Feb. 12, 1935. I. H. J. ELLSWORTH 1,990,860

STOCK ROLL

Filed June 30, 1933

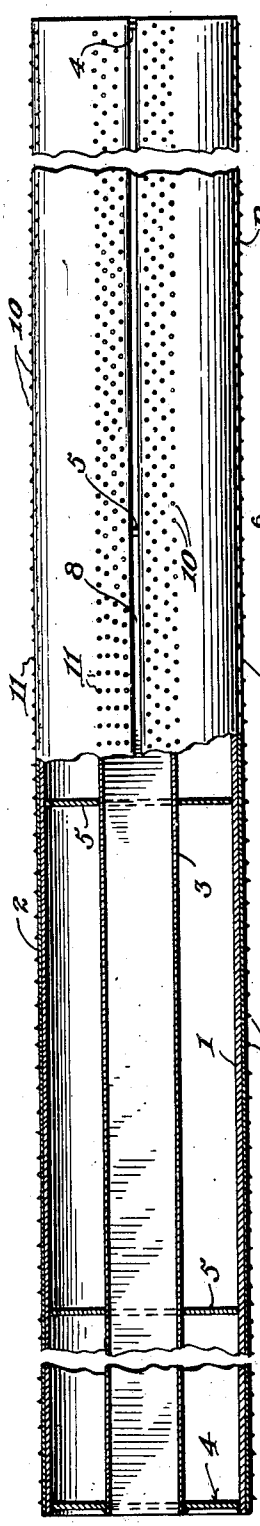


Fig. 1.

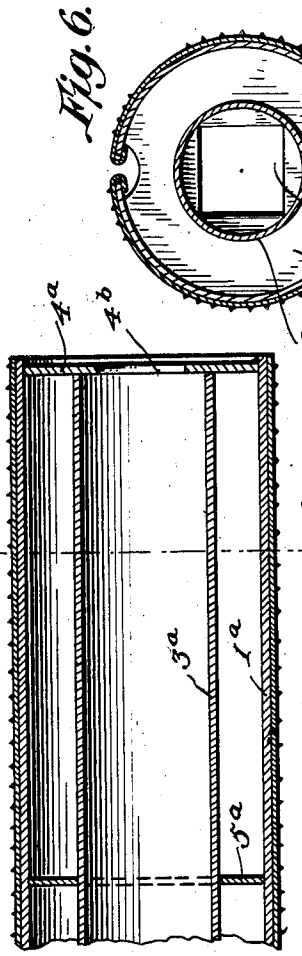


Fig. 3.

Fig. 6.

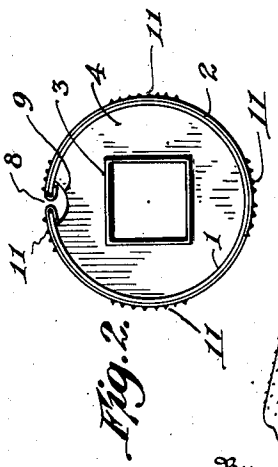


Fig. 2.

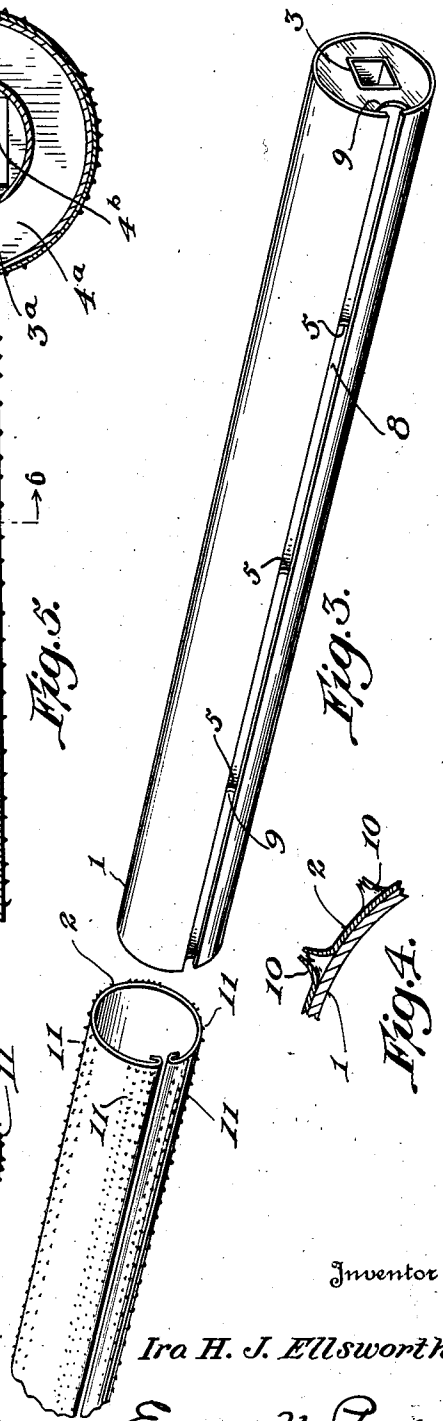


Fig. 5.

Fig. 4.

