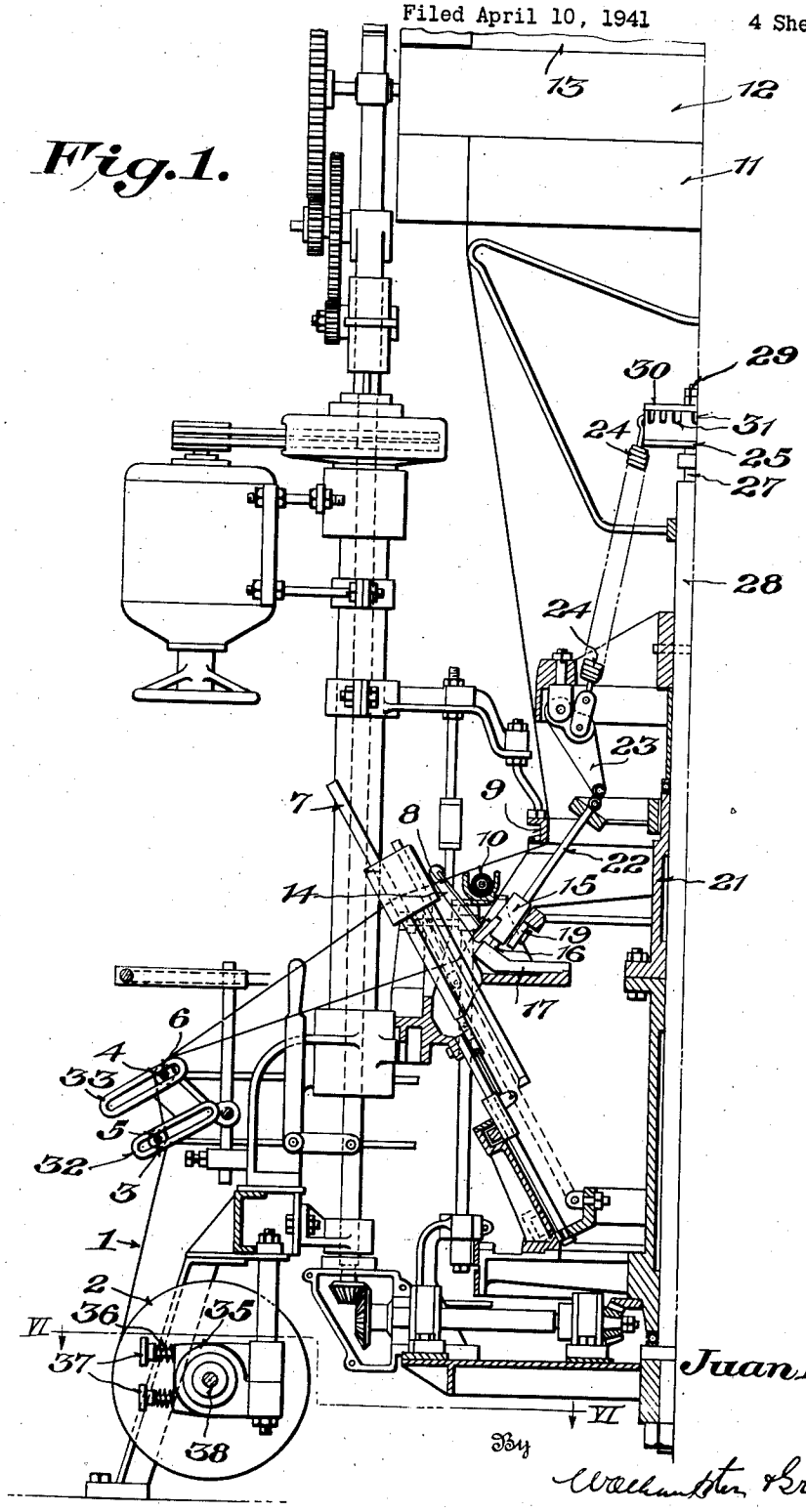
Aug. 31, 1943. J. BALSACH 2,327,987

CIRCULAR WEAVING LOOM

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Fig. 1.



