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ROLL LOADING SYSTEM FOR TEXTILE DRAFTING AND SPINNING FRAMES

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FIG. 1.

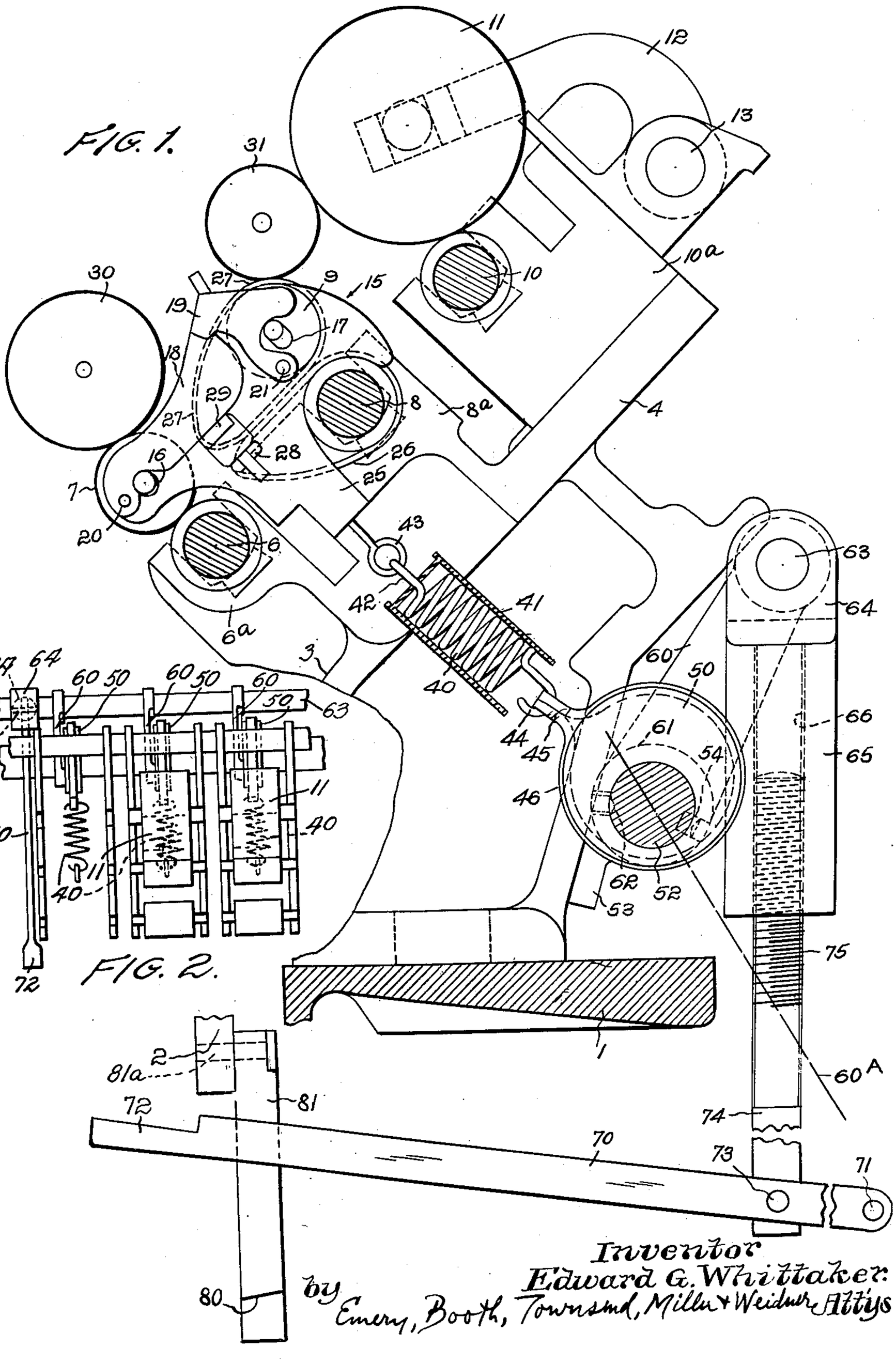

FIG. 2.

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ROLL LOADING SYSTEM FOR TEXTILE DRAFTING AND SPINNING FRAMES

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3 Claims. (Cl. 19—135)

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This invention relates to textile roll frames for drafting and spinning purposes. It aims to provide an improved system and means for loading and relieving at will certain of the upper drafting elements which overlie the path of draft. This application is a continuation in part of copending application Serial No. 9,694, filed February 20, 1948, now U. S. Patent No. 2,532,275, dated November 28, 1950.

