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APPARATUS FOR WINDING SHEET MATERIAL

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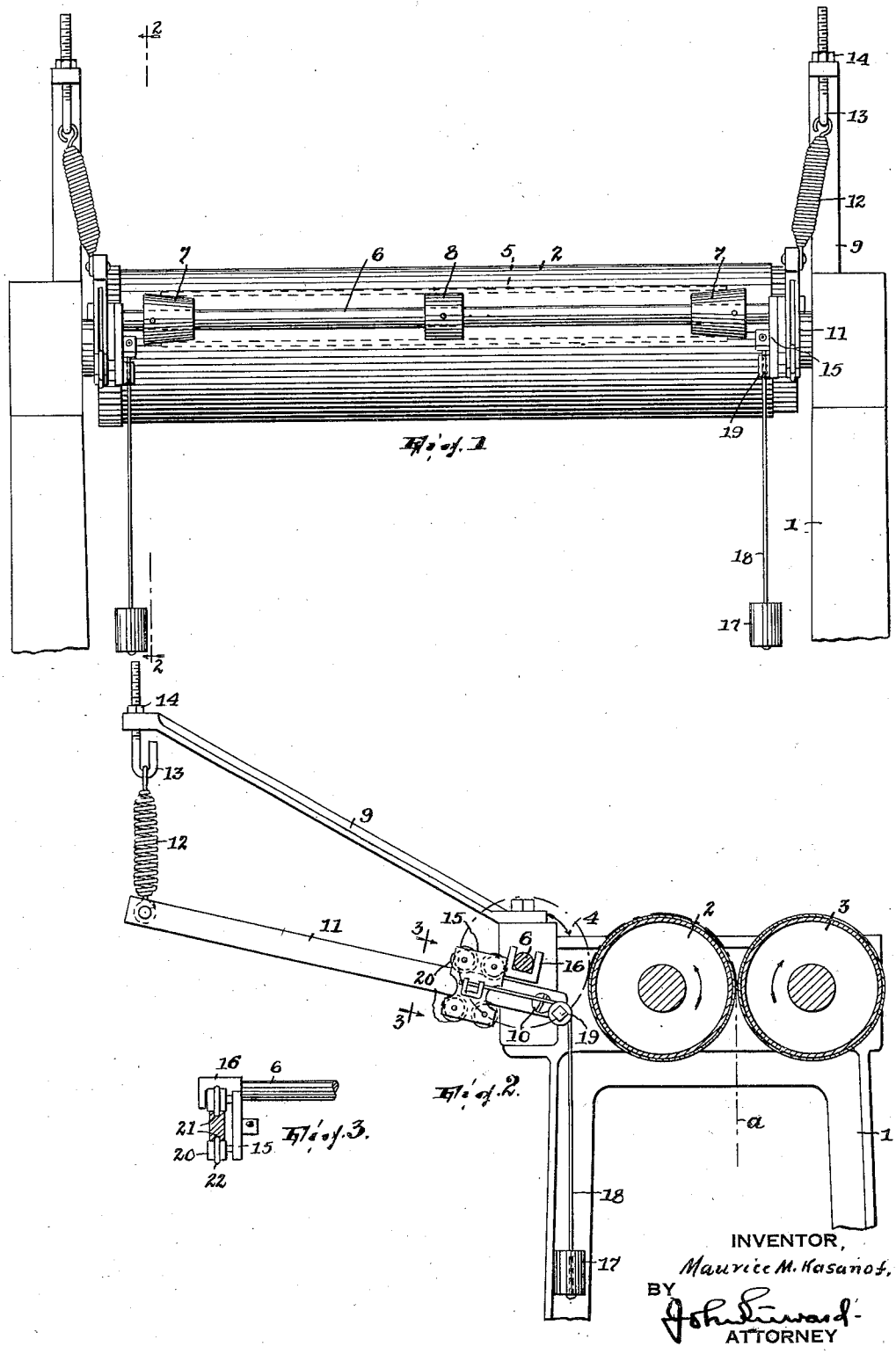


Fig. 1.

Fig. 2.

Fig. 3.

INVENTOR,
Maurice M. Kasanof,
BY
John Sinnard
ATTORNEY

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APPARATUS FOR WINDING SHEET MATERIAL

Maurice M. Kasanof, Bronx, N. Y.; David R. Kasanof and Abraham Kriegel, both of New York, N. Y., executors of said Maurice M. Kasanof, deceased

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2 Claims. (Cl. 242—65)

In forming a roll of knit goods, or in fact any fabric sheet having the thickness and elasticity of knit goods, it is found that the usual practice results in the fabric becoming stretched lengthwise and in a gradual narrowing of the fabric, so that the end thereof which is last wound on will be narrower than the other end; and if the sheet is many yards long this stretching and narrowing will be so appreciable as materially to detract from the value of the fabric. This stretching and narrowing is the result of the tension gradually increasing as the winding proceeds. That is to say, the usual practice is to place the roll of fabric upon and in tractive engagement with a rotating roller or cylinder for rotating it and maintain it constantly, from start to finish of the winding, in the same position upon and with respect to the roller, wherefore since the roll grows in size and hence in weight the pressure and hence the frictional or tractive grip between the roll and roller increases, with consequent increase of the tension on the fabric.

According to this invention the roll is permitted under control to descend relatively to the roller proportionately to its increase in weight and while being maintained in contact with the roller, whereby as the roll increases in weight the effective pressure which it exerts on the roller does not increase and hence the tension on the fabric also does not increase and stretching and the narrowing of the fabric are entirely avoided.