Inventor

Juan Balsach,

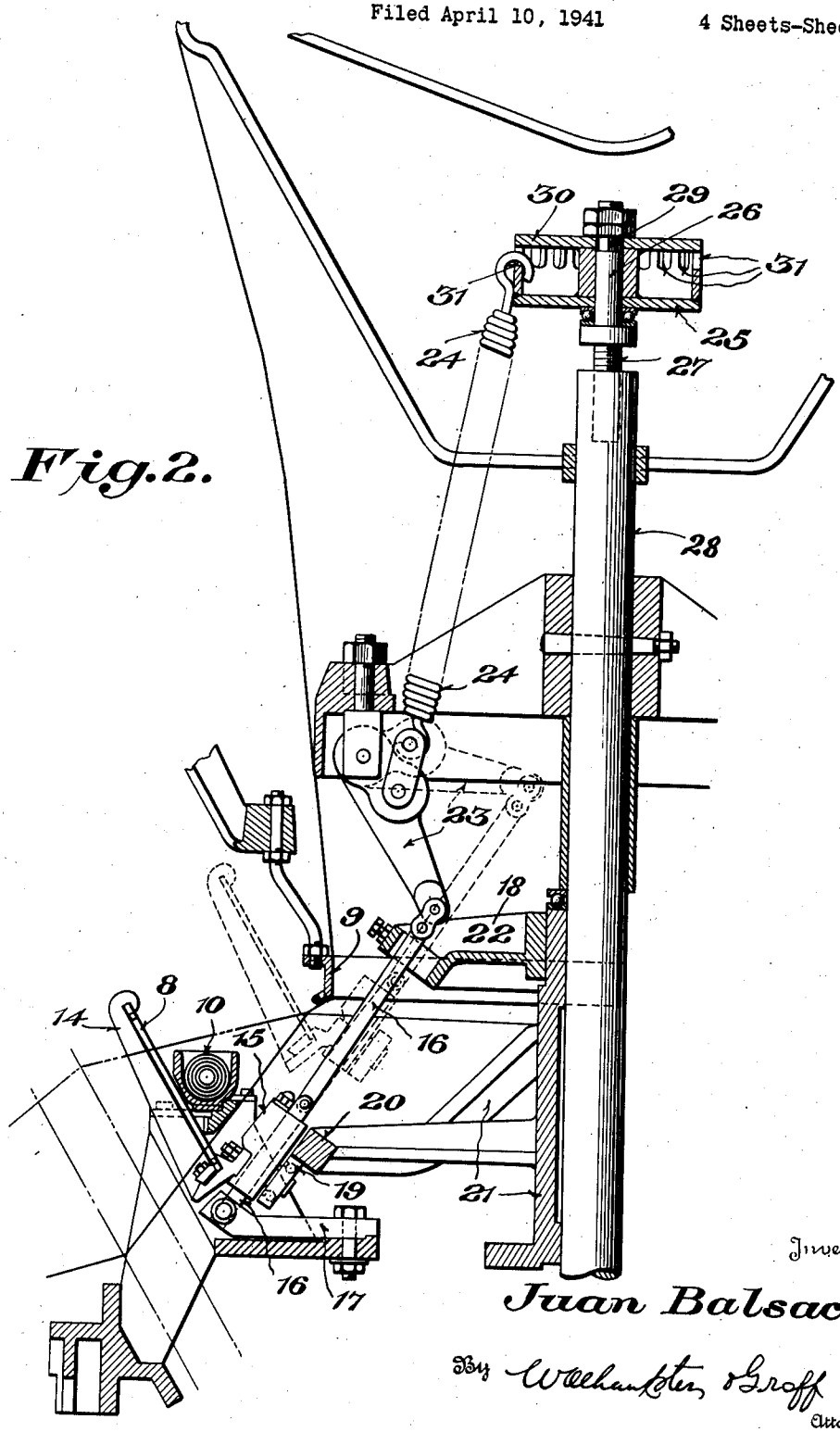
By Wilkinson & Groff Attorneys

Aug. 31, 1943. J. BALSACH 2,327,987

CIRCULAR WEAVING LOOM

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Fig. 2.



Inventor

Juan Balsach,

By Wellington & Groff

Attorneys

Aug. 31, 1943. J. BALSACH 2,327,987

CIRCULAR WEAVING LOOM

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Fig.3.