On the drawing, Fig. 1 is an end elevation partly in cross-section of a roll frame, in this instance a spinning frame, illustrating one embodiment of the invention; Fig. 2 is a partly diagrammatic plan view showing a multiplicity of aligned roll sets and load-controlling parts associated with the operator-controlled means to apply or to relieve the spring load with respect to such multiplicity.

Referring to the drawing in more detail, the spinning frame shown by way of example is similar to that of the copending application above identified, now Patent No. 2,532,275 the main table being seen at 1 and a portion of the spindle rail at 2. One of the roll stands is designated generally at 3, a series thereof being distributed along the table 1 in appropriately spaced relation. The exemplary frame of the drawing is equipped with roll sets arranged in three lines or pairs, and including front, intermediate and back lower rolls 6, 8 and 10 and cooperating front, intermediate and back top rolls 7, 9 and 11. The shafts of the driven lower rolls are rotatably received in bearings 6*a*, 8*a* and 10*a* on the bed 4 of the roll stand 3. The top back roll 11 which may be common to a plurality of lines of draft is held on a cap bar 12 pivoted as at 13 in a bracket on the lower rear bearing block 10*a*.

In the present example the front and intermediate top rolls 7 and 9 are unitarily held in a cradle or carrier designated generally at 15, more fully disclosed and claimed in the copending application mentioned. This plural-roll carrier has bearing slots 16, 17 at the front and rear portions for the corresponding top rolls 7 and 9. Releasably interlocking top covers 18, 19 pivoted on the carrier at 20, 21 retain these rolls in operative position. The carrier 15 further comprises a central lower portion 25 depending between the front and intermediate lower roll lines 6 and 8. As illustrated the drafting elements include paired lower and upper aprons 26, 27 respectively encompassing the lower and upper intermediate rolls 8, 9 and extending forwardly toward the front roll pair, with the front portions guided about lower and upper apron extenders 28, 29 mounted on the cradle 15. Rotary top clearers

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are indicated partly diagrammatically at 30 and 31.

The loading or "weighting" system of the present invention is especially suited for use with roll-frames having plural-roll carrier or cradle assembly units as above described, it being noted that one such carrier unit is furnished for each roving sliver or line of draft, such carrier units being distributed longitudinally along the frame as more fully shown in my copending application, now Patent No. 2,532,275. It is, however, applicable as well to other types and constructions of top roll carriers, whether with or without aprons, including carriers for a greater or less number of top rolls than the twin or tandem unitary arrangement here shown.

Turning now more particularly to the loading mechanism, the main element of the latter comprises a coil spring loader or tensioner 40 acting between the carrier 15 and a variably positionable tensioning and de-tensioning means. For protective and guiding purposes the spring 40 desirably is enclosed in a cage 41 within which it is free to expand or to contract in the axial direction.

The carrier-loading spring 40 is disposed with the axis generally perpendicular to the path of draft. The upper end is formed or provided with a hook 42 releasably engageable in an eye 43 on the carrier 15, herein having threaded attachment to the lower carrier portion 25. The other or lower end of the spring 40 is integrally or otherwise provided with a hook 44 releasably engaging a receiving aperture in a radial projection 45 on a circular strap or collar 46. This collar 46 is snugly but freely fitted about the grooved periphery of an eccentric or cam 50 on a rock shaft 52 the turning of which in one or the opposite directions imposes or relieves the tensioning action with respect to the spring 40.

In the position illustrated the spring 40 is assumed to be substantially de-tensioned, the broader portion of the eccentric 50 having been turned counter-clockwise toward the spring.

One such loading device including a spring 40 and eccentric cam 50 is provided for each carrier 15 of the particular frame. If individual control is desired for each carrier or for a number less than all thereof the rock shaft 52 may have independent sections with manual operating means for each section. Preferably the rock shaft 52 is of a length to accommodate the cams 50 for groups of adjacent carriers and it may extend the full length of the frame so as to operate all of the cams. Suitable bearing support for the shaft is provided at the lower back portion of the

roll stands 3 as by bearing brackets 53. The several eccentrics 50 are each adjustably held in angularly fixed position on the corresponding portion of the single- or plural-section shaft as by means of lock studs 54.

