

1,218,658.

2 SHEETS—SHEET 1.



1,218,658.

Fig. 5.

Fig. 6.

Fig. 7.

Fred. S. Greenleaf.
Joseph M. Ward.

Inventor.
Lewis T. Howgdon,
Box 124, Newbury, N. H.
U.S.A.

UNITED STATES PATENT OFFICE.

LEWIS T. HOUGHTON, OF WORCESTER, MASSACHUSETTS.

TOP-ROLL-SADDLE MECHANISM.

1,218,658.

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To all whom it may concern:

Be it known that I, LEWIS T. HOUGHTON, a citizen of the United States, residing at Worcester, county of Worcester, and State of Massachusetts, have invented an Improvement in Top-Roll-Saddle Mechanisms, of which the following description, in connection with the accompanying drawings, is a specification, like characters on the drawings representing like parts.

This invention relates to top roll mechanism. The top roll saddle mechanism most commonly used is one in which the saddle is composed of two members, of which the under or rear one rests on the rear and center top rolls, while the upper or front one rests at one end on the front top roll and at its rear end on the under member, and in which the stirrup sustaining the weighted lever is hung from the front member of the saddle. The front top rolls are arranged to rotate faster than the middle rolls, and these latter rotate faster than the rear rolls so that the roving will be drawn out or stretched between the different rolls. In order to obtain a yarn or thread which is uniform throughout, it is essential that each pair of rolls should prevent the roving from being delivered therefrom faster than it would be fed by the rotation thereof, in other words, the weight should be so distributed on the various rolls that the roving will not be drawn between the rolls of any pair by the pair ahead.

In the above-referred to type of top roll saddle mechanism as heretofore constructed, the greater part of the weight on the stirrup is borne by the front top roll, this being so because the stirrup, which passes down between the front and center top rolls, is so supported on the upper saddle member that the weight is applied to the latter in line with the stirrup. As a consequence, when the stirrup is sufficiently weighted so as to apply the desired weight to the center and rear top rolls the portion of the weight which is taken by the front top roll is much greater than is necessary for the proper operation of the machine. This useless weight on the front top roll not only increases the power necessary to drive the spinning machine, but it also subjects the front top rolls to needless wear. As the top rolls become worn or concaved on that portion traversed by the yarn, it becomes necessary to increase the weight on

the saddle in order to secure the proper drawing action on the roving between the successive rolls, and this increase of weight is sometimes secured by increasing the weight on the weighted lever and sometimes by changing the relative lengths of the lever arms of the weighted lever. The addition of extra weight on the weighted lever is objectionable for many reasons, and when the relative lengths of the lever arms are changed, thereby to increase the effective weight on the top rolls, the angular position of the stirrup is apt to be changed. Where the stirrup is hung directly on the upper member of the top roll saddle, it is important that said stirrup should stand at right angles to the plane of the top rolls, for if the stirrup is thrown out of this right-angular position, the pull of the stirrup on the saddle will be in a direction tending to displace the members thereof from their correct position, and hence the attempt to increase the weight on the top rolls by changing the relative lengths of the lever arms of the weighted lever in such a way that the stirrup is shifted out of its correct perpendicular position is not a satisfactory method of accomplishing this purpose.

It is one of the objects of my invention to provide a novel top roll mechanism which is so constructed that the weight will be distributed on the three top rolls in such a way that each will bear only its proper proportion, and the front top roll will not be subjected to any unnecessary weight, and in which the effective pull of the weight may be increased or diminished without changing the direction in which the weight is applied to the saddle; another object of the invention is to provide a novel construction whereby the weight may be applied to the saddle at a distance from the stirrup; another object is to provide a mechanism whereby the pressure on the top roll saddle will always be applied in a direction perpendicular to its position, regardless of the position of the stirrup; and another object is to provide a novel construction whereby the weight may be readily taken off from the center top roll when desired, and still another object is to provide a novel construction of bearing for the top roll saddle, and novel means for keeping the bearing oiled. These and other objects of my invention will more fully hereinafter appear upon reference to the following descrip-

tion of some selected embodiments of my invention.

In the drawings, Figure 1 is a view showing in side elevation a top roll saddle embodying my invention;

Fig. 2 is a longitudinal section through the top roll saddle;

Fig. 3 is a view somewhat similar to Fig. 2 but showing the rear member of the saddle elevated from the center roll;

Fig. 4 is a top plan view of the top roll saddle shown in Fig. 2;

Fig. 5 is a view similar to Fig. 1 showing a different embodiment of the invention;

Fig. 6 shows the bearing of the top roll saddle for the front top roll;

Fig. 7 shows the bearing for the center and rear top rolls;

Fig. 8 shows the stirrup;

Fig. 9 is a section on the line $x-x$, Fig. 3.

