May 5, 1925. 1,536,047

W. W. ARNOLD, JR

TENSION REGULATOR FOR SECTION BEAMS ON SLASHER AND BEAMER CREELS

Filed April 12, 1924 2 Sheets-Sheet 1

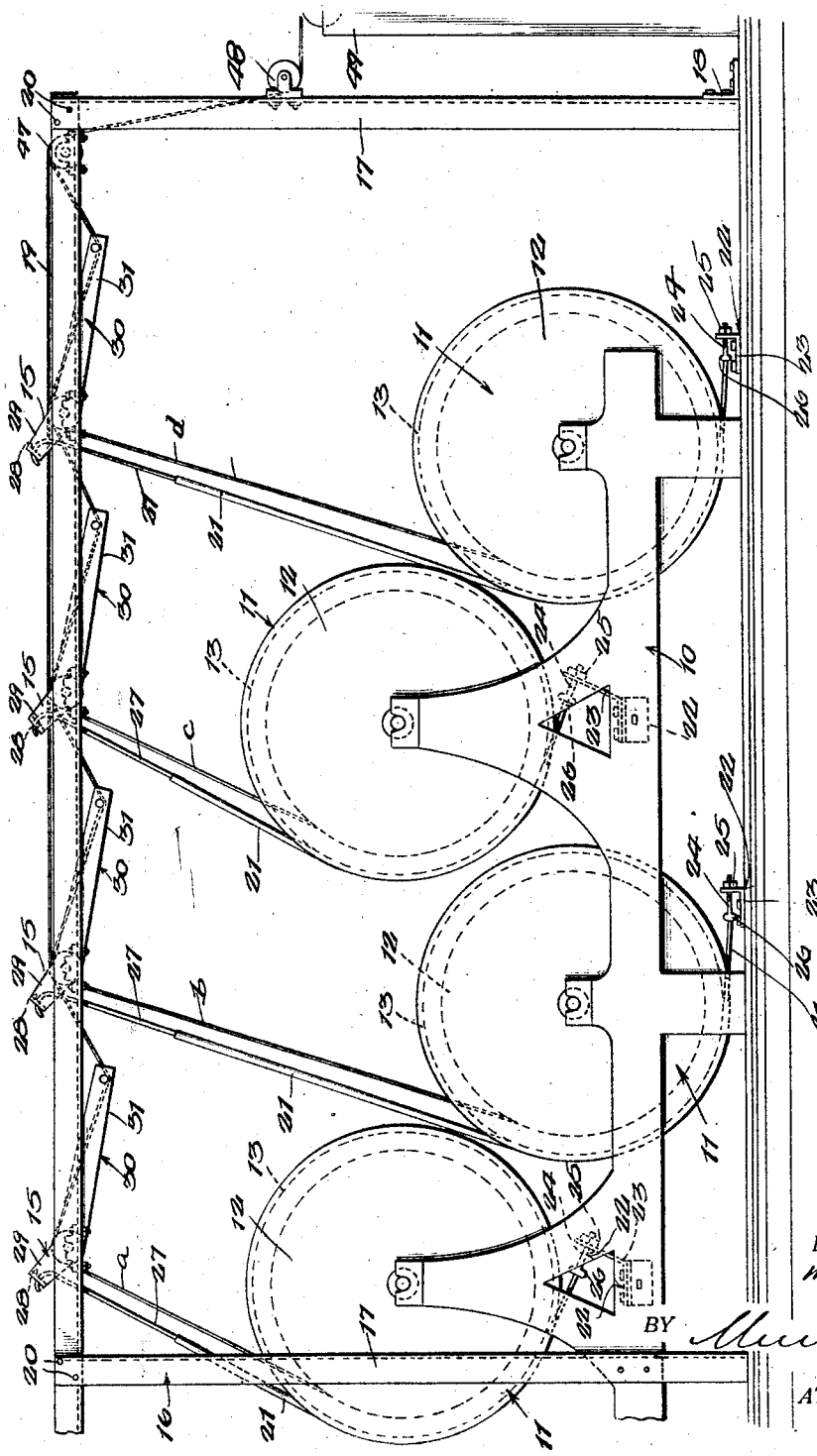

FIG. 1.

