March 10, 1931. W. REINERS ET AL 1,795,506

WARP BEAMING MACHINE

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Fig. 1

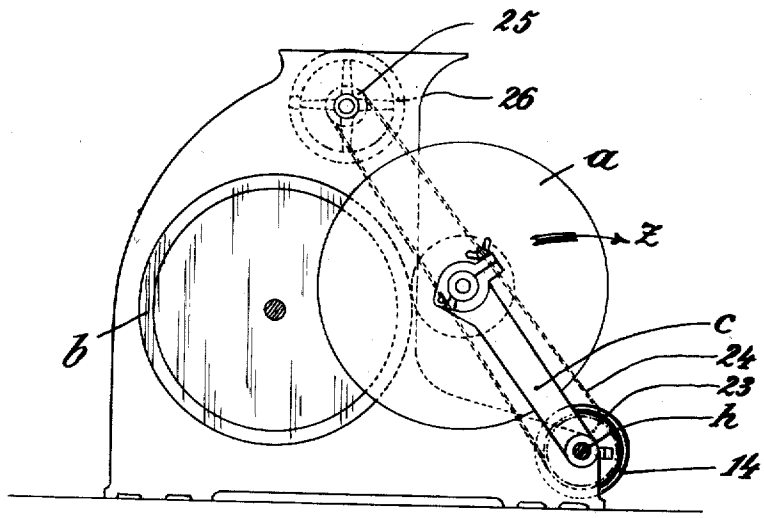
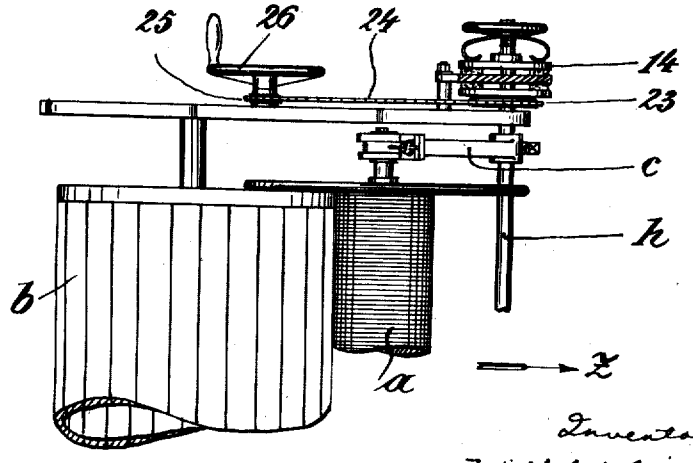


Fig. 2.



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Fig. 3.

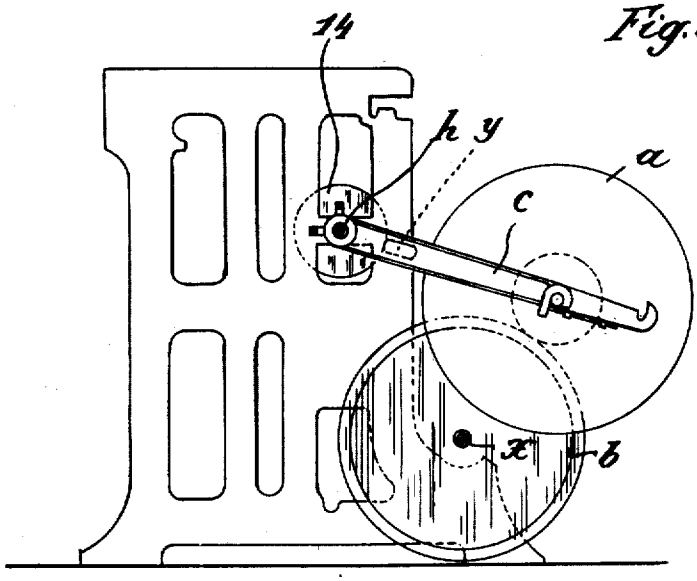
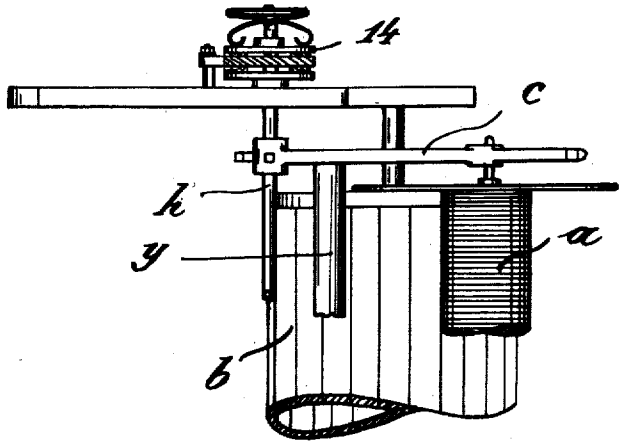


Fig. 4



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WARP BEAMING MACHINE

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Fig. 5.

