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R. COTTAM ET AL

ROLLER FOR DRAWING MECHANISM FOR FIBROUS MATERIAL

Original Filed Jan. 26, 1923

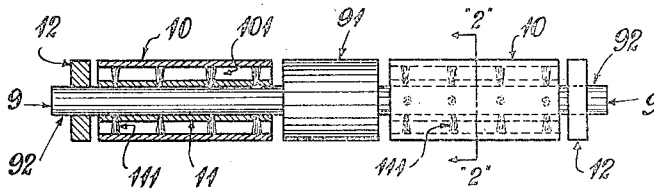


Fig. 1.

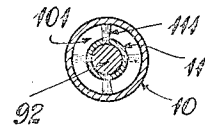


Fig. 2.

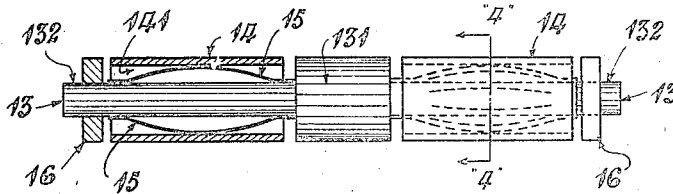


Fig. 3.

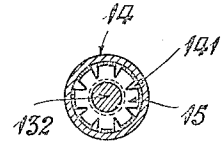


Fig. 4.

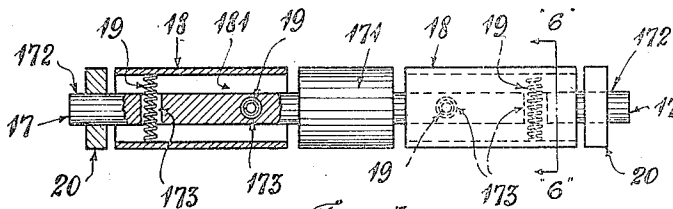


Fig. 5.



Fig. 6.

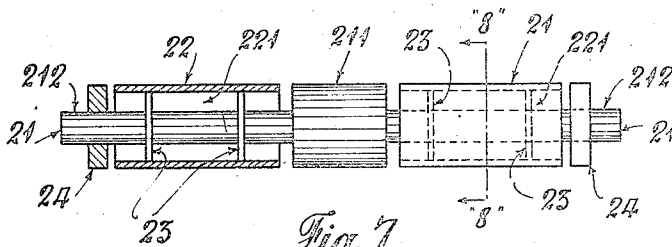


Fig. 7.

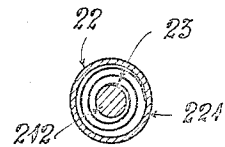


Fig. 8.

By their Attorneys:-

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UNITED STATES PATENT OFFICE.

ROBERT COTTAM, OF OLDHAM, THOMAS SEFTON, OF SHAW, AND JAMES EDWARD LEES, OF OLDHAM, ENGLAND.

ROLLER FOR DRAWING MECHANISM FOR FIBROUS MATERIAL.

Original application filed January 26, 1923, Serial No. 615,177. Divided and this application filed July 5, 1923. Serial No. 649,747.

To all whom it may concern:

Be it known that we, ROBERT COTTAM, THOMAS SEFTON, and JAMES EDWARD LEES, subjects of the King of the United Kingdom of Great Britain and Ireland, and residents of 55 Worcester Street, Oldham, in the county of Lancaster, England, 10 Oak Street, Shaw, in the county of Lancaster, England, and 41 Queens Road, Oldham, in the county of Lancaster, England, respectively, have invented new and useful Improvements in Rollers for Drawing Mechanism for Fibrous Material, of which the following is a specification.

This case is a division of our application filed January 26, 1923, Serial No. 615,177.

This invention consists in improvements in the rollers ordinarily called "self weighted rollers" which are made to bear with only their own weight on fibrous material in the form of strands, slivers or rovings in drawing or drafting mechanisms of any kind in order to press such fibrous material against rollers made to revolve or against other surfaces made to revolve or to travel and particularly relates to self weighted rollers for drawing or drafting mechanisms used to effect high drafting or great extensions of fibrous material.

