Nov. 11, 1947. V. A. BURNHAM 2,430,706

TOP ROLL WEIGHTING MECHANISM

Filed Jan. 25, 1946

Fig. 1.

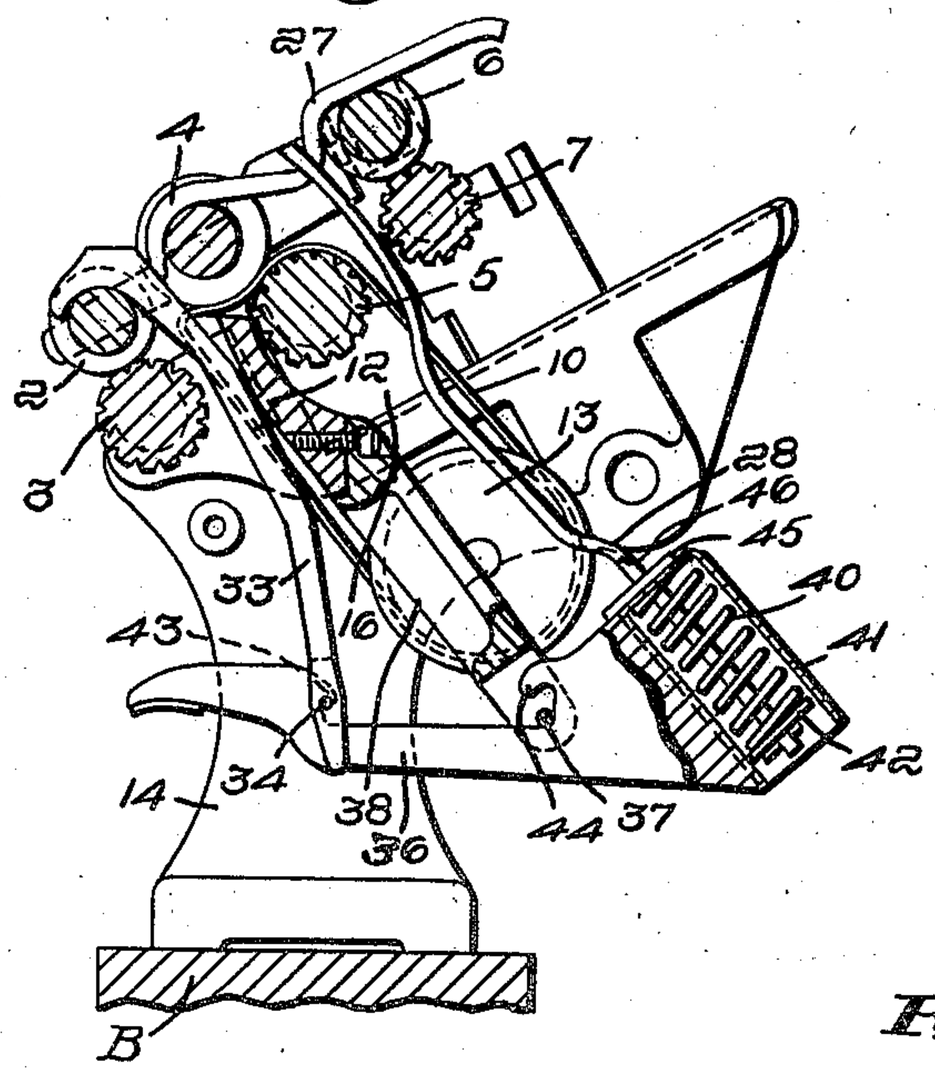


Fig. 2.