The parts which are old and form no part of my invention are the roller beam 3 on which is sustained the stand 4 supporting the top rolls 5, 6 and 7 and the bottom rolls 8, the weighted lever 9 which is fulcrumed in the lever screw or fulcrum 10 that is carried by the roller beam and is suspended from the stirrup 11 that applies the pressure to the top roll saddle. These parts are those which are commonly found in top roll saddle mechanism and, with the exception of the stirrup and weighted lever, form no part of my invention.

The top roll saddle herein shown, and which embodies a construction that I prefer, comprises the under saddle member 14 which rests on the rear and center top rolls 6 and 7 and the upper saddle member 12 which rests on the under saddle member 14 and also bears on the front top roll 5. The upper saddle member is provided with the bearing member 13 which forms the bearing on the front top roll. These parts of the top roll saddle are preferably made of sheet metal pressed or stamped into shape by means of dies. The upper saddle member 12 is shown as having the side flanges 15 between which the bearing 13 and also the under saddle member 14 are received. The bearing member 13 is cup-shaped and may be readily stamped or pressed into shape from sheet metal, and it constitutes a lubricant-receiving chamber within which a suitable lubricant may be placed, said member having the oil hole 17 therein which is formed through the curved or rounded portion 16 that bears on the front top roll. The under saddle member 14 is also cup-shaped and has the rounded bearing surface 18 which rests on the rear top roll and which is provided with an oil hole 28 through which the roll may be lubricated. The upper edges of the sides of the under saddle

member 14 are shown as formed with two portions 20 situated at an angle to each other thereby to form fulcrum points 21 on which the upper saddle member rests and which provides for a rocking movement of the under member on the upper member whenever it is desired to relieve the weight from the center top roll. I have shown herein two different ways of rocking this under member to thus relieve the weight on the center top roll, and in Fig. 3 I have shown for this purpose a screw 23 extending through the upper saddle member 12 and bearing against the rear end of the under member 14. By turning this screw the relative position of the upper and under saddle members may be shifted thereby to lift the under member from the center top roll, as clearly seen in Fig. 3. In Fig. 2 I have shown another device for accomplishing this object which is in the form of a strut 24 having a portion 25 projecting through an aperture 26 formed in the upper saddle member 12 and provided with shoulders 27 that are adapted to engage the under side of said member either side of the apertures. By tipping the strut 24 into a vertical position the front end of the under saddle member 14 will be tipped up thereby taking all the weight off from the center top roll.

The bearing member 13 and the under member 14 constitute lubricant-receiving chambers, and they may be filled with wicking or some other suitable material for holding the lubricant. The under saddle member 14 is shown as having a partition 24 so as to divide it into two lubricant-receiving chambers. I may use a thick lubricant in paste form, although any suitable lubricant will answer.

I prefer to make the members 13 and 14 of brass, but any other suitable metal may be used without departing from the invention.

In most top roll saddle mechanism the stirrup 11 rests directly on the upper member of the saddle, and as a result the weight of the weighted lever is transmitted to the saddle in the direction which the stirrup assumes and at the point where the stirrup rests thereon. Since the stirrup passes between the front and middle top rolls it follows that the front roll will bear an undue proportion of the weight as I have above pointed out. One of the objects of my present invention is to provide a novel manner of supporting the weight and transmitting it to the top roll saddle so that the weight may be evenly distributed on the three rolls without applying any undue weight on any one of the rolls. I accomplish that object herein by providing a construction whereby the weight is transmitted to the saddle at a point out of line with the

stirrup, and in this way the point where the weight is transmitted may be so selected as to secure the proper distribution of the weight. In the embodiment herein illustrated, I employ for this purpose an intermediate member 31 to which the stirrup is secured and which rests on the upper member of the saddle and I also provide an arrangement for adjusting the point of contact between said member and the saddle so as to secure the proper distribution of the weight. In the embodiment shown in Fig. 1 the intermediate member 31 is provided with one or more arms 33 that are shaped to embrace a fixed rod or support 34 carried by the stand 4, and the weight is transmitted from the member 31 to the upper saddle member 12 through a bearing block 32 interposed between said members. This bearing block may be supported in any suitable way, and in the present embodiment of my invention it is sustained by the member 31. The stirrup 11 may be suspended from the member 31 in any suitable way, and as one convenient means I have shown said member as carrying a headed projection 35 which is adapted to extend through an aperture 93 formed in the stirrup. The said bearing block 32 is situated between the point of attachment of the stirrup with the member 31 and the point where said member connects to the frame 4, and, therefore, the weight on the stirrup will be transmitted to the saddle 12 through said bearing block 32 which is situated out of line with and at one side of the stirrup 11. The member 31 as herein shown has a bearing at one end against the fixed rod 34 and the weight on the stirrup 11 will, therefore, be applied to the saddle 12 through the bearing 32. By shifting the bearing block 32 nearer to or farther from the stirrup 11, the weight which is transmitted to the saddle will be varied, for the member 31 constitutes in effect a lever of the second class fulcrumed on the point 34, and the amount of the weight transmitted to the saddle 12 depends upon the relative lengths of the lever arms of said lever. The bearing block 32 may be shifted longitudinally of the member 31 in any suitable way. I have herein shown the projection 35 from which the stirrup is suspended as being a screw which has screw-threaded engagement with the bearing block 32 and is journaled in a bearing 36 sustained by the member 31. By turning this screw the bearing block 32 may be adjusted into any desired position thereby varying the effective action of the weighted lever on the saddle, as will be obvious. Moreover, the shifting of the bearing block 32 will cause the weight to be applied to the saddle at different points and will therefore change the distribution of the weight on the rolls.