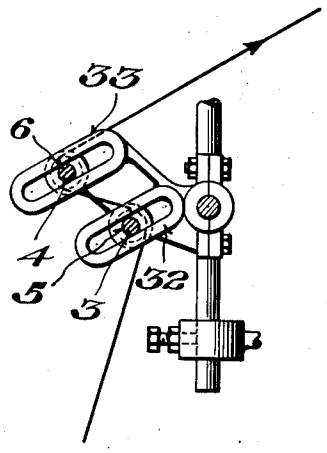


Fig.4.

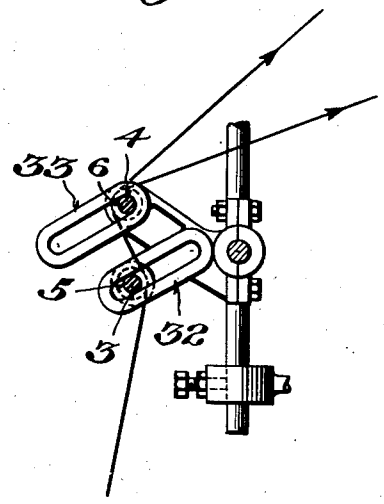
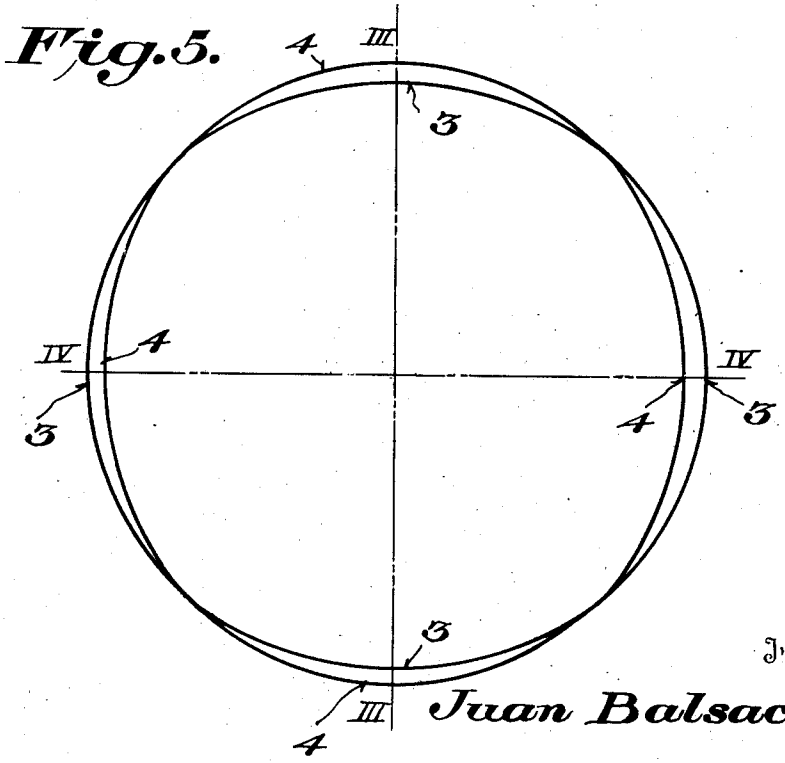


Fig.5.



Inventor

Juan Balsach,

By Wolhaupter & Groff

Attorneys

Aug. 31, 1943. J. BALSACH 2,327,987

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Fig. 7.

