

Sept. 11, 1928.

1,683,898

W. C. JOHNSON

TENSIONING DEVICE FOR BRAIDING MACHINES

Filed July 17, 1925

Fig. 1.

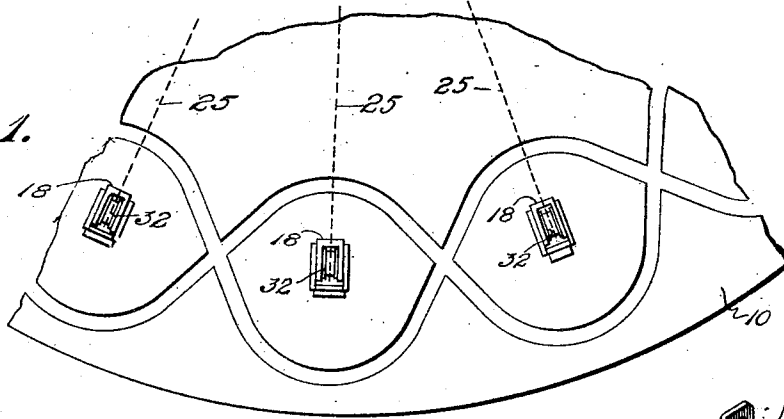


Fig. 4.

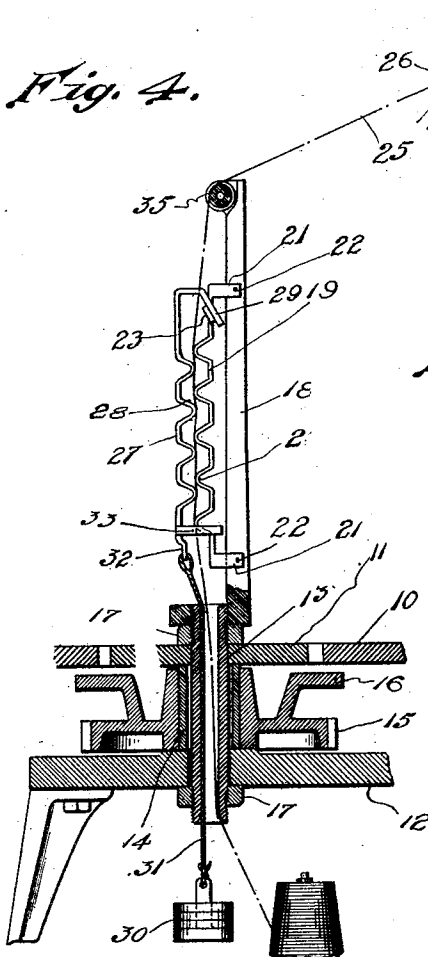


Fig. 2.

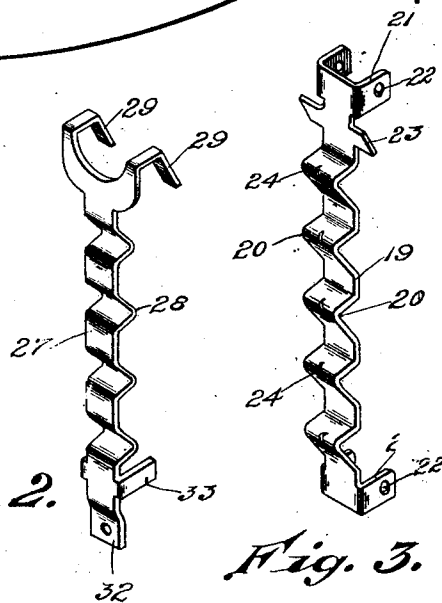
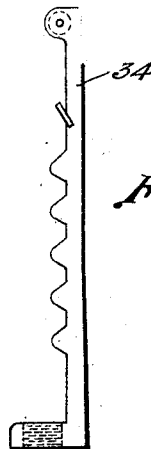


Fig. 3.

Fig. 5.



INVENTOR.
William C. Johnson
BY *Paul H. Barlow*
ATTORNEYS.

UNITED STATES PATENT OFFICE.

WILLIAM C. JOHNSON, OF PROVIDENCE, RHODE ISLAND.

TENSIONING DEVICE FOR BRAIDING MACHINES.

Application filed July 17, 1925. Serial No. 44,230.

This invention relates to an improvement in tensioning devices for the unbraided elastic warp thread of a braiding machine, and has for its object to provide such a tensioning device which is more particularly adapted to apply the desired amount of tension to an unbraided elastic warp at a point intermediate its supply and its point of braiding.

