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**ROLL SUPPORTING ARBOR**

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This invention relates to an arbor for rotatively supporting a roll of strip material. The invention has particular application to mounting a toilet paper roll in a conventional dispenser but is not to be considered limited to such application.

Prior art roll supporting arbors of which I have knowledge have certain disadvantages. The typical wooden roller that has two telescoping parts and extends entirely through the opening in the toilet paper roll spool is extremely difficult to install and remove, especially in the type of roll holding fixture recessed in a wall. Bruised fingers and broken finger nails frequently result from the use of a device of this sort. A further disadvantage is that because the outside diameter of the roller is so much smaller than the inside diameter of the cardboard spool opening, the paper roll can freely rotate so as to cause an overrunning which results in dispensing excessive paper. The difference in diameter of the roller and the cardboard spool also leads to noise or chatter if the roller is unwound at an excessive speed. Moreover, the appearance of the conventional roller is not aesthetically pleasing because the ends of the cardboard spool are visible.

Therefore it is an object of this invention is provide an arbor for a roll of strip material, which arbor is easily installed in and removed from a conventional dispenser. This object is realized by providing an enlarged shoulder on the end of the arbor upon which finger pressure can be applied to effect withdrawal of the arbor from the dispenser. Such shoulder is sufficiently remote from the point of contact between the arbor and the dispenser to avoid injury to the finger.

Another object is to provide an arbor that firmly secures the roll against radial displacement relative to the axis of rotation. This object is obtained by providing two substantially identical arbor halves, each one of which snugly fits into an opposite end of the spool opening of the roller.

Still another object is to provide an arbor of the type contemplated that completely conceals unattractive cardboard spools on which many strip paper products are wound. Attainment of this object is accomplished by providing on each arbor half a flat annular flange that covers the end of the cardboard spool. The flange also serves to restrict axial movement of the roll relative to the dispenser and to the arbor.

A feature and advantage of the present invention is that the arbor is formed of two identical halves, as a consequence of which manufacturing costs are materially reduced.

Another feature and advantage of the present invention is the provision of an arbor half in the form of only three inexpensive, easily formed, sturdy parts.

The specific embodiment of the present invention to be described in detail hereinafter comprises an arbor for mounting rolled material in a dispenser of the type formed with two spaced apart opposed arbor receiving sockets, which arbor includes two substantially identical halves; each half having a housing adapted to be received in the end of the cardboard spool upon which the paper or other strip material is wound, a plunger telescoped in a bore in the housing, which plunger has a boss adapted to be received in a dispenser socket, and a compression

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spring for urging the plunger axially outward relative to the housing.

The foregoing objects, features and advantages as well as others will be apparent from reading the following specification and attached drawings in which:

FIGURE 1 is a cross sectional top view of a typical toilet paper dispenser with the arbor of the present invention installed therein;

FIGURE 2 is a cross sectional view of my novel arbor taken along line 2—2 of FIGURE 1; and

FIGURE 3 is a cross-sectional view of my improved arbor taken along line 3—3 of FIGURE 1.

Referring more particularly to the drawing, reference numeral 12 indicates generally a conventional toilet paper dispenser recessed in a wall 14 and having two parallel spaced apart members 16 and 18 forming opposed concave sockets 20 and 22, respectively. In a conventional manner arms 16 and 18 are spaced apart sufficiently to receive freely therebetween a roll of toilet paper R or the like. Roll R includes an elongate strip of paper 24 spirally wound about a hollow cardboard spool 26 of conventional size. Inserted in each end of spool 26 are substantially identical arbor halves indicated generally as A and B.

Arbor half A includes a housing 28 formed with an internal bore 30, a plunger 32 telescopically slidable in the bore, and a compression spring 34 for biasing the plunger toward the left as viewed in FIGURE 1. The housing is sized to extend into spool 26 by an amount less than one-half the length of the spool. Housing 28 is formed with an external cylindrical surface 36 which has a diameter slightly smaller than the internal diameter of spool 26 to afford clearance and free entry of the housing into the spool opening. At the outer end of housing 28 is an annular flange 38 having a diameter at least sufficient to conceal the end of spool 26. The outer diameter of flange 38 is preferably made slightly greater to impart added structural rigidity to the housing. Extending from cylindrical surface 36 are a plurality of protrusions 40, which protrusions extend in a radial direction by an amount sufficient to frictionally engage the interior surface of spool 26. I prefer to provide three protrusions 40 because such number permits convenient installation and removal of the arbor while simultaneously affording sufficient friction between the housing protrusions and the spool to prevent relative rotation between the two. The maximum height of the protrusions above cylindrical surface 36 is preferably such to slightly distort spool 26 when the arbor is inserted therein. It is desirable that protrusions 40 extend along cylindrical surface 36 from the end of the cylindrical surface adjacent flange 38 to a point intermediate the ends of the housing. A tapered portion, as at 42, on protrusions 40 expedites insertion of the housing into the spool. Bore 36 is bottomed at 44 interior of housing 28 and is formed adjacent the bottom thereof with a pair of lips 46 for affixing spring 34 to housing 28. Adjacent bottom 44 are formed a pair of openings 48 communicating the exterior of housing 28 with bore 30. Openings 48 afford finger access to the bore to permit installation of spring 34 during manufacture of the device and during repair, if such subsequently become necessary.