It will be noted that the intermediate member 31 which may be called a weight-transmitting member because of the fact that it receives the weight on the stirrup and transmits this weight to the saddle, has a general U-shape in cross section, and not only overlies but also embraces the top roll saddle. It will further be noted that the bearing block 32 is situated within the weight-transmitting member and, therefore, takes up no additional room. The advantage of this construction when used with the type of top roll saddle herein illustrated is that the entire construction takes up only about the same space that the ordinary top roll saddle does, and a construction is, therefore, provided which can be substituted in the ordinary spinning frame for the top roll saddles in use. A majority of the spinning frames now in use use clearer boards with flannel resting on the top roll, and the construction herein shown is of such a nature that it can be applied to these spinning frames with the clearer boards without any difficulty, as the weight-transmitting member and top roll saddle take up no more room than the ordinary top roll saddle.

I have also made provision for adjusting the point of attachment between the stirrup and the weighted lever 9 so as to increase or decrease the pressure on the saddle, and in the present embodiment I have shown said weighted lever as provided with a slot 40 having a plurality of notches 41 formed in the upper side thereof with any one of which the stirrup 11 may be engaged. Said stirrup may be and preferably will be made with a hook shape at its lower end, as shown in Fig. 8 so that it may be readily applied to or disconnected from the lever 9.

If it is desired to increase the weight on the top rolls without changing the distribution of the weight, then the stirrup may be adjusted relative to the lever 9 so that the connection between the stirrup and lever will be nearer to the fulcrum 10. In doing this the stirrup will, of course, be thrown into a position which is inclined to the direction of the saddle, but this will not change in any way the direction in which the weight is applied to the saddle because the weight is applied indirectly through the bearing block 32 and the pressure of the bearing block on the saddle is always in a direction perpendicular thereto, regardless of the position of the stirrup 11.

With my improved top roll saddle mechanism it is possible to use a much lighter weight than is commonly used and yet to get the same pressure on the top rolls, and further, the weight on the top rolls may be increased or decreased by shifting the position of the stirrup relative to the weighted lever 9 without affecting the direction in which the weight is applied to the saddle.

Further, my invention permits me to readily shift the point where the pressure of the stirrup is applied to the saddle thereby to adjust the distribution of the weight on the top rolls.

In Fig. 5 I have shown an embodiment of the invention wherein the connection between the intermediate member 31 and the frame is situated between the rear and center rolls. In this embodiment said member 31 is provided with the arm 40 which hangs down between the center and rear top rolls and has engagement with a cross bar 41 extending parallel to the rear and center rolls. In other respects the invention shown in Fig. 5 is similar to that shown in Fig. 1.

From the above it will be seen that in my invention the point where the weight is applied to the saddle is out of line with the stirrup, and by means of this construction it is possible to secure the proper distribution of the weight on the top rolls as above specified. Moreover, it will be seen that the intermediate member 31 is independent from the saddle and that my invention comprehends a construction wherein the support for the stirrup is thus independent from the saddle.

It will be obvious that this manner of supporting the weight may be used in connection with any top roll saddle having upper and under saddle members, and although I have shown herein a particular form of top roll saddle which I regard as preferable to the forms heretofore used, yet so far as the method of applying the weight to the saddle is concerned, the invention is not limited to the particular saddle construction illustrated. I believe I am the first to provide a construction whereby the weight on the stirrup is transmitted to the saddle at a point out of line with the stirrup, and I desire to claim this broadly.

By the term "top roll saddle" as used in the appended claims I mean the entire saddle structure which rests on all of the top rolls, and in the embodiment of the invention herein shown this includes the upper member and the under member.