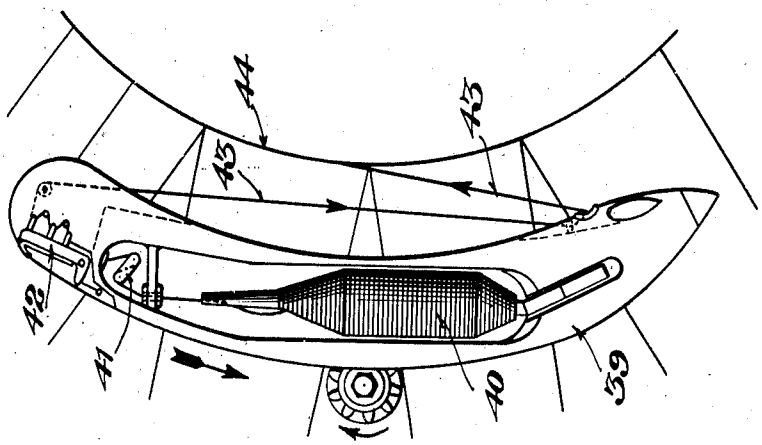
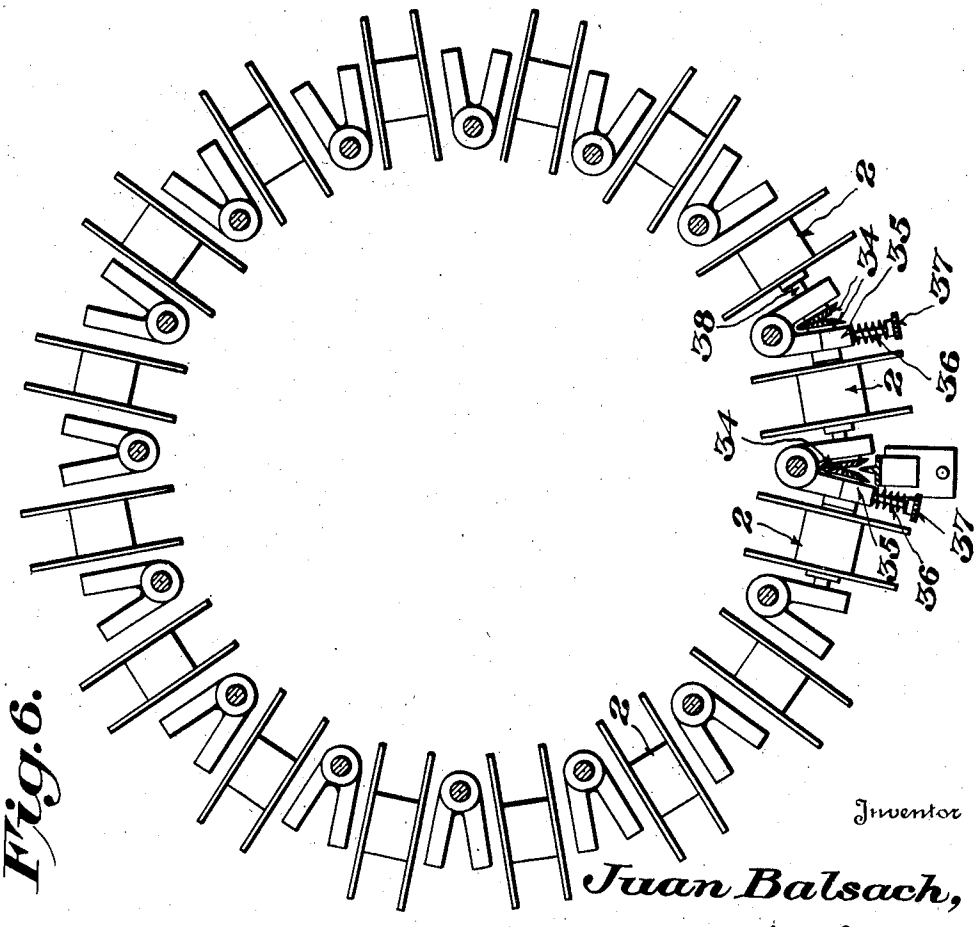


Fig. 6.



Inventor

Juan Balsach,

By Wolhaupter & Groff

Attorneys

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UNITED STATES PATENT OFFICE

2,327,987

CIRCULAR WEAVING LOOM

Juan Balsach, Buenos Aires, Argentina, assignor of one-half to Sedalana Sociedad Anónima, Buenos Aires, Argentina

Application April 10, 1941, Serial No. 387,981

2 Claims. (Cl. 139—13)

This invention relates to improvements in circular looms employing shuttles and an essential object of the same is to provide a novel and improved type of machine of this kind which owing to its convenient features of construction and operation, offers substantial advantages over the apparatus of similar types heretofore proposed and used.

The improvements which form the object of this invention and will be particularly described in the following specification, allow of performing the operation of circular looms at greatly increased speeds, up to values of speed heretofore considered impossible in the present conditions of construction of said circular looms, the arrangement of the whole according to this invention being such that only by the simultaneous use of said respective improvements, the desired increase of speed in the operation of the circular loom will be attained.

In circular looms of this description, the speed has been restricted to the limits heretofore employed, mainly by the following facts:

1. The inertia of the reed for adjusting the wefts;

2. The insufficient compensation of the tensional differences of the warp threads when forming the sheds; and

3. The rather slow action of the weft stop motion and of the stoppage of the loom at the moment of finishing the weft thread.