INVENTOR
W. W. ARNOLD, JR.
BY Munn & Co.
ATTORNEYS

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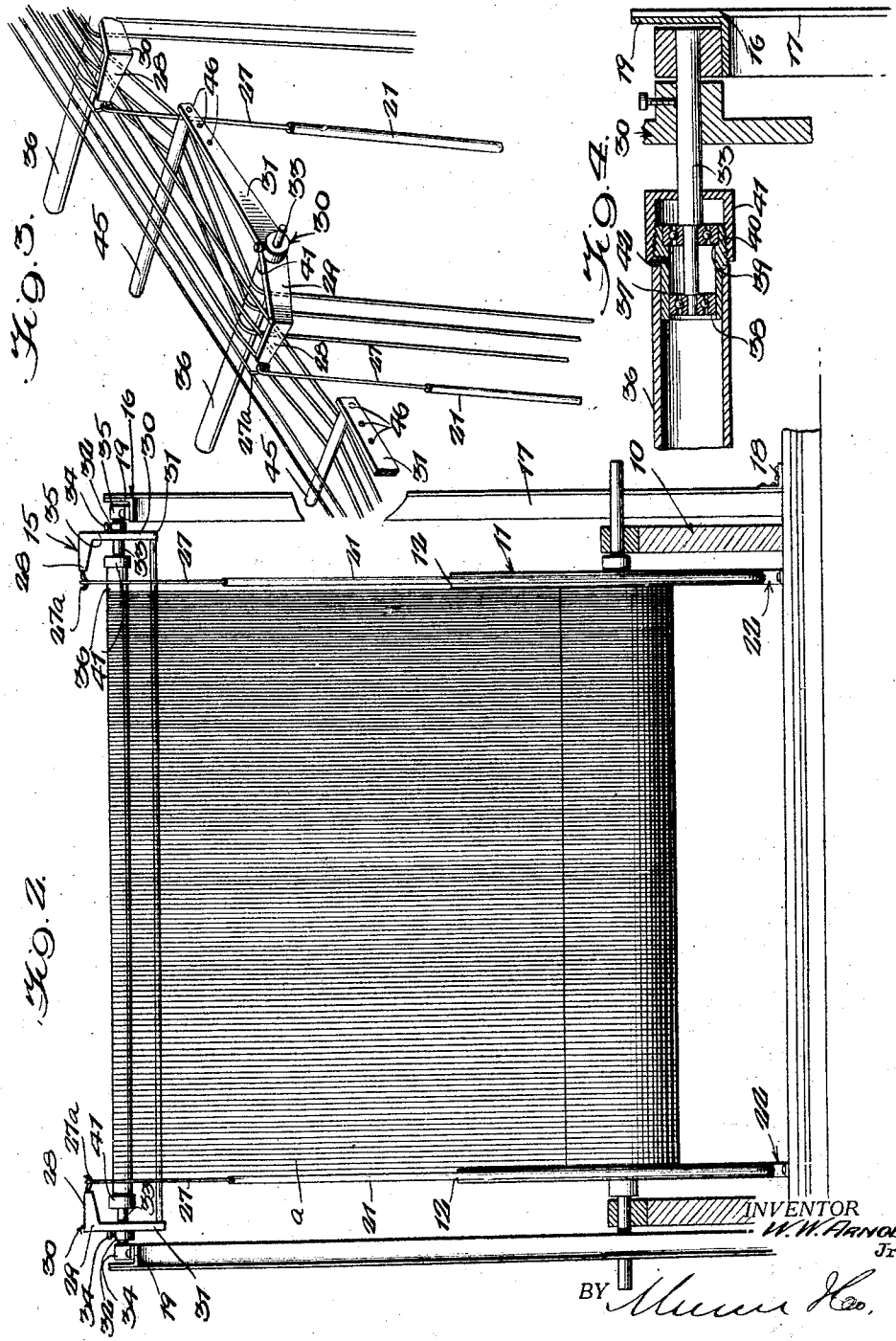

Fig. 2.

Fig. 3.

Fig. 4.

INVENTOR
W. W. Arnold Jr.
BY Munn & Co.
ATTORNEYS

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UNITED STATES PATENT OFFICE.

WILLIAM WYLIE ARNOLD, JR., OF MANCHESTER, GEORGIA.

TENSION REGULATOR FOR SECTION BEAMS ON SLASHER AND BEAMER CREELS.

Application filed April 12, 1924. Serial No. 706,162.

To all whom it may concern:

Be it known that I, WILLIAM WYLIE ARNOLD, JR., a citizen of the United States, and a resident of Manchester, in the county of Meriwether and State of Georgia, have invented certain new and useful Improvements in Tension Regulators for Section Beams on Slasher and Beamer Creels, of which the following is a specification.