The principal object of this invention is to obviate the defects experienced in the use of self weighted rollers in the methods hitherto customary in drawing or drafting mechanisms, especially in cases in which the self weighted rollers are very light, through such rollers failing to be revolved with approximate regularity by friction against the fibrous material on which they are made to bear or the rollers or surfaces with which they co-operate.

With this principal object the invention consists in "self weighted rollers" formed of sleeves which are mounted freely around and eccentrically movable relatively to axles made to revolve in use for holding them in position and have between them and the axles resilient frictional devices for ensuring the turning of the sleeves with the axles without or substantially without the axles imparting or transmitting pressure to the sleeves.

The accompanying drawing shows rollers forming illustrative embodiments of this invention. Figs. 1, 3, 5 and 7 are side elevations partly in longitudinal section and Figs. 2, 4, 6 and 8 are transverse sections the lines numbered in correspondence with figures indicating the several planes on which sections are taken. The same numerals of reference indicate corresponding parts.

In the roller shown in Figs. 1 and 2, 9 is the axle formed with a central boss 91 and two cylindrical arbors or rods 92 extending from that boss 91. The axle 9 is provided with two sleeves 10 loose around the arbors 92 and free to move for a convenient distance eccentrically in relation to them.

Round the arbors 92 are fixed sleeves 11 provided with tufts 111 of bristles to bear lightly against the interior surfaces of the sleeves 10. The boss 91 is made of a diameter such that it will hold up the axle 9 by bearing upon the fluted roller or other surface with which the roller shown is to cooperate while the diameters of the arbors 92 and the external diameters of the sleeves 10 and the diameters of the longitudinal holes 101 through them are made such that the sleeves 10 can move so far eccentrically in relation to the arbors 92 as to bear by only or substantially only their own weight on fibrous material or the fluted roller or other co-operating surface on which fibrous material is to be pressed while the bristles of the tufts 111 bear lightly against the interior surfaces of the sleeves 10. The arbors 92 are prevented by the boss 91 from applying pressure or substantial pressure to the sleeves 10. The boss 91 bears on the fluted roller or other co-operating surfaces on which fibrous material is to be pressed and promotes or ensures the turning of the axle 9 and the tufts 111 of bristles touching the interiors of the sleeves 10 frictionally cause the sleeves 10 to turn with the axle 9 while bearing by only or substantially only their own weight on fibrous material or against the co-operating roller or surface and without or substantially without the axle 9 imparting or transmitting pressure to them.

Two collars 12 equal in diameter to the

boss 91 so as like it to bear on the fluted roller or other co-operating surface and to transmit movement to the axle 9 are pushed tightly or otherwise secured on the arbors 5 92. The arbors 92 project through the collars 12 so that the roller can be revolved in guides similarly to ordinary top rollers of drawing or drafting mechanisms.

In Figs. 3 and 4, an axle 13 generally 10 similar to that shown in Figs. 1 and 2, with a central boss 131 from which extend cylindrical arbors 132 is provided with two sleeves 14 which are applied around the arbors 132 and made movable eccentrically 15 in relation to them.

The longitudinal holes 141 of the sleeves 14 have barrel shaped or tubular springs 15 applied in them around the arbors 132 to bear lightly against the interior surfaces of the sleeves 14 and preferably made to grip 20 the arbors 132. The springs 15 are made light and easily yielding so that while bearing against the sleeves 14 and against the arbors 132, so as to ensure the turning of the sleeves 14 with the axle 13 they will not 25 make the sleeves 14 bear with more or substantially more than just their own weight on fibrous material beneath them. More than one spring may be used in each sleeve 30 14 if desirable. Two collars 16 equal in diameter to the boss 131 so as like it to bear on the fluted roller or other co-operating surfaces and to transmit movement to the axle 13 are pushed tightly or otherwise secured 35 on the arbors 132.