The first of these drawbacks occurs as a logical consequence of the systems used up to this date for operating the weft adjusting reeds. Notwithstanding the dividing of said reed into segments corresponding to small widths of warp threads and the provision of elements of small size and light weight, the inertia of the reeds and the corresponding slots or guide members constitutes a serious objection, owing to the same being formed of rigid or fixed bodies, unable to absorb the vibrations of a mechanism such as the reed which within a very short time, of fractions of a second, must perform a reciprocating motion, thereby causing jerks and vibrations which, in turn, tend to tear the threads and cause a premature wear of the elements of the mechanism.

The second of the drawbacks referred to, is a consequence of the first one, since when increasing the speed of the circular loom, after overcoming the inertia of the reeds, the warp threads will be submitted, owing to the speed of the succession of sheds, to a series of successive tensions and slacks of such frequency and speed as to create an absolute necessity of providing the loom with some tension compensating mechanism for the warp threads, adapted to act with great speed and very sensitive in its operation.

The second difficulty having thus also been overcome, it would notwithstanding be a useless task to try to increase the speed of circular looms while not increasing, to a similar or even greater degree, the speed of the weft stop motion or devising a means for assuring the passage of the weft, so as to avoid the weft end failures in the fabric, caused by such high speed at the finish of the weft thread contained in the shuttle.

The invention also has in view other objects which will more fully be understood from a consideration of the following description of the same.

In order that the invention may be readily understood and carried into practice without difficulty, a preferred embodiment of the same has been shown in the accompanying illustrative drawings, in which—

Figure 1 shows one half of a vertical section of a circular loom.

Figure 2 illustrates, drawn to a larger scale, the reed mechanism and its corresponding operation.

Figures 3, 4 and 5 show detail views of the compensating device for controlling the tension of the warp threads.

Figure 6 is a cross section of the loom, on the line VI—VI of Figure 1, and

Figure 7, finally, illustrates a shuttle and the passage of the weft by the same.

In all the said figures, similar numbers of reference have been used to indicate like or corresponding parts.

With reference to Figure 1, it will be seen that in accordance with this invention, the warp 1, contained in the warping bobbins 2, passes between the guide spools 3 and 4, mounted on resilient rings 5 and 6, and through the healds 7 and reed 8 and join adjacent to the ring 9 where they are woven with the weft of the shuttle 10, two of which are operating, as a minimum, simultaneously in the circular loom.

The fabric rises under tension, applied to the same by the rollers 11 and 12, and winds on the roller 13.

The shuttles are of the type operated by synchronized gears, distributed along their course, and their motion is, in consequence, of considerable speed.

The reed is divided into a plurality of fractions

or sections, one of which is shown at 8 in Figures 1 and 2. The reed 8 is secured by the bracket 14 to the slide 15 which slides on the rods 16, held in a fixed position by the bracket members 17 and 18. The roller 19 of the slide 15 is continually pressed against the flange 20 of the cam 21 by the action of the connecting rod 22, lever 23 and spring 24, connected to central supporting elements 25. The element 25, to which all the springs 24 are connected, is adapted to rotate freely on a stud 26, screwed at 27 on the fixed central shaft 28 of the loom. The tension of the springs 24 is adjusted to the desired degree by turning the square portion 29, formed on an extension of said stud 26, by the cap 30 which fits in the square part 29 and engages by means of a tooth provided thereon, with any of the slots 31 of the member 25.

The motion of the reed, in consequence, is caused by the action of the springs 24 which absorb all the vibrations set up by the mechanism in operation, thereby avoiding, owing to the speed or the inertia of the elements which form the mechanism, the interruption of engagement between the roller 19 and the flange 20, which constitutes the main cause of the jerks and vibrations. The fact that the tensions of the springs may be adjusted allows of using a minimum amount of stress in connection with given values of speed and weight of the reeds, as it is well known that this latter condition varies according to the greater or lesser fineness of the reed. By this arrangement, the speed of the mechanism may be greatly increased, since the same depends on the tension to which the springs have been adjusted. On the other hand, the springs are of great strength and operate with a small amount of displacement, for which purpose they are mounted adjacent to the point of pivoting of the lever 23, in order to increase their length of service.