This invention relates to a tension regulator for section beams on slasher and beamer creels.

Heretofore in this art an attempt has been made to regulate the tension of the yarn in machines of this character by providing peripheral grooves in the section beam heads and by disposing in such grooves ropes or bands, each rope or band being anchored or fastened stationary on one end and carrying a weight at its other end, whereby to exert a braking effect on the section beam and consequently set up some degree of tension in the yarns. With such arrangements however a uniform tension on the yarns cannot be obtained, due to the fact that when the beam is full, more friction is required on the beam head since the yarn which is pulled from the beam acts on the same through a greater lever arm at such time. As the diameter on the yarn decreases less friction is required since the yarn acts on the beam through a shorter lever arm but there is no provision made in the devices heretofore used for reducing the friction on the beam head. Moreover in the machines heretofore used, the yarns on the section beams of the creel back of the front beam have been made to pass either under and over or over and under the section beams lying forward thereof and thus exert a propelling force on such forward beams and incidently tend to vary in an undesirable manner the tension of the yarn.

The primary object of this invention is to provide a tension regulator for slasher and beamer creels which obviates all of these disadvantages and which maintains a constant and uniform tension on each sheet of yarn as it is unwound from its section beam in either a slasher or beamer creel, and which is entirely automatic in its operation.

Another object is to provide a tension regulator of this character wherein the tension is maintained on the sheet or sheets of yarn without causing the individual threads in the sheet or sheets to roll or spread.

Another object is to provide a tension regulator of this character which maintains the tension in the manner set forth without requiring the aid of springs or adjustable weights.

A further object is to provide a tension regulator of this character by which the individual sheets of yarn can be unwound from the beams at a uniform and constant tension and pass collectively through the size box or friction roll (as used in a slasher or beamer) without decreasing or increasing the width of the sheet which would cause the yarn to either pile up or spread.

A still further object is to provide a tension regulator of this character and having these advantages and by which each individual sheet of yarn is unwound from its beam at a uniform and constant tension even though the diameter of the yarn on the beam varies throughout the width of the beam.

A still further object is the provision of a tension regulator of this character by which the individual sheets of yarn can be unwound from the beams at a uniform tension, thereby preventing a varying amount of stretch in the individual sheets of yarn and thus greatly reducing the amount of yarn which would otherwise be left on some of the beams and consequently removed as waste.

Other objects and advantages of the invention reside in certain novel features of the construction, combination and arrangement of parts which will be hereinafter more fully described and particularly pointed out in the appended claims, reference being had to the accompanying drawings forming part of this specification, and in which:

Figure 1 is a fragmentary view in side elevation, showing the invention applied to a slasher creel;

Figure 2 is a view in end elevation, the machine being viewed from the left-hand end, as shown in Figure 1;

Figure 3 is a fragmentary perspective view, illustrating the manner in which the yarn coacts with the tension regulator; and

Figure 4 is a fragmentary detail view,

partly in section and partly in elevation, showing the mounting of each end of the sleeve.

Referring to the drawings, the numeral 10 designates a creel on which section beams 11 are rotatably mounted. Each section beam 11 has a pair of heads 12 provided with peripheral grooves 13. A tension regulator is provided for each section beam, the tension regulators being designated generally at 15 and being suitably mounted on a single frame, designated generally at 16. The frame 16 is made up of upright angle bars 17 suitably fastened to the base, as at 18. In the arrangement shown two upright angle bars 17 are provided on each side of the creel frame, there being one angle bar 17 adjacent each end of the creel frame. Between the angle bars 17 on each side of the creel frame longitudinal angle bars 19 extend, the upper portions of the upright angle bars 17 being adapted to support the longitudinal angle bars 19 and being secured to such bars, as at 20. If it is found desirable transverse angle bars may also be employed and may be secured to the upright angle bars 17 on the opposite side of the creel.

The tension regulators 15 are all of identical construction so that a description of one will apply to all, and each includes a braking member 21, such as a rope or band having one end adjustably anchored or fastened, as at 22. Each adjustable anchor or fastening device 22 comprises a bracket 23 suitably secured to the creel frame or to the base depending upon the position of the section beam with which the braking member is associated. An adjusting screw 24 is adjustably connected to the bracket by means of a nut 25 and has a swivel connection 26 to one end of the braking member 21. It is to be understood that one such braking member 21 and adjustable fastening device or anchor 22 is provided for each head 12 of each section beam. The braking members 21 operate in the groove 13 of the heads 12 of the section beam.