In Figs. 5 and 6, an axle 17 generally similar to those shown in Figs. 1 and 2 and Figs. 3 and 4 with a central boss 171 from 40 which extend cylindrical arbors 172 is provided with two sleeves 18 which are applied around the arbors 172 and made movable eccentrically in relation to them by being formed with longitudinal holes 181 larger 45 in diameter than the arbors 172. The arbors 172 are furnished with transverse holes 173 in which are loosely fitted light and easily yielding springs 19 in compression to bear lightly with their ends against the interior surfaces of the sleeves 18 and to afford 50 frictional connection between the sleeves 18 and the arbors 172 to ensure the turning of the sleeves 18 with the axle 17. Although the springs 19 are free to move lengthwise in the holes 173 and so are little liable to 55 bind in the holes 173 they are preferably made light and easily yielding so that even should they bind in the holes 173 they will not make the sleeves 18 bear with substantially more than just their own weight on 60 fibrous material beneath them. There may be one spring 19 or more in each arbor 172, two being shown. Preferably in the use with a sleeve 18 of a plurality of springs 19 in holes 173 in an arbor 172 the holes 173 for

the springs 19 are formed in position to 65 present the springs 19 in such relative positions that the sleeve 18 may be moved with approximately equal ease in all directions eccentrically in relation to the axle 17. In each arbor 172 shown, the transverse holes 70 173 are formed with their center lines in planes at right angles so that when one is horizontal the other is vertical. Two collars 20 of the same diameter as the boss 171 so as like it to bear on the fluted roller or other 75 co-operating surface and to transmit movement to the axle 17 are pushed tightly or otherwise secured on the arbors 172.

In Figs. 7 and 8, an axle 21 generally 80 similar to those shown in Figs. 1 and 2, Figs. 3 and 4 and Figs. 5 and 6, with a central boss 211 from which extend cylindrical arbors 212 is provided with two sleeves 22 which are applied around the arbors 212 85 and made movable eccentrically in relation to them by being formed with holes 221 of larger diameter than the arbors 212. Between the sleeves 22 and the arbors 212 carrying them are applied flat coiled 90 springs 23 adapted to bear lightly against the interior surfaces of the sleeves 22. There may be one spring 23 or more used with each sleeve 22, two being shown, and preferably the springs 23 are made to grip the 95 arbors 212 to which they are applied so as to be held to them while bearing sufficiently against the interiors of the sleeves 22 around them to afford the friction requisite to ensure that the sleeves 22 shall turn with the 100 axle 21. The springs 23 are made light and easily yielding so as to afford the requisite frictional connection between the sleeves 22 and the arbors 212 without causing the 105 sleeves 22 to bear with substantially more than just their own weight on fibrous material beneath them. Two collars 24 of the same diameter as the boss 211 so as like it to bear on the fluted roller or other co-operating 110 surface and to transmit movement to the axle 17 are pushed tightly or otherwise secured on the arbors 212. Springs may be applied in other ways to afford resilient frictional connection between the sleeves and 115 axles while transmitting only very slight pressure to the sleeves. For example springs as shown in Figs. 7 and 8 to bear lightly 120 against the sleeves may be made to bear lightly against the axle but sufficiently to ensure turning of the sleeves with the axle, or springs may be held as by their expansion 125 to the sleeves and made to bear against the axle lightly but sufficiently to ensure turning of the sleeves with the axle. Also a spring applied as in Figs. 7 and 8 may be mounted in a groove formed circumferentially around a boss formed on the arbor with which it is used. In different constructions the axles and roller sleeves may be

of different materials and be formed and disposed in other ways without departure from the spirit of this invention as embodied in the claims following. Thus the roller

5 sleeves may be of any formation and material appropriate to the ways, mechanisms or machines in which they are to be used, as for example they may be formed of metal, wood, vulcanite or other material

10 suitable, and smooth, fluted or of other form or may be formed of cores of metal, wood, or other material with coverings of leather or other material appropriate or one sleeve or more may be provided around one axle.

