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2,228,809

MECHANISM FOR DRAWING TEXTILE ROVINGS PROVIDED WITH NEEDLE ROLLERS

Filed June 25, 1938

2 Sheets-Sheet 1

FIG. 1.

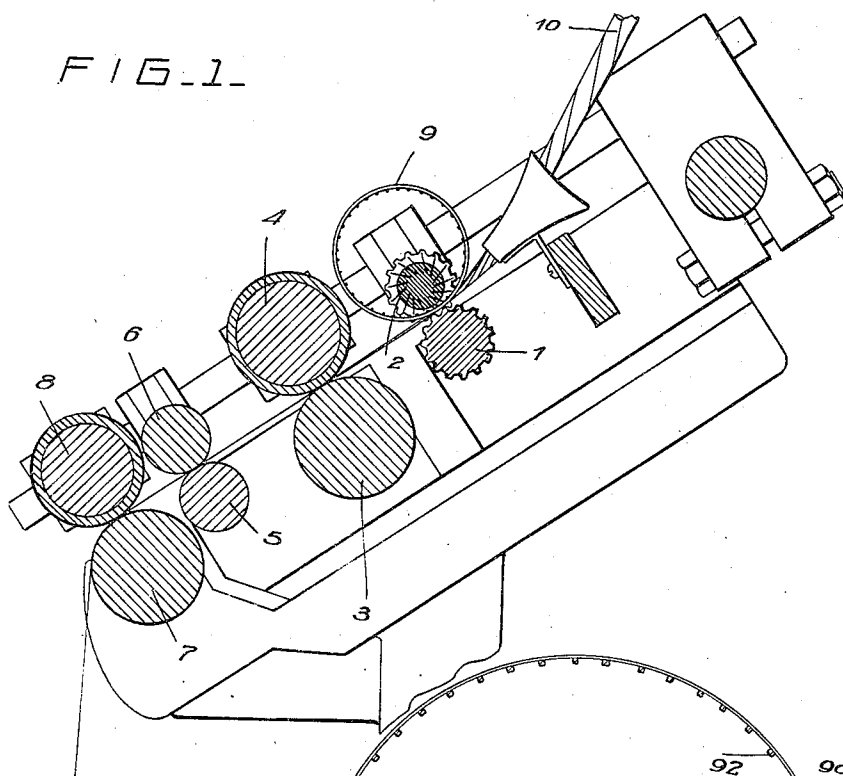
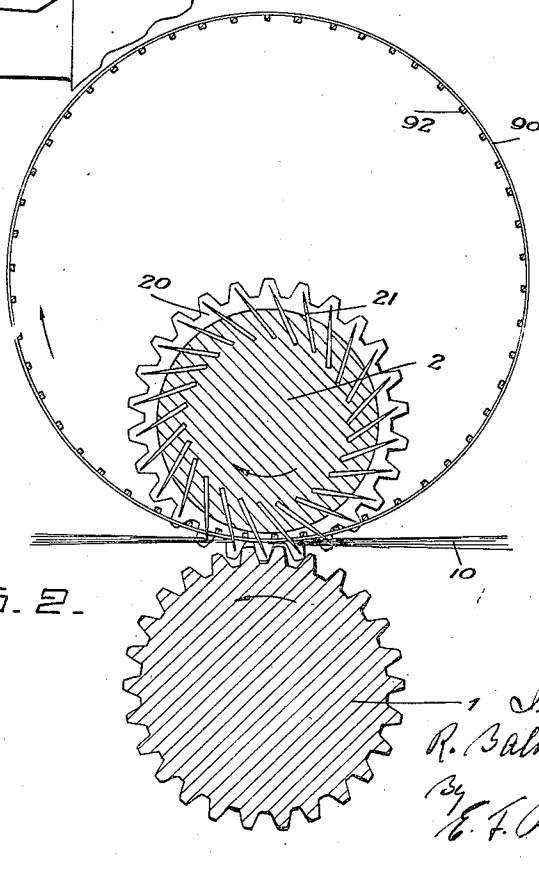


FIG. 2.



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FIG. 3.