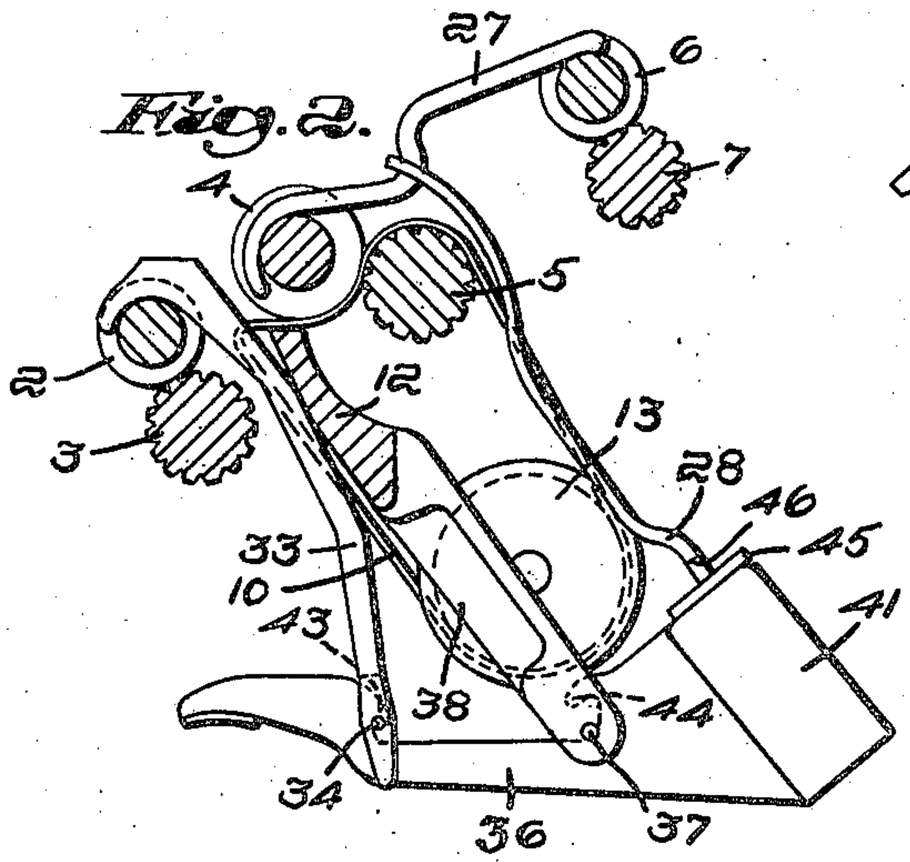


Fig. 3.

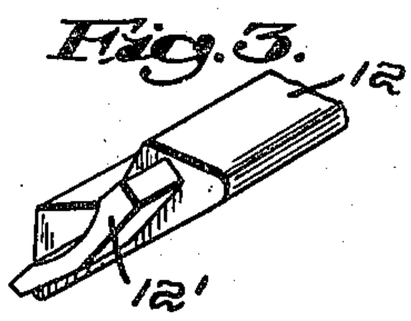
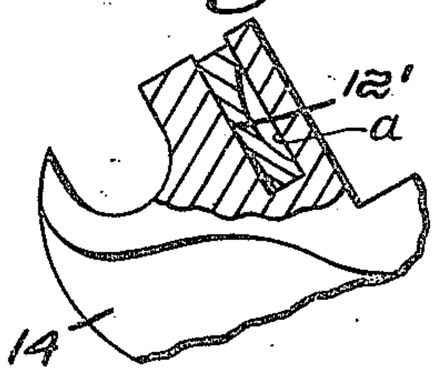


Fig. 4.



Inventor:
Virgil A. Burnham,
By J. H. McCready,
Attorney.

Patented Nov. 11, 1947

2,430,706

UNITED STATES PATENT OFFICE

2,430,706

TOP ROLL WEIGHTING MECHANISM

Virgil A. Burnham, Saco, Maine, assignor to Saco-Lowell Shops, Boston, Mass., a corporation of Maine

Application January 25, 1946, Serial No. 643,273

12 Claims. (Cl. 19—136)

1

This invention relates to means for weighting the top rolls of drawing mechanisms of the type used in spinning and roving frames.