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Patented Feb. 12, 1935

1,990,860

UNITED STATES PATENT OFFICE

1,990,860

STOCK ROLL

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Application June 30, 1933, Serial No. 678,503

4 Claims. (Cl. 242—68)

This invention relates to stock rolls particularly of the type used in factories and textile mills for winding relatively wide sheet material such as cloth, paper or rubberized fabric. An important object of the invention is to provide a roll having means upon its circumference for effecting engagement of the sheet material with the roll while the roll is in motion and for eliminating appreciable slippage of the material upon the roll.

One form of stock roll in extensive use at the present time is composed of wood having a hollow metal core adapted to accommodate a square driving shaft or mandrel for rotating the roll. Such a roll is not entirely satisfactory, however, for the reason that its surface soon wears smooth making it necessary when starting the winding of stock thereon to rotate the roll slowly by hand until sufficient material has been wrapped upon the roll to cause it to bind thereon without slipping before the mandrel is connected to a source of power for winding the remainder of the stock at regular machine speed. Not only is this a slow and laborious task, but wooden rolls are also objectionable because they do not satisfactorily withstand the rough usage to which they are ordinarily subjected in service. Not infrequently after a comparatively short period of use the rolls exhibit signs of warping, cracking or splintering, which defects, if they escape the timely observation of the attendant, result in the uneven winding of the material and often cause injury to the material. While an attempt has been made to overcome these objections by covering the surfaces of the rolls with cloth facings, this has not been successful since the facings quickly wear away requiring frequent replacement.

Stock rolls made of metal have also been used to some extent and while presenting a more durable construction compared with wooden rolls the smooth polished surface of the metal rolls have, up to this time, required the provision of some manipulative means for attaching the end of the material to the roll to avoid excessive slippage during winding, and such means have generally proved relatively troublesome and time-consuming in their operation.

My invention aims to overcome the above objections by providing a stock roll of rigid construction on which the stock can be easily started at the beginning of a winding operation. For accomplishing this purpose the roll is provided upon its circumference with a multitude of small projecting points or tines, against which the material may be pressed while the roll is in motion and which cause the material to adhere to the roll without substantial slippage.

According to the preferred form of my invention, the roll is composed of a metal cylinder which is free from splitting, warping and splintering as may occur in the case of wooden rolls, having a removable circumferential sleeve provided with points defining in effect a series of roughened areas spaced about the circumference of the sleeve the arrangement being such that as the points of the roughened areas become dull and worn, the sleeve may be removed from the roll and a new one inserted to take its place. Preferably the construction is such that the sleeve may be slid lengthwise upon and in interlocking engagement with the roll to prevent relative rotation therebetween.

The invention will be better understood from the following detailed description of a stock roll representing a preferred embodiment of the invention, reference being had to the accompanying drawing in which:

Figure 1 is a side view of the roll in part sectional and in part elevational;

Figure 2 is an end view of the roll of Fig. 1;

Figure 3 is a perspective view of the roll with the sleeve shown removed;

Figure 4 is a fragmentary view of the sleeve showing the shape of the projections constituting its roughened area;

Figure 5 is a cross-section of one end of a modified form of stock roll; and

Figure 6 is a transverse cross-section of the roll taken on the line 6—6 of Fig. 5.

Referring to Fig. 1, the stock roll R comprises a metal winding cylinder 1 provided with an outer circumferential sleeve 2 snugly encircling the same. Extending longitudinally through the center of the cylinder is a hollow metal tube 3 of square cross-section having its ends passing through and supported within openings in end plates 4. The ends of the metal tube are welded to the end plates and the end plates are in turn welded to the interior of the cylinder 1. For supporting the intermediate portion of the tube 3 there is provided a series of spacer plates 5 surrounding the tube and arranged at spaced intervals upon the interior of the cylinder, to which they are suitably welded. The tube 3 is of a shape corresponding to but slightly larger than the mandrel which is adapted to be passed therethrough when the roll is placed in the machine and the tube acts as a guide for facilitating the introduction of the mandrel through the roll. The mandrel customarily has a pulley mounted upon

one of its ends for engagement with a driving belt for rotating the roll.

Extending lengthwise along the circumference of the cylinder 1 and completely through its wall is a straight slot 8. The peripheral portions of the end plates 4 and the spacer plates 5 adjacent this slot are formed with notches 9, as best shown in Figs. 2 and 3, so as to afford a clearance passage through the cylinder immediately below the slot.

The sleeve 2 is made of a section of relatively thin metal rolled into cylindrical shape to embrace the cylinder 1 and having its ends brought together and then reversely bent so as to form hooks engaging the opposite walls of the slot 8. These hooks together in cross-section define a T-shaped key member which passes through the slot and locks the sleeve to the cylinder. By this construction the sleeve is prevented from turning upon the cylinder but may be removed from the cylinder and replaced thereon by sliding it longitudinally along the cylinder, as indicated in Fig. 3.