In the drawing,

Fig. 1 is a front elevation of the apparatus;

Fig. 2 is a section on line 2—2, Fig. 1; and

Fig. 3 a section on line 3—3, Fig. 2.

On suitable standards 1 is journaled on a horizontal axis the sheet-advancing or draft roller 2 with which may coact to effect the draft on or advance of the fabric sheet *a* (in this case upwardly) another roller 3 also journaled in said standard.

At 4 is shown the roll of the fabric sheet partially completed. Any core structure for this roll arranged to revolve around an axis substantially parallel with the axis of cylinder 2 may be provided, but I prefer to use for that purpose a paper tube 5 shown dotted in Fig. 1 and a shaft 6 which penetrates the tube and has reverse cones 7 to be entered tightly into the ends of the tube and a collar 8 to be contained in and support the midportion of the tube, whereby when the winding is completed and on removal of one cone the tube may be left as the core of the completed roll for shipment. The end portions of the shaft afford trunnions.

Arms 9 project from the standards 1 and form therewith parts of supporting means for the roll and below each arm, pivoted to the standards at 10, are rails or guide members 11, which form a guideway and are supported by springs 12 each of which is here shown attached directly to one of the members 9 and 11 and to the other through the medium of a hook 13 which penetrates said member and is threaded and has an adjusting nut 14 bearing against the same. As shown the hook 13 is attached to member 9.

On the rails are arranged to slide carriages 15 having bearings 16 for the trunnions of the mentioned core and normally urged toward the pivoted ends of the rails by weights 17 which are suspended from the carriages by flexible connections, as cables 18 extending over guides, as pulleys, 19 on the frame. These guides are so arranged as to direct the pull of the connections on the carriage and hence on the roll toward the roller. Each carriage preferably has anti-friction bearings 20 engaged with the top and bottom sides of the corresponding rail, and it is preferable to provide for guiding the carriage on the rails with the least possible friction, wherefore I prefer to groove the top and bottom sides of the rails, as at 21, and provide the rollers forming the bearings 20 with peripheral flanges 22 to enter these grooves, as shown in Fig. 3.

It will be understood that the spring means 12 opposes only such yielding resistance to the descent of the guideway formed by members 11 as will permit the latter to descend as the roll 4 increases in size and hence in weight. In other words, the spring means yields proportionately to the increase in weight of the roll.

When the winding is going on (rollers 2—3 rotating in the directions of the arrows applied to them in Fig. 2) the roll of fabric will be rotated in the direction of the arrow applied thereto due to the friction or traction incident to the pressure of the roll against the left-hand roller 2, in turn incident to the pull of the weights 17 on the carriage 15. As the roll increases in size and hence in weight the spring means 12 yields proportionately and as a consequence of the descent of the roll with the guideway 11 the pressure of the roll on said roller and hence the traction decreases and therefore the tension on the fabric is kept from increasing. In actual practice of my invention I am able, if proper weighting is applied at 17, to maintain a substantially constant tension on the fabric from start to finish of the winding.

It should not be understood that the guideway

11 must necessarily be inclined upwardly from the standards 1 at the start of the operation, as in Fig. 2, for at that time said guideway may be and in fact usually is in practice in approximately horizontal or even inclined somewhat downward from said standards. Nevertheless, since I am the first, so far as I am aware, to provide an upwardly inclined guideway supported by spring means and adapted to support the growing roll, I claim this arrangement substantially as shown in Fig. 2 and regardless of whether or not the means 17—18—19 is present, for it is obvious that even in that case the further the guideway descends under the weight of the growing roll the less will be the pressure of the roll against the roller and hence the tension will not be increased.

It is preferred, as indicated, that the guideway should comprise two independent guiding members 11 and separate means, as 12, opposing their swinging downward, as that insures a more compact and otherwise perfect formation of the roll being developed; but I do not wish to be limited to this construction.

The carriage means, afforded by the carriages 15, permits the roll to revolve with greater freedom than if it were supported directly by the guideway and affords convenient means to which to attach the cables 18.

Having thus fully described my invention what I claim is:

1. A knitted fabric winding machine comprising a supporting structure, means to feed the fabric upwardly comprising a pair of horizontal rollers coacting to grip the fabric between them and one of which is the driver and one of which is a guide roller over which the fabric extends in hugging relation thereto, a guideway projecting from the guide roller and fulcrumed in said structure to move downwardly and adapted to support the freely rotative roll of the fabric being wound in contact with the periphery of the guide roller and with its axis substantially horizontal, yielding means resisting descent of the guideway under the weight of the growing roll, and yielding means to maintain such roll bearing against the guide roller.

2. A knitted fabric winding machine comprising a supporting structure, means to feed the fabric upwardly comprising a pair of horizontal rollers coacting to grip the fabric between them and one of which is the driver and one of which is a guide roller over which the fabric extends in hugging relation thereto, a guideway projecting from the guide roller and fulcrumed in said structure to move downwardly and adapted to support the freely rotative roll of the fabric being wound in contact with the periphery of the guide roller and with its axis substantially horizontal, yielding means resisting descent of the guideway under the weight of the growing roll, and yielding means to maintain such roll bearing against the guide roller, said roll being supported by the guideway in all positions of the latter lateral of the guide roller.

MAURICE M. KASANOF.