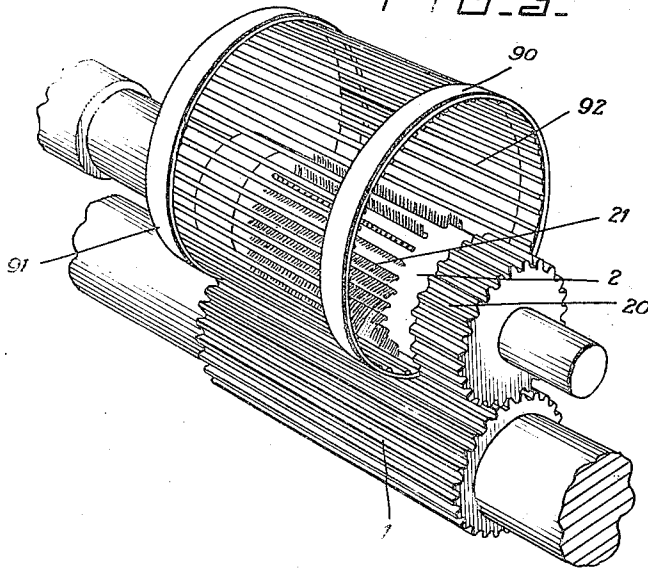
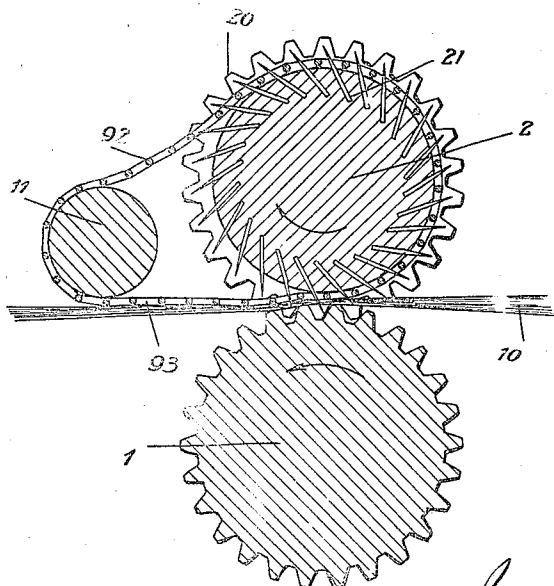


FIG. 4.



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UNITED STATES PATENT OFFICE

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MECHANISM FOR DRAWING TEXTILE ROVINGS PROVIDED WITH NEEDLE ROLLERS

Ramón Balmes Solanas, Pinedes de Llobregat,
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In Spain July 6, 1937

7 Claims. (Cl. 19—130)

The present invention relates to mechanisms for drawing textile rovings in which the roving is passed between a fluted roller and a roller, the surface of which is covered with spikes or with needles. In mechanisms of this kind, the lower roller is provided with grooves or is fluted, whereby it has a cross-section similar to that of a gear wheel, and the upper roller has its needles arranged in longitudinal lines which are spaced the same distance apart as the grooves of the lower roller, in such a manner that during the rotation the needles are successively introduced into the grooves of the lower roller. In order to produce this movement, at one of the ends of the upper roller, or at both its ends, are provided toothed pinions which mesh with the flutes of the lower roller. The roving passes between the two rollers and is gripped by the needles, in such a manner that this movement of the roving through the needles produces a combing effect which makes the fibres parallel and enables a better drawing to be obtained.

In such drawing mechanisms provided with needle rollers, the following drawback occurs, viz.: that after a prolonged operation of the mechanism, a few small fibres that become detached from the roving are introduced between the needles of the needle roller, thereby clogging said roller and impairing its efficient operation, sometimes even making same impossible.

The object of the present invention is an improvement made in said drawing mechanisms provided with needle rollers, by means of which the clogging of the needle roller is prevented, since the small fibres which might become lodged between the needles are continually removed and detached therefrom.

Said improvement consists in providing, about the needle roller, a cleaner which is formed by a part comprising a series of parallel iron rods or wires spaced apart from each other a distance equal to the pitch or spacing between the rows of needles of the roller. Said cleaner is arranged in such a manner that it surrounds the needle roller so that, on the line of tangency between the needle roller and the lower fluted roller, the rods or bars of the cleaner lodge themselves at the bottom of the hollows remaining between the rows of needles, the roving passing between the cleaner and the lower cylinder, but that when said line of tangency has been passed in the direction of the movement of the roving the rods or bars of the cleaner gradually move away from the bottom of the hollows between the rows of needles until they come completely

out of said hollows, carrying with them all the fibres that had become interposed between the needles.

Preferably, according to the invention, the cleaner is formed by a cylindrical part shaped like a squirrel cage and comprising two extreme rings between which a series of rods or bars are arranged along the generatrices of the cylinder and spaced apart a corresponding distance from each other. The cage, or hollow cylinder which forms said cleaner, has a greater diameter than that of the needle roller and when this latter rotates, the rows of needles which mesh with the rods or bars of the cleaner compel the latter to rotate and, owing to the difference between the diameters, the rods progressively come out of the spaces between the needles.