15 Similarly the axles may be formed or furnished in any suitable way with bosses or driving parts for revolving the axles through bearing against or being made to engage with and so to be revolved by the

20 rollers or surfaces made to travel against which the sleeves are to press fibrous material, or by parts provided on such rollers or surfaces. The bosses or driving parts provided on the axles for revolving them

25 may be smooth or plain or fluted or roughened or covered with leather or adapted in any other way for bearing against or engaging with and receiving motion from fluted rollers or other surfaces against which

30 fibrous material is to be pressed by the sleeves of the rollers.

The weight of the axles and bosses or driving parts may be made to serve alone for causing the bosses or driving parts to bear against or engage with the rollers or

35 surfaces made to travel such an axle being called a self weighted axle, or the axles may be weighted or made subject to spring pressure in any way convenient as, for example, by weights or springs applied to

40 bear on the axles or in circumferential grooves therein in the parts between sleeves so that their revolution may be promoted while they will have no or approximately

45 no part in pressing the sleeves against the fibrous material and the fibrous material against the roller surfaces against which it is to be pressed. The tufts 111 of bristles and the springs 14, 19 and 23 besides affording frictional connections for turning

50 the sleeves with the axles on which they are respectively mounted fulfil also the function of resisting movement of the sleeves from the co-operating rollers or surfaces with

55 which they are used and counteracting the tendency of the inertia of the sleeves to delay or hinder the return of the sleeves to proper bearing on the fibrous material against the co-operating rollers or surfaces

60 and to interfere with the equable bearing of the sleeves on such fibrous material. Rollers comprising eccentrically movable sleeves mounted around axles and used along with resilient frictional devices for ensuring the

turning of the sleeves with the axles accord- 65
ing to this invention may be employed to co-operate with any kind or form of rollers or other surfaces in any forms of drawing or drafting mechanisms and may be used as the only means of pressing fibrous ma- 70
terial against the rollers or surface with which they co-operate or may be used in pressing fibrous material against rollers or surfaces with which other co-operating pressing rollers or devices are used. 75

What we do claim as our invention and desire to secure by Letters Patent is:

1. In a self weighted roller for a drawing mechanism as hereinbefore indicated, a revoluble axle having means for bearing up- 80
on and being revolved by a moving part with which the roller is to co-operate and so supporting and bringing about the revolution of the axle, a sleeve mounted around and eccentrically movable relatively to the 85
axle for bearing substantially by only its own weight on fibrous material and resilient frictional driving means between the axle and the sleeve for causing the sleeve to turn with the axle while leav- 90
ing said sleeve freely movable relatively to the axle.

2. In a self weighted roller for a drawing mechanism as hereinbefore indicated, a revoluble axle having means for bearing up- 95
on and being revolved by a moving part with which the roller is to co-operate and so supporting and bringing about the revolution of the axle, sleeves mounted around and eccentrically movable relatively to the 100
axle for bearing substantially by only their own weight on fibrous material and resilient frictional driving means between the axle and the sleeves for causing the sleeves to turn with the axle while leav- 105
ing said sleeves freely movable relatively to the axle.

3. In a self weighted roller for a drawing mechanism as hereinbefore indicated a self weighted revoluble axle having means for 110
bearing upon and being revolved by a moving part with which the roller is to co-operate and so supporting and bringing about the revolution of the axle, a sleeve mounted around and eccentrically movable relatively to the 115
axle for bearing substantially by only its own weight on fibrous material and resilient frictional driving means between the axle and the sleeve for causing the sleeve to turn with the axle while leaving said sleeve 120
freely movable relatively to the axle.

4. In a self weighted roller for a drawing mechanism as hereinbefore indicated a self weighted revoluble axle having means for 125
bearing upon and being revolved by a moving part with which the roller is to co-operate and so supporting and bringing about the revolution of the axle, sleeves mounted around

and eccentrically movable relatively to the
axle for bearing substantially by only their
own weight on fibrous material and resilient
frictional driving means between the axle
5 and the sleeves for causing the sleeves to
turn with the axle while leaving said sleeves
freely movable relatively to the axle.

In testimony, that we claim the foregoing
as our invention, we have signed out names
this nineteenth day of June, 1923.

ROBERT COTTAM.
THOMAS SEFTON.
JAMES EDWARD LEES.