Means conveniently available to the operator is provided for rotatively shifting the eccentrics 50 to tension or de-tension the corresponding carriers. Such means may be installed at one or more convenient locations along the frame and in the instance of individual or group control a hand lever, crank or the like may be provided for each eccentric. In the accompanying drawing foot-operated means is illustrated for the purpose including a short lever 60 having at one end a collar 61 adjustably held in fixed angular position on the rock shaft 52 as by a set screw 62. The other end of the lever 60 is pivotally connected as at 63 to the forked upper end 64 of a connector 65 having a threaded longitudinal socket 66.

The manual control means illustrated further comprises a treadle having one end pivoted as at 71 on a convenient stationary portion of the frame the opposite end being extended to the front of the frame and there presenting a pedal 72. It is noted that in the drawing a major portion of the height of the frame is broken away to conserve space. At an intermediate portion of the treadle 70, a rear portion of which is broken away, there is pivotally attached as at 73 the lower end of an operating rod 74 having threaded connection as at 75 with the threaded socket 66 of the connector 65. By reason of the threaded connection the spacing between the treadle 70 and the operating lever 60 may be adjusted to vary the throw of the cam and correspondingly to regulate the degree of spring tensioning.

As stated the spring 40 is shown in relieved or substantially maximum contracted condition, the broad portion of the eccentric 50 being turned toward it and the operating lever 60 being elevated. Depression of the treadle 70 rocks the shaft 52 clockwise, turning the broad portion of the eccentric 50 away from the spring and consequently extending the latter. The center line of the lever 60 in the depressed position thereof is represented by the broken line at 60*a*. Hold-down means for the treadle desirably is provided, such as the latch 80 on a leg 81 pivoted as at 81*a* on the spindle rail 2 or other convenient portion of the frame, the latch having a normal treadle hold-down position to which it is urged by gravity, spring means or otherwise. Thus during operation the loading system is locked in carrier-tensioning status. On releasing the latch 80 the shaft means 52 may be turned to spring-relieving position shown, this action and attendant raising of the treadle generally taking place automatically under the influence of the spring 40.

With the parts adjusted as in the drawing the spring-loading is applied by depressing the pedal, the latter being locked down during running of the frame. When the frame is not in use it is desirable that the loading of the carriers be relieved, and said arrangement facilitates such manner of control. However, it will be apparent that by appropriate adjustment of the angular position of the eccentrics 50 and of the lever or levers 60 upon the shaft 52 the opposite action may be had, namely, relieving of the spring load by depression of the treadle.

The spring-loading means of the invention is especially adapted to long-drafting spinning systems and particularly where leather or other endless belts or aprons are employed, in connection with which greater pressures for the top elements are necessary. Heretofore the pressure has generally been achieved by using dead weights which of themselves greatly add to the overall mass and weight of the frame, this loading weight by itself frequently mounting to 700 lbs. or more for a frame of 384 spindles by way of example. By utilizing spring energy to accomplish the loading or "weighting" in accordance with the present invention the total weight of the frame is importantly reduced.

My invention is not limited to the particular embodiment thereof illustrated or described herein, and I set forth its scope in my following claims:

1. For textile drafting and spinning frames having a multiplicity of axially aligned sets of lower and upper rolls, each such roll set having an overlying carrier for one or more upper rolls, mechanism simultaneously operable for all the several sets for loading and at will relieving such upper roll carrier and the rolls thereof, comprising in combination, a rock shaft extending lengthwise of the frame, longitudinally aligned spaced bearings on the frame rotatably supporting the shaft, eccentrics adjustably fixed on the shaft, one for each roll set, a collar loosely surrounding each eccentric, a coil spring having the opposite ends connected respectively to the carrier and to the eccentric collar for each roll set, and operator-controlled means to turn the shaft thereby to apply or to relieve the spring load with respect to all the carriers.

2. Mechanism according to claim 1 wherein the operator-controlled means includes a treadle, a radial lever angularly adjustably fixed on the shaft and an adjustable connecting rod between the treadle and lever.

3. A top-roll carrier loading system for textile roll frames having a plurality of roll and upper carrier sets distributed lengthwise along them, comprising for each carrier a coil spring connected at one end to the lower portion thereof and a spring conditioning unit connected to the other end of the spring, said unit including an eccentric cam and encompassing collar, a common rock shaft element extending lengthwise of the frame and having the cams of the conditioning units angularly fixed thereon each with capacity for individual angular adjustment, and manual means to turn the shaft element in one and the opposite direction thereby simultaneously to rock all of the eccentric cams to tension and de-tension the carriers accordingly.

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