The end of each braking member 21 remote from its adjustable fastening device or anchor 22 is connected by means of a hook 27 to a second hook 27^a threaded in or otherwise suitably fastened to an offset lug 28 formed at the extremity of the short arm 29 of a lever, designated generally at 30. The levers 30 also include long arms 31 and preferably the arms 29 and 31 are angularly disposed with respect to each other, as clearly shown in Figures 1 and 3 of the drawing. At the juncture of the arms 29 and 31, each lever 30 is formed with a hub 32 which is fitted on and secured to a supporting shaft 33 by a set screw 34. Each shaft 33 is constrained to rotative movement by virtue of its mounting in a bearing 35 provided therefor. One such shaft 33 is provided for each lever 30 and as a lever 30 is provided for each braking member 21 and as two braking members 21 coact with each section beam, a pair of levers 30 and a pair of shafts 33 are provided in the tension regulator which controls each section beam. The members of each pair of shafts 33 are axially alined though arranged on the opposite sides of the machine.

A guide sleeve 36 is loosely mounted at its ends on the members of each pair of shafts 33. The mountings employed for rotatably supporting the ends of the sleeve 36 on the shafts 33 are of identical construction and as shown in Figure 4 each includes a housing 37 pressed into the end of the sleeve. Ball bearing assemblies 38 and 39 are pressed into the housing 37 and onto the stepped end of the shaft 33. The housing 37 has an enlarged or shouldered portion 40 which projects exteriorily of the sleeve 36 and onto this portion 40 a dust and grease cup 41 is threaded. An oil or grease duct 42 is provided in the housing 37 to provide for lubrication of the mounting.

Adjacent the outer ends of the long arms 31 of each pair of levers 30, a roller shaft 45 is rotatably and tiltably mounted, the roller shaft extending transversely between the members of the pair of levers of the tension regulator and having its ends rotatably and tiltably received in any one of a series of openings 46 provided in the long arms 31 of these levers. The ends of the shaft 45 are reduced and the openings 46 are slightly larger than these reduced ends to permit the shaft 45 to rock or tilt longitudinally as well as to rotate. With this arrangement the levers 30 are mounted for independent movement about their respective shafts 33 for a purpose which will hereinafter appear.

The sheets of yarn of the several section beams are designated at *a*, *b*, *c* and *d*, and as shown each sheet of yarn is extended up over the guide sleeve 36 of its tension regulator and then down under the roller shaft 45 of its tension regulator and thence above the remaining tension regulators of the creel to the guide roll 47 at the forward end of the creel frame. All of the sheets of yarn pass down over the guide roll 47 and under a second guide roll 48 and thence into a size box, designated generally at 49, if the invention is applied to a slasher creel. Of course the size box is omitted if the invention is applied to a warper creel.

With this arrangement each beam has its own tension regulator and the proper tension is maintained in the yarn being unwound from each beam. Moreover the yarn of one beam does not tend to vary the tension of the yarn of the other beams.

In each tension regulator the roller shaft

45 floats on the yarns and the weight of this shaft and the greater weight of the arms 31 over the weight of the arms 29 tends to rotate the levers in a clockwise direction as viewed in Figures 1 and 3. If the tension in the yarn slackens this rotation of the lever 30 in a clockwise direction occurs, and consequently, the frictional engagement between the braking members 21 and the heads of the section beams is increased to increase the tension in the yarns being unwound from the section beams. In this manner a correct and uniform tension is maintained in each sheet of yarn. It often happens that in winding the yarn onto the section beams the yarn builds up higher on one end of the beam than on the opposite end making what is known in the art "a high-sided beam". Even with such a beam the tension regulator constituting the present invention provides for the maintenance of the proper tension throughout the width of the yarn being unwound for since the levers 30 are independently rockable the roller shaft 45 may tilt out of a horizontal plane to follow the transverse inclination of the yarn. This action is had without tending to spread or roll the sheets of yarn since the roller shafts 45 and the guide sleeves 36 are themselves freely rotatable to avoid this undesirable effect on the yarn. Moreover it is not necessary to use either springs or adjustable weights.