Plunger 32 has a cylindrical side surface 50 of a diameter sufficient to afford a telescopically sliding fit relative to bore 30 of housing 28. The outer end of plunger 32 has a cylindrical boss 52 extending therefrom for receipt in socket 22 of dispenser 12. Between cylindrical surface 50 and boss 52 a rounded sloping shoulder 54 is provided on the end of the plunger, which shoulder constitutes an important aspect of the present invention in that it provides an area of sufficient size for the applica-

tion of finger pressure thereto necessary to move the plunger into the housing bore. Because bore 30 is of maximum practical diameter with respect to the internal diameter of spool 26, the diameter of plunger 32 is maximized and consequently the area of shoulder 54 is adequate for the stated purpose.

The interior of the plunger is formed with a bore 56 that communicates with the interior of bore 30 and is adapted to receive the outer end of compression spring 34. Bore 56 is bottomed at 58 and is provided with opposing lips 60 extending from the bore surface adjacent to the bottom of the bore. One or more access openings 62 are provided near bottom 58 to communicate cylindrical surface 50 with bore 56, which openings permit access to effect engagement of spring 34 with lips 60.

Although the above description is concerned with arbor half A, it is to be understood that it would have equal application to arbor half B, since the two are substantially identical.

Although housing 28 and plunger 32 can be constructed of any suitable material, from both a cost and appearance standpoint, I prefer to construct them of molded plastic, which can be provided in any desired color. In assembling the parts, compression spring 34 is first inserted into plunger bore 56 and is engaged behind lips 60, which operation is simplified by the existence of access hole 62. The plunger and spring are then inserted into housing bore 30 and the opposite end of spring 34 is engaged between lips 46 and bottom 44 such as by inserting pliers or the like through access opening 48. Two arbor halves assembled as described above are then inserted into opposite ends of hollow spool 28 until the inner face of flange 38 bears against the side surface of roll R. Thus it is seen that flanges 38 limit the axial movement of the housing relative to the roll. The roll can now be easily inserted into dispenser 12 by placing the index finger upon shoulder 54 to depress plunger 32 axially into bore 30. Because of the size of shoulder 54, the index finger will not be injured by pinching between boss 52 and socket 22 or between cylindrical surface 50 and bore 30.

When paper 24 is exhausted from spool 26, the latter may be readily removed by reversing the foregoing steps. Finger pressure against shoulder 54 depresses plunger 32 sufficient to clear boss 52 from the dispenser sockets. When the exhausted spool has been removed from the dispenser, arbor halves A and B are withdrawn axially from the spool and may be inserted into a new roll.

The use of a toilet paper roll in the foregoing description is merely by way of example, and I wish it understood that my novel arbor can be used for any roll material wound on a spool for mounting in a similar dispenser.

While one embodiment of my invention has been shown and described it will be obvious that other adaptations and modifications can be made without departing from the true spirit and scope of the invention.

I claim:

1. In a dispenser for rolled strip material that is coiled upon a hollow cylindrical spool and wherein said dispenser is formed with a pair of spaced apart opposed sockets for receiving said cylindrical spool therebetween, a pair of substantially identical arbor forming members receivable in opposite ends of said spool for mounting said spool for rotative movement between said sockets, each said arbor forming member comprising: a housing having one end formed with a cylindrical exterior surface for receipt in one end of said hollow spool and an internal bore communicating with the opposite end of said

housing, said housing having an annular flange adjacent last said end for limiting axial movement of said housing relative said spool, said housing being sized to enter said spool by an amount at most equal to half the length of said spool, a plurality of protrusions on said cylindrical exterior surface for frictionally engaging said hollow cylindrical spool interior thereof, a plunger telescopically disposed in said bore, said plunger being formed on the outer end thereof with a cylindrical boss adapted to be received in said dispenser socket, and a compression spring in said bore for biasing said boss into said socket.

2. The invention according to claim 1 wherein said plunger is formed with a shoulder surrounding said boss, said shoulder forming an area for application of finger pressure to permit depression of said plunger into said bore against said spring.

3. The invention according to claim 1 wherein the plunger of each said arbor forming member is formed with a bore for receiving said compression spring therein, said bore being substantially coaxial with and opening into said housing bore.

4. The invention according to claim 3 including means for affixing respective ends of said compressing spring in said housing bore and said plunger bore, each said affixing means including at least one protuberance on the surface of the respective bore.

5. The invention according to claim 4 wherein said plunger and said housing are each formed with an opening communicating the exterior thereof with respective bores for affording access to said compression spring and said spring affixing means.

6. In a dispenser having a pair of spaced apart opposed sockets for receiving therebetween a roll of toilet paper spirally wound on a hollow cylindrical spool, a pair of substantially identical arbor forming members for supporting said roll for rotation about an axis thru said sockets, each said member comprising: a housing having an inner end and an outer end, said housing being formed between said ends with a cylindrical surface sized for free entry into an end of said spool, said housing also having an annular flange at the outer end thereof for limiting axial movement of said housing relative said spool, said housing further having means on said cylindrical surface for frictionally engaging said spool interiorly thereof and a bore coaxial with said cylindrical surface, said bore forming an opening in said outer end, a plunger in telescopic relation with said bore, said plunger having a cylindrical boss for running engagement in said dispenser socket, said plunger having a bore therein communicating with and coaxial with the housing bore, and a compression spring in said bores for biasing said boss into engagement with said socket, said plunger being formed with a shoulder surrounding said boss forming an area for finger pressure against said spring whereby insertion of said arbor forming members into opposite ends of said spool forms an arbor for rotatably supporting said roll in a dispenser.

#### References Cited by the Examiner

##### UNITED STATES PATENTS

2,201,052	5/40	Parsons	242—55.53
2,253,664	8/41	Vigo	242—55.53
2,889,122	6/59	McConnell	242—55.2
2,988,283	6/61	Garfield	242—55.2

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