A further object of this invention is to provide an individual tensioning device for each individual warp thread, whereby the desired amount of tension may be applied to each.

A further object of the invention is the positioning of the tensioning device at a point well above the raceway plate and in as close proximity to the point of braiding as possible so as to reduce the length of the stretched portion and the loss from breakage to the minimum.

A still further object of this invention is the provision of means below the plate for regulating the amount of tension applied to the warp at a point above the plate.

The invention further consists in the provision of a set of cooperating fixed and adjustable corrugated members arranged to act upon the warp thread at a point above the raceway plate, and to provide a tension weight below this plate which is connected to the tension members through the tubular warp conducting stud.

With these and other objects in view, the invention consists of certain novel features of construction, as will be more fully described, and particularly pointed out in the appended claims.

In the accompanying drawings:

Figure 1 is a plan view of a fragmental portion of the raceway plate showing the elastic warp threads as led from the warp guide post towards the braiding center.

Figure 2 is a perspective view of the adjustable member of the tensioning device.

Figure 3 is a perspective view of the relatively fixed member of the tensioning device.

Figure 4 is a sectional side elevation showing a portion of the braiding machine with the warp tensioning device mounted thereon.

Figure 5 is a modification showing the warp tension teeth or corrugations as cast integral with the guide post.

In some instances particularly in the braiding of elastic webbing a plurality of

the elastic threads are drawn from a single supply and the tension beam which is located below the raceway plate, and these threads are then led through tubular studs in the plates to the braiding point, and that when so led often times the tension of these elastic threads is quite uniform; then again by this arrangement tension is exerted upon the threads through an extended length thereof between the beam and the braiding point, thus necessitating considerable waste by breakage of the threads; and to obviate this difficulty, I have found in the practical construction and operation of such a braiding machine, it to be of advantage to position the tensioning device at a point above the raceway plate and in as close proximity to the point of braiding as possible so as to reduce the length of the portion under tension and the loss from breakage to the minimum; second, it is found of advantage to provide such a tensioning device which is adapted to automatically grip the warp thread when it breaks and hold the broken end in position above the raceway plate to be readily engaged and again connected into the fabric at the point of braiding. It is also found of advantage to position weights below the braider plates and connect the same through the tubular warp studs to apply the proper amount of tension to the tensioning device mounted above the quoit plates, and the following is a detailed description of the present embodiment of my invention showing one means by which these results may be accomplished:—

With reference to the drawings, 10 designates the upper raceway plate, the quoits 11 of which are herein shown as being supported from the bottom plate 12 by tubular studs 13. A sleeve 14 on the stud serves as a spacer for said plates and also as a bearing for the gear 15 of the driving train, which gear also has horns 16 for driving the carrier, not shown. This tubular stud 13 is threaded at its opposite ends and is set to bind its plates in position against the ends of the sleeve 14 by nuts 17. The upper end of this tube projects above its upper nut 17 and a warp guide post 18 is mounted thereon. On this warp guide post, I have mounted a warp thread tensioning device, the fixed member of which is herein shown as formed of a sheet metal plate 19 having transverse teeth or corrugations 20, the plate being provided

with inturned fingers 21 at its upper and lower ends, which are riveted through the holes 22, to the post.

This fixed, corrugated member is provided
 5 a its upper end with a pair of laterally-
 extending inclined guide members 23 which
 are for the purpose presently described.
 The engaging edges of the teeth 20 of this
 fixed member, are preferably grooved slight-
 10 ly as at 24 to guide the warp thread 25 as
 it passes thereover and over the upper roll
 35 on its way to the center braiding point 26.
 Cooperating with this fixed corrugated
 tension plate is an adjustable tension plate
 15 27, preferably also formed of sheet stock and
 which is provided with a set of cooperating
 teeth 28 adapted to intermesh with the teeth
 20 of the fixed member for the purpose of
 engaging the warp thread between them to
 press or force it to take a zigzag course in
 passing over the edges of these teeth.

In order to cause this movable tension
 member to force the warp thread inwardly
 between the teeth, I have provided a pair of
 25 inclined hook-shaped fingers 29 near its up-
 per end, which hook over the inclined guide
 wings or members 23, and I have suspended
 a weight 30 below the bottom plate 12 of
 the machine by a cord 31 which extends up
 30 through the tubular stud 13 and is attached
 at 32 to the lower end of this movable ten-
 sion plate 27.