The cleaner may also be constructed in the shape of an endless chain, the links of which carry the rods or bars and which is guided in its movement in an appropriate manner so that at the point of tangency between the needle roller and the lower fluted roller, the rods remain lodged in the spaces between the rows of needles, but are then separated therefrom, thereby separating the fibres of the roving.

In the accompanying drawings, a drawing mechanism provided with a needle roller, to which the present invention has been applied, has been shown by way of example:

Fig. 1 is a transverse section of the mechanism as a whole;

Fig. 2 shows, on a much larger scale, a detail of the needle roller with the lower fluted roller and the cleaner interposed between the two;

Fig. 3 is a perspective view of these same elements;

Finally, Fig. 4 is a similar detail to that of Fig. 2, showing the modification in which the cleaner is constructed in the shape of a chain.

The drawing mechanism which is shown by way of example in Fig. 1 comprises: a pair of feed rollers or inlet rollers for the roving which pair is formed by a lower fluted roller 1 and an upper roller 2, the surface of which is covered with spikes or needles; a pair of intermediate rollers 3, 4; a pair of slip rollers 5, 6; finally, a pair of final drawing rollers or delivery rollers 7, 8.

The pair of feed rollers comprises a lower roller 1 (which, as seen in greater detail in Figs. 2 and 3, is fluted or provided with grooves in the same manner as if it were a gear wheel) and an upper roller 2 which is covered, on the useful part of its surface, with needles 21 arranged in rows along the generatrices of the

cylinder, said rows of needles being spaced apart from each other the same distance or pitch as the grooves of the roller 1. The upper rollers 2 are preferably constructed in pairs and at each end of a pair is mounted a toothed pinion 20, the teeth of which correspond to the rows of needles 21, and which meshes with the teeth or flutes of the lower roller 1. In this manner, an accurate movement of the upper roller 2 is obtained with certainty, in such a manner that the needles 21 are introduced into the grooves of the lower roller 1. The pinions 20 fix the spacing between the two rollers in such a manner that the needles 21 never touch the bottom of the said grooves, in order to prevent said needles from becoming deteriorated. The roving 10 passes between the rollers 1 and 2 and the fibres are retained by the needles; when they are stretched by the intermediate rollers 3, 4, they slip between the needles and a combing effect is thus produced which contributes to make the fibres parallel.

According to the present invention, in order to prevent the needles 21 from becoming clogged with the small fibres which are detached from the roving a cleaner, which is designated as a whole in Fig. 1 by the numeral 9, is provided about the needle roller 2.

In the embodiment of the invention shown in Figs. 1 to 3, the cleaner 9 is formed by two extreme rings 90, 91 and by a series of rods or blades 92 which are fixed to said rings in the direction of the generatrices of the cylinder and are spaced apart from each other a distance equal to the pitch between the teeth of the pinion 20 and between the rows of needles 21. The whole arrangement forms a kind of squirrel cage which has a larger diameter than that of the roller and which is placed about the latter, in such a manner that the rows of needles 21 pass through the spaces remaining between the rods 92 and penetrate into the grooves of the lower roller 1, as seen in detail in Figs. 2 and 3.

The cleaner 9 therefore fulfils the function of a lantern gear meshing at its internal part, and remains tangential with the roller 2 over the portion which corresponds to the line of tangency with the roller 1, but moves away therefrom over the remainder of the circumference. When the rollers 1, 2 start rotating in the direction indicated by the arrows in Fig. 2, the rods 92 of the cleaner which, at the point of tangency, are lodged at the bottom of the hollows formed between the rows of needles, gradually come out of said hollows, until they are completely out of reach of the needles, and in this movement they separate all the fibres of the roving 10 from the needles; the clogging of the roller 2 is thus efficaciously prevented and the efficient operation of the mechanism ensured.

In the modified embodiment shown in Fig. 4, the cleaner is formed by a chain 93, the width of which corresponds to the length of the rows of needles 21 of the roller 2 and on the links of which are fixed the rods or bars 92, or said links are formed by said rods themselves which are jointed at their end in an appropriate manner.

Said chain 93 is applied about the needle roller 2 in such a manner that said rods 92 are introduced into the hollows remaining between the rows of needles, and said chain is guided in an appropriate manner by a roller 11 which is arranged in such a manner that it compels the chain to move away from the roller 2 when the line of tangency with the lower roller 1 has been

passed, whereby the rods 92 compel all the fibres of the roving to come out of the rows of needles. The operation of this cleaner chain is therefore similar to that of the cleaner of Figs. 2 and 3 which was described above.