It aims to devise an exceptionally simple and reliable weighting mechanism which will be self-contained and in which the pressure can be released quickly and conveniently, when desired. A further object of the invention is to provide a weighting apparatus of this type in which adjustment of the weighting devices will be made automatically with changes in the roll spacing, and in which, also, the entire weighting mechanism will be supported out of contact with the roller beam, thus reducing both the expense of manufacture and installation and, also, the labor involved in keeping the frame clean.

The nature of the invention will be readily understood from the following description when read in connection with the accompanying drawings, and the novel features will be particularly pointed out in the appended claims.

In the drawings,

Fig. 1 is a vertical, sectional view of a drafting mechanism of the type above referred to, equipped with weighting means embodying this invention;

Fig. 2 is a view, similar to Fig. 1, illustrating the relationship of the parts when the rolls are spaced widely from each other;

Fig. 3 is a perspective view of an end portion of the apron bar forming one element of the construction shown in Figs. 1 and 2; and

Fig. 4 is a view, partly in side elevation and partly in section, showing the manner in which the apron bar is supported.

The drawings illustrate this invention as applied to an apron drafting mechanism of the character shown in the Shaw Patent No. 2,329,655, dated Sept. 14, 1943, and assigned to the assignee of the present invention. Its utility, however, is not limited to this specific drafting mechanism.

Referring first to Fig. 1, the construction there shown comprises a series of pairs of upper and lower drafting rolls arranged to act successively on a strand of roving, sliver, or the like, hereinafter usually referred to as "sliver." These rolls comprise front, top and bottom rolls 2 and 3, intermediate rolls 4 and 5, and rear rolls 6 and 7. The bottom rolls are supported in roll stands, one of which is shown at 14, and they are connected with mechanism for revolving them at successively higher speeds from rear to front, as is usual in mechanisms of this type. Usually the lower

2

front roll is supported directly in the roll stand castings, while the bottom, rear and intermediate rolls are supported in bearing blocks adjustably mounted on said castings, one of these blocks being shown in Fig. 1 at 16. The top rolls 2, 4 and 6 are held in cooperative relationship with their respective bottom rolls in any convenient manner as, for example, by the usual cap bars. The middle set of drafting elements includes a belt or apron 10 running over, and driven by, the lower middle roll 5, then extending forwardly from this roll over an apron guiding bar 12 and around a tensioning roll 13. In this mechanism, therefore, the intermediate bottom roll does not directly engage the sliver, although its rotative movement is utilized in acting on the sliver through the apron to feed the fiber. So far as the mechanism above described is concerned, it is like that shown in the Shaw patent above designated.

The weighting mechanism provided by this invention comprises a front stirrup 33, terminating at its upper end in a hook-shaped saddle member which rides on the neck portion of the front top roll 2, and a rear stirrup 28 loosely connected with the saddle 27, which weights the intermediate and rear rolls 4 and 6. At their lower ends these two stirrups are connected by a lever 36, fulcrumed on a pin 37, which is secured in the lower slotted end of an arm 38, the latter being screwed, or otherwise secured rigidly to the stationary apron bar 12. A single spring 40 acts on the stirrup 28 and also, through the lever 36, on the front stirrup 33 to exert a downward pull on both of these stirrups and thereby to apply the necessary loading pressure to the three top rolls. In the particular mechanism shown the spring 40 is of the compression type and it is enclosed in a rear tubular section 41 of the lever 36 with its lower end bearing against a washer 42, Fig. 1, fastened to the lower end of the stirrup 28, and its upper end abutting against the inwardly turned flange or rim of the tubular section 41. Its inherent tendency to expand, therefore, results in forcing the stirrup 28 downwardly and the rear end of the lever 36 upwardly. This latter force tips the lever on its fulcrum in a direction to pull the front stirrup 33 downwardly.

