Mar. 13, 1923. 1,448,192

A. C. BUTLER

DRAWING MECHANISM

Filed Dec. 3, 1920

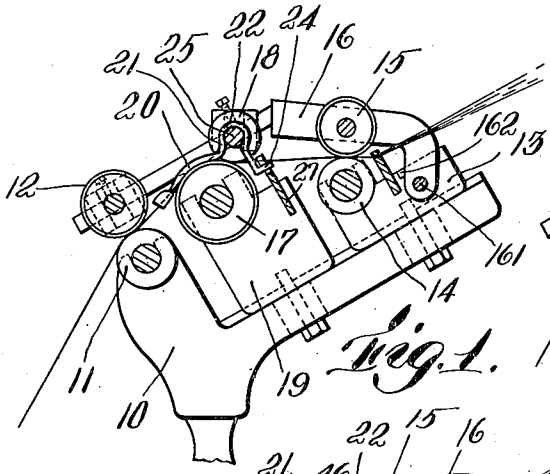


Fig. 1.

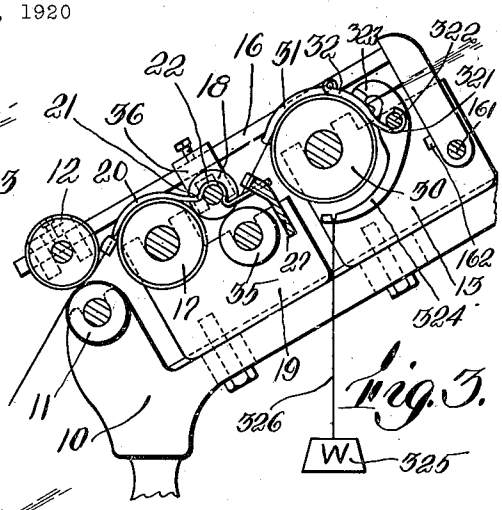


Fig. 3.

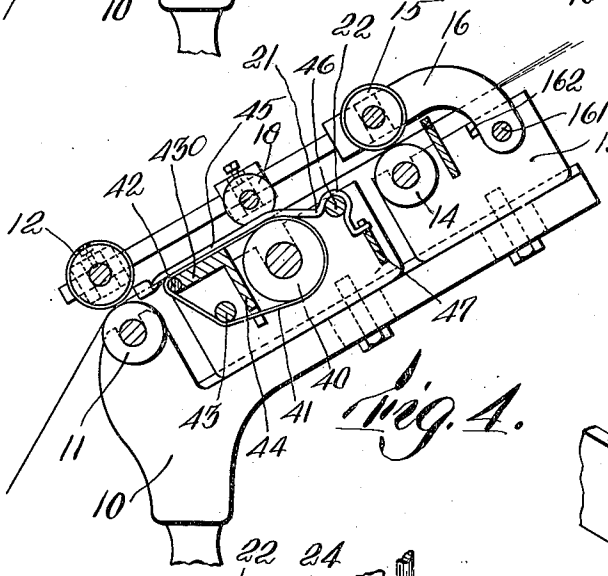


Fig. 4.

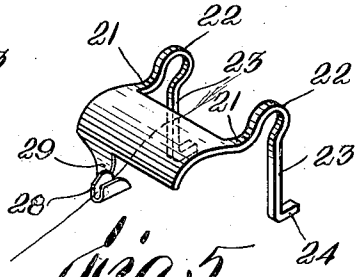


Fig. 5.

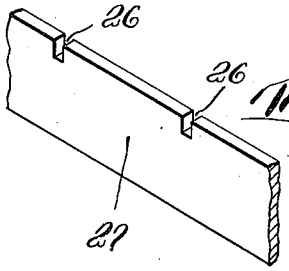


Fig. 6.

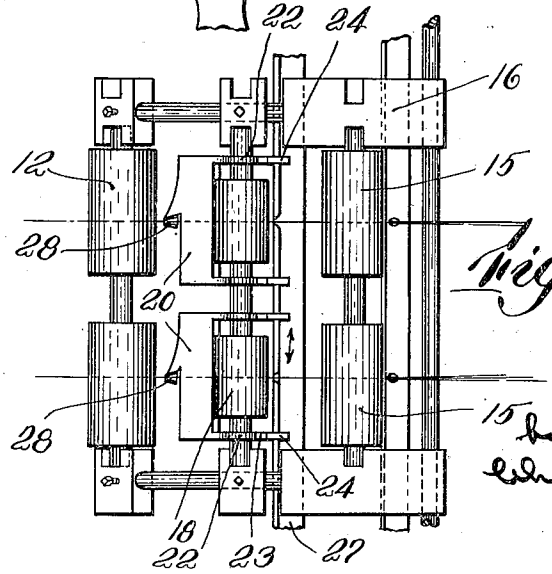


Fig. 2.