Having fully described my invention, what I claim as new and desire to secure by Letters Patent is:—

1. In top roll saddle mechanism, the combination with top rolls, of a top roll saddle resting thereon, a weight-transmitting member having a general U-shape in cross section and resting on and embracing the top roll saddle, whereby said member does not add materially to the height of the saddle, and a weighted stirrup sustained from said member.

2. In top roll saddle mechanism, the combination with three pairs of top rolls of a top roll saddle comprising an under member resting on the rear and center top rolls and an upper member resting on the

front top rolls and the under member, a weight-transmitting member separate from the saddle, said weight-transmitting member having a general U-shape in cross section and embracing and resting on the upper saddle member, and a weighted stirrup sustained from said weight-transmitting member.

3. In top roll saddle mechanism, the combination with three pairs of top rolls, of a top roll saddle comprising an under member resting on the center and rear top rolls and an upper member resting on the front top rolls and the under saddle member, a weight-transmitting member having a general U-shape in cross section embracing the top roll saddle, and a bearing block situated within said weight-transmitting member and bearing against the upper saddle member.

4. In top roll saddle mechanism, the combination with three pairs of top rolls, of a top roll saddle comprising an under member resting on the center and rear top rolls and an upper member resting on the front top rolls and the under saddle member, a weight-transmitting member overlying the top roll saddle and presenting a body portion having a general U-shape in cross section to permit it to embrace and set low on the upper saddle member, the rear end of said member being forked and pivotally connected to a fixed support, and a bearing member situated within the U-shaped body portion between the latter and the top roll saddle.

5. In top roll saddle mechanism, the combination with top rolls, of a top roll saddle resting thereon, a weight-transmitting member resting on the saddle, a stirrup hung from said member, a weighted lever hung from the stirrup, said lever having an opening therein, and a stirrup having a laterally-extending finger entering said slot.

6. In top roll saddle mechanism, the combination with top rolls, of a top roll saddle resting thereon, a pivotally-mounted weighted lever provided with an opening, and a stirrup suspended from the saddle and having a laterally-extending finger entering said opening and constituting the fulcruming connection between the lever and stirrup.

7. In top roll saddle mechanism, the combination with top rolls, of a top roll saddle resting thereon, a slotted pivotally-mounted weighted lever, and a stirrup suspended from the saddle and having a laterally-extending finger entering the slot of the lever and adjustable longitudinally thereof.

8. In a top roll saddle mechanism, the combination with an under saddle member resting on the rear and center top rolls and made cup-shaped to present an oil receiving chamber which extends over both rolls, of an upper saddle member resting on the front

top roll and on the under saddle member, said upper saddle member comprising a body portion and a cup-shaped bearing member secured to the underside thereof and resting
5 on the front top roll.

9. In a top roll saddle mechanism, the combination with a saddle member having side flanges, of two cup-shaped members confined between said flanges, one member being
10 adapted to rest on the front top roll and the other being adapted to rest on the center and rear top rolls, and means to move the latter member relative to the saddle member thereby to raise and lower the front end thereof.

15 10. In a top roll saddle mechanism, the combination with a saddle member having side flanges, of two cup-shaped bearing members situated between the side flanges each forming with itself an oil chamber, one
20 of said bearing members being adapted to rest on the rear and center top rolls and having a rocking engagement with the saddle member, and means to rock said bearing member relative to the saddle member.

25 11. In top roll saddle mechanism, the combination with an under saddle member resting on the rear and center top rolls and made cup-shaped to present an oil-receiving chamber which extends over both rolls, of
30 an upper saddle member resting on the front top roll and on the under saddle member, said upper saddle member comprising a body portion and a cup-shaped bearing

member secured to the underside of the body portion but resting on the front top rolls, 35 said body portion closing the open top of said cup-shaped bearing member.

12. In top roll saddle mechanism, the combination with an under saddle member resting on the rear and center top rolls and 40 made cup-shaped to present an oil-receiving chamber which extends over both rolls, of an upper saddle member resting on the front top roll and on the under saddle member, said upper saddle member comprising 45 a body portion having depending flanges at its sides, and a cup-shaped bearing member resting on the front top roll and held in position between said flanges.

13. In a top roll saddle mechanism, the 50 combination with a top roll saddle, of a weight-transmitting member, an adjusting screw carried thereby and extending parallel to the top roll saddle, a bearing block through which said adjusting screw extends 55 and which is held in adjusted position thereby, said bearing block engaging the top roll saddle, and a weighted stirrup hung from the weight-transmitting member.

In testimony whereof, I have signed my 60 name to this specification, in the presence of two subscribing witnesses.

LEWIS T. HOUGHTON.

Witnesses:

LOUIS C. SMITH,
FREDERICK S. GREENLEAF.