It is obvious that the arrangement of the other elements of the drawing mechanism may be varied at will and may differ from the arrangement shown in Fig. 1.

What I claim is:

1. In a roving drawing mechanism of the type having a roll carrying longitudinal rows of needles on its surface and a fluted roll into the grooves of which said needles are adapted to engage, cleaning means comprising two end members and a series of bars extending between said members in parallel relation, said bars being spaced apart from each other the same distance as two adjacent rows of needles, said cleaning means being interposed between said two rolls and said bars being adapted to co-operate with said needles in such a manner that on the line of tangency, the roving passing between the cleaner and the fluted roll pushes said bars towards the bottom of the grooves between said rows of needles, but beyond the line of tangency, the bars push the fibres of the roving outwardly, thereby removing all the fibres which may have remained between said rows of needles.

2. In a mechanism for drawing textile rovings of the type having a roll carrying longitudinal rows of needles on its surface and a fluted roll into the grooves of which said needles are adapted to engage, cleaning means comprising a chain, the width of which corresponds to the length of a row of needles, a bar secured to each of the links of said chain, said bars extending in parallel relation and being spaced apart from each other the same distance as two adjacent rows of needles, and means for guiding said chain in such a manner that said bars engage between the rows of needles, but beyond the line of tangency of the needle roll and said fluted roll, said bars become disengaged from between the rows of needles, thereby removing all the roving fibres which may have remained between said rows of needles.

3. In a mechanism for drawing textile rovings of the type including a roll carrying longitudinal rows of needles on its surface and a fluted roll into the grooves of which said needles are adapted to engage, cleaning means comprising a chain, the width of which corresponds to the length of a row of needles, the links of said chain being formed by bars which are jointed at their end and extend in parallel relation, said bars being spaced apart from each other the same distance as two adjacent rows of needles, and means for guiding said chain in such a manner that said bars engage between the rows of needles, but beyond the line of tangency of the needle roll and said fluted roll, said bars become disengaged from between the rows of needles, thereby removing all the roving fibres which may have remained between said rows of needles.

4. A cleaning mechanism for the needle cylinder of a drawing mechanism for textile rovings comprising a needle cylinder having rows of needles thereon, a fluted cylinder with which said needle cylinder cooperates, means encircling said needle cylinder, spaced bars upon said means so positioned as to mesh with said rows of needles, said means having a greater peripheral extent than the periphery of said needle cylinder so that at the point where said needle cylinder

cooperates with said fluted cylinder said bars are meshed with said rows of needles and then after passing said point of contact said bars move away from said rows of needles so as to separate any roving fibers from said needle cylinder.

5 5. A cleaning arrangement for the needle cylinder of a drawing mechanism for textile rovings, comprising a needle cylinder having rows of needles thereon, a fluted cylinder cooperating with said needle cylinder, a squirrel cage encircling said needle cylinder having a greater diameter than said needle cylinder and spaced bars upon said squirrel cage so spaced as to mesh with the rows of needles upon said needle cylinder so that upon rotation of said needle cylinder and fluted cylinder the bars of said squirrel cage will be meshed with said rows of needles at the point where said needle cylinder cooperates with said fluted cylinder and then after passing said point said bars gradually separate from said needles so as to remove any fibers retained upon said needle cylinder.

10 6. In a mechanism for drawing textile rovings of the type having a roll carrying longitudinal rows of needles on its surface and a fluted roll into the grooves of which said needles are adapted to engage, cleaning means comprising two extreme annuli of a substantially greater diameter than the needle roll and a series of bars extending between said annuli in parallel relation, said bars being secured to said annuli and spaced apart from each other the same distance

as two adjacent rows of needles, so that upon rotation of said needle roll and fluted roll said bars will be meshed with said rows of needles at the point where said needle roll cooperates with said fluted roll and then after passing said point, said bars gradually separate from said needles so as to remove any fibers retained upon said needle roll.

7. In a mechanism for drawing textile rovings of the type having a roll carrying longitudinal rows of needles on its surface and a fluted roll into the grooves of which said needles are adapted to engage, cleaning means comprising two extreme annuli of a substantially greater diameter than the needle roll and a series of bars extending between said annuli in parallel relation, said bars being secured to said annuli and spaced apart from each other the same distance as two adjacent rows of needles, said cleaning means being interposed between said two rolls and said bars being adapted to cooperate with said needles in such a manner that on the line of tangency, the roving passing between the cleaner and the fluted roll pushes said bars towards the bottom of the grooves between said rows of needles, but beyond the line of tangency, the bars push the fibres of the roving outwardly, thereby removing all the fibres which may have remained between said rows of needles.

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