The mechanism for compensating the tension of the warp threads, consists of guide spools, mounted on two resilient rings 3 and 4 (Figures 3 and 4), adapted to deform within the guides 32 and 33, so that when forming the sheds (Figure 4) and when increasing the tension of the threads, the ring 4 will shift in an inward direction, and the ring 3 in an outward direction with regard to the machine.

The circular loom being of the type of two shuttles which move at the ends of a diameter, the resilient rings will become flattened and take the shape of an ellipse (Figure 5), with the longer axis of one of them corresponding with the short axis of the other, and vice-versa. When closing the sheds (Figure 3), the tension of the threads will decrease and the rings, by continuing their deformation, will pass to occupy positions reciprocal to those shown in Figure 4. In consequence, the compensation of the tensions will be double in nature and will be performed by the threads themselves. From the simplicity of the arrangement and the description of its operation, its efficiency in connection with great working speeds will readily be appreciated.

The reliability of the operation, however, would be less if the sections into which the warp is divided, were not fed from bobbins similarly built, containing the same amount of warp and provided with brakes adjusted to the same degree of tension. The uniform and even winding of the threads of said bobbins does not offer, at present, any difficulty, as very perfect warping devices are now in general use; in order to avoid the drawback of having to provide a separate brake on every bobbin, said bobbins 2 are so arranged, as indicated in Figures 1 and 6, as to be connected one to another by means of angular or bevel gears, or other suitable devices 34, of positive action and supported between two bearings, one of which, 35, operates as a brake, for which purpose its cover or top is pressed against the axle, as by means of springs 36 and pressure rods 37. This arrangement offers the advantage that while all the bobbins are coupled together and each of them is provided, notwithstanding, with its corresponding brake, any unevenness occurring in said brakes will not have effect on the resulting tensions in the thread sections and thus, any twisting will be avoided which would occur if the braking action were concentrated upon one or two points.

The weft contained in the shuttle 39, Figure 7, unwinds from the cop 40, passes by the brake 41 and through the eyes of the small lever 42 which, when the weft is broken or exhausted, protrudes outside the shuttle and acts on any one of the usual control devices distributed along the course of the shuttles. Even if the device for stopping the loom were of the electromechanical type, the speed of the loom is such that if the weft is going directly to be woven, a weft failure will occur in the fabric 44. To avoid this trouble, the passage of the weft is arranged as indicated at 43, so that even if at the instant of the end of the weft thread passing by 42, the controlling device and brake should act with a certain delay on being actuated by absence of a weft thread, the length of weft thread from 42 to 44 will prevent a failure in the fabric. It should be noted that this device for the timely warning of the ending of a weft offers the advantage, over the devices of similar type already known, that all the thread is discharged from the cop and any waste of weft is thus avoided.

From the foregoing description, the nature and operation of the invention will be understood and no further explanations are deemed necessary for those skilled in the art.

Having now particularly described and ascertained the nature of my said invention and the manner in which the same is to be performed, I declare that what I claim and desire to secure by Letters Patent is:

1. In a circular loom, a central shaft, a sectional reed, individual slides for respectively mounting the sections of said reed, fixed rods upon which said slides are slidably mounted, each of said slides comprising a roller, an operating cam carried on said central shaft and comprising a projecting flange, a plurality of individual connecting means connected to said slides respectively, a stud mounted on the end of said shaft adjustable axially thereof, a circular support rotatably mounted on said stud and comprising a plurality of individual mounting means, and individual springs respectively mounted between said mounting means and said individual connecting means, said connecting means being adapted under urging of said springs respectively to press said roller against the flange of said cam, whereby reed vibrations are prevented.

2. In a circular loom, a central shaft, a sectional reed, individual slides for respectively mounting the sections of said reed, fixed rods upon which said slides are slidably mounted, each of said slides comprising a roller, a cam member carried on said central shaft, an adjustable axial carrying member carried by said shaft axially

adjustably thereof, individual springs for each of said slides respectively, individual means for connecting a first end of each of said springs to each of said slides respectively, and common mounting means rotatably carried by said axial carrying member and being adjustably displaceable axially of said shaft by adjustment of said carrying member, the second end of each of said springs being mounted on said common mounting means, whereby said adjustable carrying member may be adjusted to cause said cam member to be continuously resiliently pressed by each of said slide rollers respectively by the action of said springs.

JUAN BALSACH.