It will be noted that this lower end of
 the movable tension plate is offset outwardly
 35 from the line of pull through the tubular
 stud and thus the tension on the same has
 a tendency to draw the lower end of the
 plate into closer engagement with the fixed
 plate, the inclination of the hook fingers 29
 40 on the inclined member 23 also assist in
 serving to draw the upper portion of the
 corrugated members into closer engagement.
 Therefore, when a light tension is required
 on the warp 25 a comparatively light weight
 45 30 is mounted to apply the tension to the
 plate 27, thus permitting the drag of the
 warp thread to act upon the plate and lift
 its teeth somewhat out of deep engagement
 with the fixed plate, and when a greater ten-
 50 sion is required more weight is applied at
 30 which serves to effect a deeper engage-
 ment of these teeth and so accentuate the
 zigzag course of the warp thread through
 the corrugated tension members.

The upper end of this movable plate 27
 is guided laterally by the inturned guide
 fingers 29 which straddle the post and the
 lower end of this plate is also guided later-
 60 ally by the fingers 33 which straddle the
 lower end thereof.

In some instances, instead of forming the
 fixed member of the tension plates sepa-
 rately, the teeth may be formed integral with
 the post 34, as illustrated in Figure 5.

65 By this construction, it will be seen that

the tension is applied to the warp thread at
 a point above the raceway plate and in prox-
 imity to the point of braiding.

Then again, each individual thread has
 its tension, and third, the tension weights 70
 are mounted below the body of the braid-
 ing machine out of the way and in position
 where the weight members thereon, may be
 readily adjusted.

The foregoing description is directed 75
 solely towards the construction illustrated,
 but I desire it to be understood that I reserve
 the privilege of resorting to all the mechan-
 ical changes to which the device is suscep-
 tible, the invention being defined and limited 80
 only by the terms of the appended claims.

I claim:

1. In a braiding machine having a race-
 way plate with an opening therein for the
 passage of a warp thread, a fixed warp 85
 guide post adjacent said opening and ex-
 tending upward above said plate a substan-
 tial distance, a warp thread tensioning de-
 vice operatively mounted on said post com-
 prising a pair of members extending along 90
 the length of the thread to engage the same,
 and a weight located below said plate and
 having a connection extending through said
 opening for applying a tensioning action to
 said members to more or less firmly engage 95
 the thread.

2. In a braiding machine having a race-
 way plate with an opening therein for the
 passage of a warp thread, a warp guide 100
 post on said plate adjacent said opening,
 a warp tensioning device mounted on said
 post comprising a set of cooperating fixed
 and adjustable corrugated members arranged
 to act upon the warp thread, and a ten- 105
 sion weight below said plate and a cord
 extending from said weight through said
 opening to said adjustable corrugated mem-
 ber to act thereon.

3. In a braiding machine having a bottom
 plate and an upper raceway plate connected 110
 by a tubular stud through which the warp
 is led, a fixed warp guide post on said upper
 plate, cooperating adjustable warp tension-
 ing members carried by said post, and a ten- 115
 sion weight below said bottom plate con-
 nected through said stud to one of said
 tension members.

4. In a braiding machine having top and
 bottom plates, a tubular conducting warp
 stud extending through said plates, a warp 120
 post extending upward above said stud, a set
 of cooperating corrugated tension members
 mounted on said post engaging the warp
 thread, a tension cord extending from one
 of said members through said stud, and a 125
 weight on said cord below said bottom plate
 for applying tension to the warp through
 said member.

5. In a braiding machine, a tension de- 130
 vice comprising main and auxiliary mem-

bers each having cooperating interengaging corrugations, an inclined engaging support by which one of said members is suspended in proximity to its complemental member
5 tending to move one into closer engagement with the other to increase the tension on the thread passing between them.

6. In a braiding machine, a tension device comprising main and auxiliary members each having cooperating interengaging corrugations, an inclined engaging support by which one of said members is suspended in proximity to its complemental member
10 tending to move one into closer engagement with the other to increase the tension on the thread passing between them, and cooperating means further assisting to draw said
15 tension members closer together.

7. In a braiding machine, a tension device
20 having cooperating interengaging corrugations, an inclined engaging support by which

one of said members is suspended in proximity to its complemental member tending to move them into closer engagement one with the other to increase the tension on the
25 thread passing between them, and a weight exerting a pull on one of said members to further assist in drawing them closer together.

8. In a braiding machine having a top
30 plate, cooperating fixed and movable tension members mounted above said plate and having cooperating intermeshing teeth, an inclined support by which the movable member is suspended tending to draw the two
35 together, and a weight suspended below said plate and connected to said movable member to further assist in exerting a tension on the warp thread passing between said movable
40 and fixed members.

In testimony whereof I affix my signature.

WILLIAM C. JOHNSON.