In order to provide for the quick release of the top rolls from the weighting mechanism, when desired, the forward end portion of the lever is provided with a hook 43 which releasably engages a pin 34 carried by the stirrup 33. Removal

of the loading pressure from the rolls is accomplished merely by lifting the forward end of the lever 36 far enough to unhook it from the stirrup 33, whereupon the expansion of the spring 40 swings the front end of the lever downwardly around the pivot 37 until the pressure of the saddle 27 on the rolls with which it cooperates is relieved except for the slight weight of the parts suspended from it. If the saddle 27 is removed from the stirrup 28, or the latter is otherwise freed, the lever will drop until a hook 44 on an intermediate part of the lever engages the fulcrum pin 37.

A washer 45 loosely encircling the lower part of the stirrup 28 is arranged to be engaged by a shoulder 46 just above the washer to limit the downward movement of the stirrup 28 and the expansion of the spring when the weighting mechanism is in an idle or inoperative condition.

The apron bar 12 is supported in the manner described in the patent above designated and as indicated in Figs. 3 and 4. That is, its ends are equipped with tongues like that shown at 12' to enter slots, one of which is shown at *a*, in Fig. 4, formed in each of the roll stands immediately behind the lower front roll 3.

While the drawings show only one set of drafting rolls, it will be understood that in the orthodox spinning and roving frames a long line of these rolls are arranged and customarily are connected together so that they all operate in unison. In fact, usually two lines of these drafting rolls are arranged at opposite sides of the machine. Also, in the event that the invention is applied to a drafting mechanism which does not include an apron, a bar carrying or suporting the arms 38 on which the levers 36 are fulcrumed can still be included in the machine organization.

From the foregoing it will be evident that this weighting mechanism is not only extremely simple, but is entirely self-contained. In other words, it is free from attachment to the roller beam or other frame parts and is supported only by the rolls and by its connection with the arm 38 which, in turn, is supported on the bar 12 that forms a part of the superstructure of the roll-supporting mechanism. This arrangement, plus the simplicity of the mechanism, contributes both to economy of manufacture and installation, and materially reduces the labor of cleaning. It should also be observed that this mechanism is self-adjusting to variations in the spread or spacing of rolls. That is, when such an adjustment of spacing is made, the stirrups simply are swung automatically toward or from each other, depending upon whether a wider or narrower spread of the rolls is produced, but no independent adjustment of the weighting mechanism itself is required. At the end of the day, or at any time when the loading of all the rolls in the frame is to be released, that is accomplished merely by unhooking the forward ends of the levers 36 from their respective stirrups 33. And the re-application of pressure is accomplished just as simply by hooking the levers up again to the front stirrups.

It should also be noted that the entire weighting mechanism is free of any rigid attachment to any fixed part of the machine. Both saddles are free to take positions determined by their mutual response to the reaction of the spring, and this freedom also is useful in permitting the weighting mechanism to align itself with the rolls on which it acts.

When a shell type top front roll is used it can be end weighted, as by a T-shaped saddle, and

the shank of such a saddle will cooperate with the pin 34 exactly as does the lower hook end 43 of the front stirrup 33, the shank forming a stirrup for its particular type of saddle.

While I have herein shown and described a preferred embodiment of my invention, it will be evident that the invention is not limited to embodiment in the particular form shown.

Having thus described my invention, what I desire to claim as new is:

1. The combination with a series of pairs of upper and lower drafting rolls arranged to act successively on a strand of sliver to draft it and means for operatively supporting said rolls, of a weighting mechanism for the top rolls of said series, comprising a pair of stirrups, arranged one behind the other, weighting members bearing on the rolls, said stirrups being connected to said members, a lever connecting the lower portions of said stirrups, and a spring cooperating with said lever to exert a downward pull on both of said stirrups, the entire weighting mechanism being free from attachment to the roller beam.

2. A combination according to preceding claim 1, in which said lever is fulcrumed on a part of the superstructure of the roll supporting means.

3. The combination with a series of pairs of upper and lower drafting rolls arranged to act successively on a strand of sliver to draft it, and roll stands supporting the lower rolls of said series, of a weighting mechanism for the top rolls of said series comprising a pair of stirrups, positioned one behind the other, for weighting the latter rolls, a lever fulcrumed on a member supported by said roll stands, said lever normally connecting the lower portions of said stirrups, and a spring cooperating with said lever to exert a downward pull on both of said stirrups, the entire weighting mechanism being free from attachment to the roller beam.

