trimming. Where the range of adjustment required is beyond that obtainable by axially positioning the end cap, it will be necessary to trim the roller roughly to length and make the final adjustment by positioning of the end cap.

While I have disclosed two embodiments of my invention, it will be apparent to those skilled in the art that the disclosed embodiments may be modified. Therefore, the foregoing description is to be considered exemplary rather than limiting and the true scope of the invention is that defined in the following claim.

I claim:

1. A window shade roller assembly comprising a convolutely wound sheet of paper, the convolutions of said sheet being adhesively bonded to each other to define a rigid elongate multi-layer cylindrical roller member, a molded solid one piece end cap having a circular flange of a diameter substantially equal to the outer diameter of said roller member, a roller support pin fixed in said flange against movement relative thereto and extending from one side thereof to form the sole support beyond said flange, a reduced diameter plug portion formed on the other side of said flange and adustably received within the interior of said tube, said plug having a relatively small tapered end and a plurality of sharp edged ribs positioned radially on the outer edge of the plug with each rib extending longitudinally thereon from the flange to the tapered end and deforming the inner wall of said paper tube to lock said end cap against rotation relative to the tube at a selected position of axial adjustment, said ribs are equally spaced about the periphery of said plug to guide the end cap in a straight path on making adjustment of the end cap and the support pin having an enlarged head completely surrounded by the molded plug to lock the pin against movement in any direction.

References Cited

UNITED STATES PATENTS

320,247	6/1885	Hartshorn	160—325 X
3,099,916	8/1963	Rosenbaum	160—323
3,248,899	5/1966	Anderson	160—326 X

DAVID J. WILLIAMOWSKY, *Primary Examiner.*

PETER M. CAUN, *Examiner.*