It will be understood that in this branch of the textile art the yarns on the section beams of the creel are passed through the size box and over the cylinders of the slasher and are then wound on the loom beams. If the slasher is omitted the yarns are wound directly on the loom beams, both the size box and the cylinders then being omitted. In either event the present invention may be used to advantage since the section beams in the creel are threaded up in the same manner in both instances. The present invention by maintaining a proper and uniform tension on the yarns prevents the same from kinking when the machine is being started or stopped and when the machine is in operation the yarns are made to lie smooth and in a uniform sheet throughout the machine.

By maintaining uniform tension on each sheet of yarn, practically all of the yarn on each beam will run off at the same time which greatly reduces the amount of yarn that would otherwise be left on some of the beams and which would have to be removed as waste.

In order to weave a smooth flat piece of cloth it is necessary to have an even tension on every thread of yarn on the loom beam on which the warp yarn is wound. Where there is a larger number of ends of threads in a warp, it is necessary to use more section beams in the slasher or beamer creel. The more beams used in a creel the greater the chances are of having an uneven tension on the yarn. With the tension regulator constituting the present invention, the same tension is maintained in every sheet of yarn irrespective of the number of beams used. As a consequence the appearance of the woven cloth is improved and also the amount of breakage in the loom due to too much tension on some threads and not enough on others is reduced to a large extent. Moreover the tension regulator is entirely automatic in its operation and requires practically no attention after it is once adjusted. It is to be noted that while it is proposed to adjustably mount the roller shaft 45 on the arms 31, it is only necessary to change the mounting of this roller when running an unusual heavy or an unusually light sheet of yarn from the section beam. When once the roller shaft is set for the work it will not be necessary to make any changes except under the conditions mentioned.

I claim:

1. In a tension regulator for slasher or beamer creels having section beams, braking devices for each section beam and a tension regulator for each braking device including a pair of levers, means for mounting the levers for movement independent of each other, each lever being connected to its braking device, and means for floating the levers on the yarn.

2. In a tension regulator for slasher or beamer creels having section beams, a pair of braking devices for each section beam and a tension regulator for each pair of braking devices including a pair of levers, means for mounting the levers for movement independent of each other, each lever having a long arm and a short arm, the short arms of the levers being connected to the braking devices and a roller shaft extending between and rotatably and tiltably connected to the long arms of the levers, said roller shaft being floated on the yarn.

3. In a tension regulator for slasher and beamer creels having section beams, a pair of braking devices for each section beam and a tension regulator for each pair of braking devices, each tension regulator including a pair of levers having long arms and short arms, a separate supporting shaft for supporting each lever for independent rotative movement, the short arms of the levers being connected to the braking devices, a roller shaft extending between and rotatably and tiltably mounted in the long arms of the levers, and a guide sleeve rotatably mounted on the supporting shafts of the levers, the yarn of each section beam being extended over the guide sleeve and under the roller shaft of its tensioning device

and being extended above the tensioning devices lying forward thereof.

4. In a tension regulator for the section beams of slasher and beamer creels having a plurality of section beams, a frame having frame members disposed above the section beams and a tension regulator for each section beam carried by the frame members disposed above the section beams, each tensioning device including a pair of brakes having braking members, adjustable anchors for said braking members, a pair of levers having long arms and short arms, a separate supporting shaft for supporting each lever for independent rotative movement, bearings carried by the frame members disposed above the section beams and rotatably receiving the supporting shafts, a roller shaft extending between and rotatably and tiltably mounted on the long arms of each pair of levers, and a guide sleeve rotatably mounted on the supporting shafts between the levers, the short arms of the levers being connected to the brake members, the yarn of each section beam being extended up over the guide sleeve and down under the roller shaft of its tensioning device and being then extended above the tensioning devices of the section beams lying forward thereof.

5. In a tension regulator for the section beams of slasher and warper creels having a plurality of section beams, a frame having frame members disposed above the section beams and a tensioning device for each section beam, the tensioning devices being mounted on the frame members disposed above the section beams, the yarn of each section beam being extended through its tension device and being then disposed above the tensioning devices lying forward thereof.

6. In a tension regulator for the section beams of slasher and beamer creels having a plurality of section beams, a frame having frame members disposed above the section beams and a tensioning device for each section beam, the tensioning devices being mounted on the frame members disposed above the section beams, the yarn of each section beam being extended through the tension device and being then disposed above the tensioning devices lying forward thereof, each tensioning device having a guide for the yarn.

WILLIAM WYLIE ARNOLD, JR.