4. The combination with a series of pairs of upper and lower drafting rolls arranged to act successively on a strand of sliver to draft it, and roll stands supporting the lower rolls of said series, of a weighting mechanism for the top rolls of said series comprising a pair of stirrups, positioned one behind the other, for weighting the latter rolls, a lever fulcrumed on a member supported by said roll stands, said lever normally connecting the lower portions of said stirrups, and a spring connecting one end of said lever with one of said stirrups and cooperating with the lever to exert a downward pull on both of said stirrups.

5. The combination with a series of pairs of upper and lower drafting rolls arranged to act successively on a strand of sliver to draft it, and roll stands supporting the lower rolls of said series, of a weighting mechanism for the top rolls of said series comprising a pair of stirrups, positioned one behind the other, for weighting the latter rolls, a lever fulcrumed on a member supported by said roll stands, means releasably connecting the lower end of said front stirrup with said lever, and a spring connecting the rear end of said lever with said rear stirrup.

6. The combination with a series of pairs of upper and lower drafting rolls arranged to act successively on a strand of sliver to draft it, and roll stands supporting the lower rolls of said series, of a weighting mechanism for the top rolls of said series comprising a pair of stirrups, positioned one behind the other, for weighting the latter rolls, a lever fulcrumed on a member supported by said roll stands, means releasably con-

necting the lower end of said front stirrup with said lever, and a compression spring housed in a portion of said lever and acting both on the lower part of said rear stirrup and also on said lever to apply a downward pull to both of said stirrups.

7. The combination with a series of pairs of upper and lower drafting rolls arranged to act successively on a strand of sliver to draft it, and roll stands supporting the lower rolls of said series, of a weighting mechanism for the top rolls of said series comprising a pair of stirrups, positioned one behind the other, for weighting the latter rolls, a bar supported in said stands, an arm extending downwardly from said bar, a lever fulcrumed on said arm, said lever normally connecting the lower portions of both of said stirrups, and a spring cooperating with said lever to apply a downward pull to both stirrups.

8. A combination according to preceding claim 7, in which said lever is releasably hooked to said front stirrup.

9. A combination according to preceding claim 7, in which said lever is releasably hooked to both said front stirrup and said arm.

10. A combination according to preceding claim 7, in which said spring is of the compression type and is housed in the rearward end portion of said lever where it reacts on the lever and said rear stirrup to weight both of said stirrups, and the forward portion of said lever is releasably connected to the front stirrup.

11. The combination with a series of pairs of upper and lower drafting rolls arranged to act successively on a strand of sliver to draft it and means for operatively supporting said rolls, of a weighting mechanism for the top rolls of said

series, comprising a pair of stirrups, arranged one behind the other, weighting members bearing on the rolls, said stirrups being connected to said members, a lever connecting the lower portions of said stirrups, and a spring cooperating with said lever to exert a downward pull on both of said stirrups, the entire weighting mechanism being free from rigid attachment to any fixed part of the machine.

12. The combination with a series of pairs of upper and lower drafting rolls arranged to act successively on a strand of sliver to draft it and means for operatively supporting said rolls, of a weighting mechanism for the top rolls of said series, comprising a pair of stirrups, arranged one behind the other, weighting members bearing on the rolls, said stirrups being connected to said members, a spring, and means connecting the opposite ends of said spring with said respective stirrups in such a manner as to exert a downward pull on both stirrups, both of said stirrups being free to move in response to the reactive force of said spring.

VIRGIL A. BURNHAM.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,944,965	Casablancas	Jan. 30, 1934
2,071,023	Calvert	Feb. 16, 1937
2,323,882	Shaw	July 6, 1943
2,343,259	Jones et al.	Mar. 7, 1944
2,381,856	Rabasa	Aug. 7, 1945