Upon a perfectly smooth metal roll, stock cannot be satisfactorily wound because the inner convolution of the material has a tendency to slip upon the almost frictionless surface of the roll. Therefore in the past when material has been wound upon metal rolls it has been the customary practice to provide means for locking the end of the material to the roll before starting to wind. This ordinarily requires so much time that the machine with which the roll is associated, as for example a textile machine, must be stopped to prevent an excessive amount of material from feeding out of the machine during the period in which the end of the material is being attached to the roll. According to my invention I am enabled to avoid interrupting the operation of the machine while changing over from one roll to another by providing means for quickly engaging the end of the material with the roll during its rotation. To this end the sleeve 2 is provided with a series of roughened areas 11 spaced about its circumference, each area being composed of a multitude of upstanding points 10 arranged in rows extending lengthwise of the sleeve as best shown in Fig. 3. These points desirably may be produced by pricking the sleeve from its interior outwardly with an awl or other sharp instrument to form small apertures surrounded by short tines or burrs which, when the material is pressed down upon the sleeve at the beginning of a winding operation, embed themselves in the material—but not sufficiently far so as to cause injury thereto—and cause it to cling to the sleeve without slipping as the winding proceeds. These projections are shown on an exaggerated scale in the enlarged fragmentary view of Fig. 4. Because of the short interval required for making attachment of the material to the roll the machine may be maintained in operation while one roll is being replaced by another in the machine. After the end of the material has been attached to a newly inserted roll, the attendant gives the roll a spin to take up the slack material that has been playing from the machine, and the roll is then connected to power to automatically continue the winding.

From time to time as the projections upon a sleeve become worn and lose their gripping power, the sleeve may be stripped from the cylinder in the manner which has already been described and a new sleeve may be introduced upon the cylinder in its place. In this way it is not necessary to withdraw a whole roll from service for renewing the points upon its circumference.

In Figs. 5 and 6 is shown another form of stock roll differing in minor details from the stock roll which has just been described. In the form of roll shown in these figures, 1*a* represents the metal cylinder and 2*a* the sleeve corresponding to the cylinder and sleeve of Figs. 1 to 3. Instead of providing the cylinder with an axial tube of square cross-section, as in the first-described form of roll, in this roll the axial tube 3*a* is of enlarged circular cross-section and abuts at its ends against the end plates 4*a* which latter are provided with square openings 4*b* corresponding to the shape of the mandrel upon which the roll is adapted to be supported. The intermediate portions of the tube 3*a* are supported in spaced plates 5*a* one of which is shown in Fig. 5 in order to rigidify the structure. This roll may be in all other substantial respects similar to the roll shown in Figs. 1 to 3, already described.

I claim:

1. A stock roll comprising a hollow winding cylinder, a tube extending axially through the cylinder and adapted to receive a mandrel for rotating the cylinder, and a plurality of radially disposed plates within the cylinder maintaining the tube in concentrically spaced relation with reference to the cylinder, said cylinder having a longitudinal slot upon its circumference, a sleeve encircling the cylinder and provided with a roughened area for a substantial portion of its length, said sleeve being split throughout its length along a line parallel to its axis and provided with reversely-bent portions adjacent its line of split extending through the slot in the cylinder and engaging the interior of the cylinder, and said plates having clearance notches upon their peripheries adjacent the slot so as to permit the longitudinal introduction upon and removal of the sleeve from the cylinder.

2. A stock roll constructed and designed for the winding of relatively wide sheets of flexible material, comprising a cylinder provided with a recess extending longitudinally thereof, and a cylindrical sleeve encircling the cylinder and provided upon its circumference with a multitude of small projecting points defining a roughened area extending a substantial portion of the length of the sleeve, said sleeve being provided with a longitudinal slot, having inturned edges adjacent the slot together forming with an inwardly projecting key adapted to fit within the recess, said cylinder having at least one of its ends of a diameter not exceeding the interior diameter of the sleeve so as to permit the introduction upon and removal of the sleeve from the cylinder in a lengthwise manner.

3. A stock roll constructed and designed for the winding of relatively wide sheets of flexible material, comprising a hollow metal cylinder provided with a recess extending longitudinally thereof, and a cylindrical sleeve encircling the cylinder and provided upon its circumference with a multitude of small projecting points defining a roughened area extending a substantial portion of the length of the sleeve, said sleeve being provided upon its inner circumference with an inwardly projecting key adapted to fit within the recess, said cylinder having both of its ends of a diameter not exceeding the interior diameter of the sleeve so as to permit the introduction upon and removal of the sleeve from the cylinder in a lengthwise manner.

4. A stock roll constructed and designed for

the winding of relatively wide sheets of flexible material, comprising a hollow metal cylinder provided with a recess extending longitudinally thereof, and a cylindrical sleeve of sheet material encircling the cylinder and provided upon its circumference with a multitude of small projecting points defining a roughened area extending a substantially portion of the length of the sleeve, said sleeve being split lengthwise and provided upon its inner circumference with reversely bent portions adjacent the split adapted to hook over the walls of the recess, said cylinder having at least one of its ends of a diameter not exceeding the interior diameter of the sleeve so as to permit the introduction upon and removal of the sleeve from the cylinder in a lengthwise manner.

IRA H. J. ELLSWORTH.