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UNITED STATES PATENT OFFICE.

ARTHUR CECIL BUTLER, OF BOSTON, MASSACHUSETTS.

DRAWING MECHANISM.

Application filed December 3, 1920. Serial No. 427,989.

To all whom it may concern:

Be it known that I, ARTHUR CECIL BUTLER, a subject of the King of Great Britain, residing at Boston, in the county of Suffolk and State of Massachusetts, have invented new and useful Improvements in Drawing Mechanism, of which the following is a specification.

This invention has relation to the drawing mechanism of drawing, twisting or spinning frames, and has for its object to provide certain improvements therein, by which the roving or sliver may be extended and attenuated to a greater extent than heretofore without the formation of abnormally thin or weak spots therein.

According to the present invention, I employ a plurality of pairs of drawing rolls or their equivalents which are operated at different speeds to draw out the roving. That is, I employ two or more—preferably three,—bottom rolls or moving elements which are positively driven, and complemental elements, e. g. top rolls or members to coact therewith. In order that the rolls may attenuate and elongate the roving without the formation of thin spots, the parts are so arranged that the roving is supported by a travelling surface for a portion of the distance travelled by the roving from the nip of one pair of rolls to the nip of the next pair. The yarn, in such event, is pressed yieldingly upon such travelling surface by loosely hinged or pivoted gravity members, each of which also may be provided with a condensing or condenser guide.

On the accompanying drawing,—

Figure 1 illustrates more or less conventionally in vertical section a portion of a mechanism embodying my invention.

Figure 2 represents a plan view of the same.

Figure 3 represents, in vertical section, a second embodiment of the invention.

Figure 4 represents, similarly in section, a third embodiment of the invention.

Figure 5 illustrates, in perspective, one of the gravity members.

Figure 6 illustrates a portion of a traverse bar.

Referring first to Figures 1 and 2, a roll stand is shown conventionally at 10, and it has the usual bearings for the front bottom roll 11, with which cooperates the usual top roll 12. On the roll stand are adjustably secured bearing blocks such as at 13 on which are journaled the bottom back roll 14. A back top roll 15 coacts with the roll 14, and it is journalled in cap bars, one of which is shown at 16. Between the two pairs of rolls are located the intermediate rolls 17, 18, the former being journaled in blocks such as indicated at 19, adjustably secured to the roll stand. The three bottom rolls 14, 17 and 11 are all driven positively by the usual mechanism, not shown, but at relatively increased speeds. In the embodiment of the invention under discussion, the intermediate roll 17 is of relatively large diameter, and the axis of roll 18 is at a much greater distance from the axis 12 than is the axis of roll 17 from the front roll 11, so that, in passing to the nip of rolls 11, 12, the roving is supported for a considerable distance by the surface of roll 17, after leaving the nip of rolls 17, 18.

The top rolls 12 and 18 are loose in bearings, adjustably secured to the cap bars 16, which are hinged or fulcrumed on the pivots 161 (supported by the blocks 13) and held as to position by stops 162.

In conjunction with the intermediate bottom roll 17, I employ a gravity plate or cap 20, which, in Figure 1, has a smooth concave under face so as to fit upon said roll and press said roll and press the yarn thereagainst. Each cap or plate has arms 21 which have semi-circular loops 22, straight portions 23 and right angle extremities 24. The loops are sprung into engagement with the trunnions 25 of the roll 18, so that the plate has a loose pivotal movement about the said trunnions, whereby it may accommodate itself to and rest loosely upon said roll 18 and against the yarn thereon, and yet is held against accidental dislocation. The right angle extremities or fingers 24 are loosely engaged with notches 26 in a traverse bar 27, which, by the usual automatic mechanism, not shown, is longitudinally reciprocated slowly in a direction transverse to the path of movement of the roving. This traverse bar may be provided with the usual condenser guides or eyes for the yarn. As the bar is reciprocated, the caps or plates are moved with it.

Each cap is preferably provided with a condenser guide or eye 28 formed on the end of an arm 29 as shown in Figure 5.

The small top roller 18, working in connection with the lower large roller 17,

serves not only to draw out or attenuate the roving or sliver from the preceding pair of rollers 14, 15, but also to push or start it well in its forward passage under the cap or plate 20, the rear edge of which should come reasonably close to the nip or point of contact of the two rollers.

After passing under the top roller 18, the roving or sliver remains continually in contact with the surface of the lower roller 17 throughout its passage under the cap or plate 20 and continues to move forward without any assistance from the rollers in front, no matter how lightly the cap or plate may rest upon it. The tips of the fibers at the extremity of the sliver or roving are thus presented to the nip or point of contact of the pair of drawing rollers 11, 12, in front, which, revolving with a considerably higher rate of surface speed than that at which the sliver or roving is presented to them, draw forward the fibers as they are thus extended to them. The cap or plate resting on the roving or sliver serves to hold back other fibers from going forward until they are actually seized by the front rollers, though they are not actually held between the nip of the small top roller and the lower roller on which it rests. By this means, much greater or longer drafts can be obtained than in the ordinary system where the longest fibers are in suspension between the rollers without means to prevent some of the shorter fibers from being carried along therewith. A further advantage is that, when once set in position, practically no adjustment is necessary to suit different lengths of fiber.

In the embodiment of the invention shown in Figure 3, I employ two caps or plates 20, 31, one for the intermediate bottom roll 17 and one for the rear bottom roll 30, which in this case is preferably of large diameter. The cap or plate 20, except for details in the construction of its arms, is substantially like that in Figure 1. The plate 31 is hinged to a presser member 32 which serves as the substitute for or equivalent of a top roll. Said member 32 has hooked arms 321 which are sprung into engagement with a pivot bar 322. A two arm lever is mounted on said bar, and one arm 323 is curved and provided with a foot to rest against the member 322 and hold it yieldingly against the roll 30. The other arm 324 is curved and provided with weight 325 suspended therefrom by a connection 326. The cap or plate 31 and the press member 32 have smooth concave faces complemental to the convex peripheral face of the roll 30. The bar 322 may also serve as a traverse bar. The traverse bar 27, with notches in which the fingers on the cup or plate are loosely engaged, is reciprocated as usual. In this embodiment of the invention, I employ a supplemental bottom roll 35, so located and spaced from intermediate roll 17, that the intermediate top roll 18 may rest loosely against both rolls by gravity, being held against endwise movement by stops 36 placed adjustably on the top bars 16. In this case, the nip of the roll 30 and member 32 is at a relatively great distance from the nip of rolls 18, 17, and the roving between them is supported in part by the roll 30 and in part by the supplemental roll 35. The latter may be mounted loosely, if desired, so as to be rotated by the roll 18, which, in turn, is rotated by the roll 17.

In conjunction with the bottom roll or rolls, to increase the length of the supporting surface for the yarn, I may employ endless bands. For example, in Figure 4, on the intermediate bottom roll 40, I employ an endless band 41, passing around an idler roll 42 and a loose takeup roll 43, the latter being confined between the webs 430, 44, of an angle iron bar. The web 430 affords a table to prevent the upper stretch of the band from sagging, and along its edge has a socket for the roll 42. In this case, the cap or plate 45 is formed to lie flat against said upper stretch of the band, the loops of its arms are sprung over a pivot bar 46, and its fingers are engaged with the traverse bar 47.

In each instance, as herein described, I provide a hinged gravity plate which engages the moving or travelling surface, with which a top roll is also engaged, so that the attenuation and elongation of the yarn is secured as already described. The bottom traveling surface is of relatively great extent and the upper surface of relatively small extent so that the plate as well as the upper surface may engage the roving as supported by the bottom surface. Furthermore, in each case, by adjusting the roll or the pivot bar on which the cap or plate is hung, the cap or plate may be adjusted concentrically about the axis of the roll with which it cooperates.

What I claim is:—

1. In a drawing mechanism for yarn, the combination with a pair of drawing members, of a loosely pivoted gravity plate resting loosely on the lower member and the roving supported thereby.

2. A roving-engaging cap plate for a drawing mechanism having looped bars by which it may be pivotally and detachably hung upon suitable pivots.

3. In a drawing mechanism, end rolls and a pair of coacting intermediate rolls for supporting and feeding a roving, and a cap resting by gravity on the roving as it passes over one of said intermediate rolls.

4. In a drawing mechanism, a pair of rolls between which a roving may pass, and a cap resting on the roving while supported by the

lower of said rolls beyond the nip of said rolls in the direction of movement of said roving.

5. In a drawing mechanism, a pair of rolls between which a roving may pass, a cap resting on the roving while supported by the lower of said rolls beyond the nip of said rolls in the direction of movement of said roving, and a traverse bar to which said cap is connected to be traversed thereby.

6. A drawing mechanism comprising a bottom roll, a supplemental bottom roll, a top roll cooperating with said bottom rolls, and a retarding member carried by said top roll and resting on a roving passing over said bottom rolls.

7. A drawing mechanism comprising a bottom roll, a supplemental bottom roll, a top roll cooperating with said bottom rolls, and a retarding member carried by said top roll and resting on a roving as it passes over one of said bottom rolls.

8. A drawing mechanism comprising a bottom roll, a supplemental bottom roll, a top roll cooperating with said bottom rolls, and a retarding member carried by said top roll and resting on a roving as it passes over the forward one of said bottom rolls.

9. A drawing mechanism comprising a pair of movable surfaces for supporting a roving, an upper traveling surface cooperating with said pair of surfaces to feed the roving therebetween, and roving retarding means cooperating with one of said pair of surfaces.

In testimony whereof I have affixed my signature.

ARTHUR CECIL BUTLER.