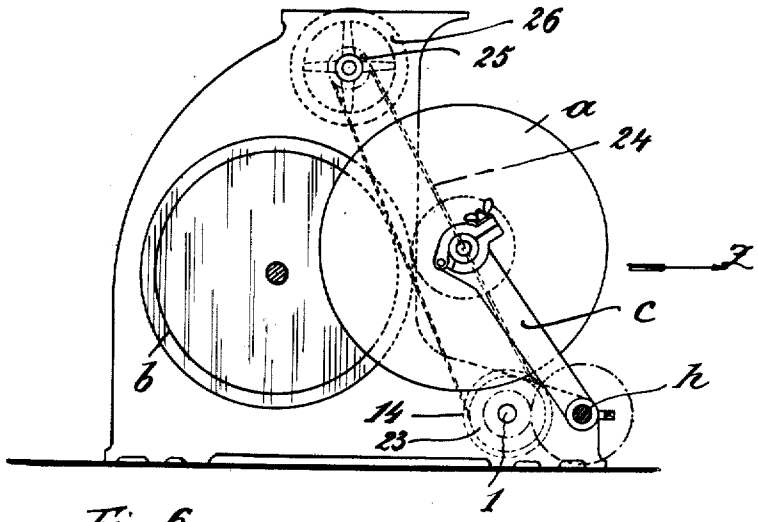
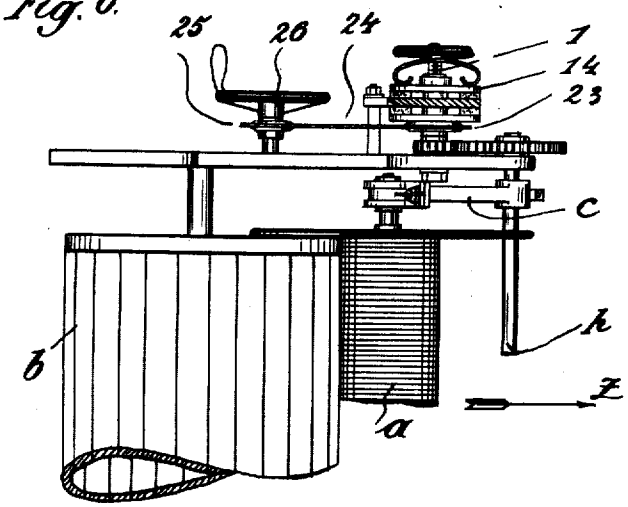


Fig. 6.



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WARP BEAMING MACHINE

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Fig. 7

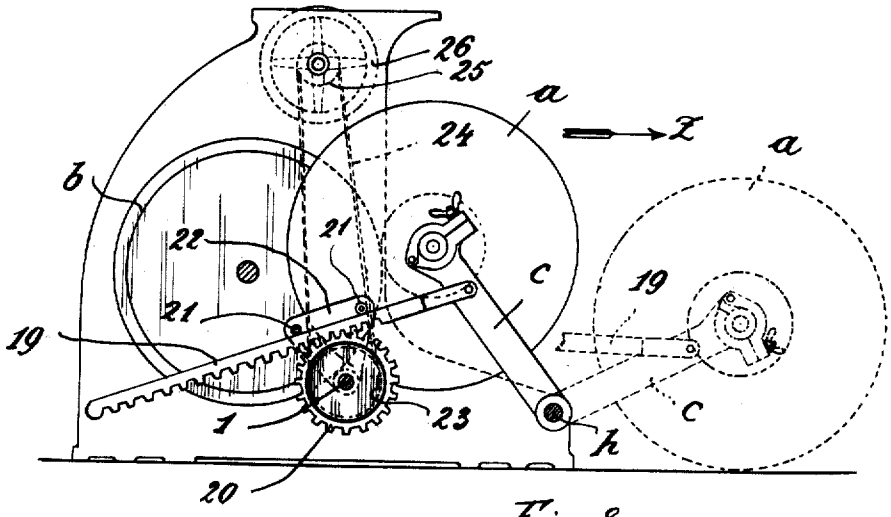
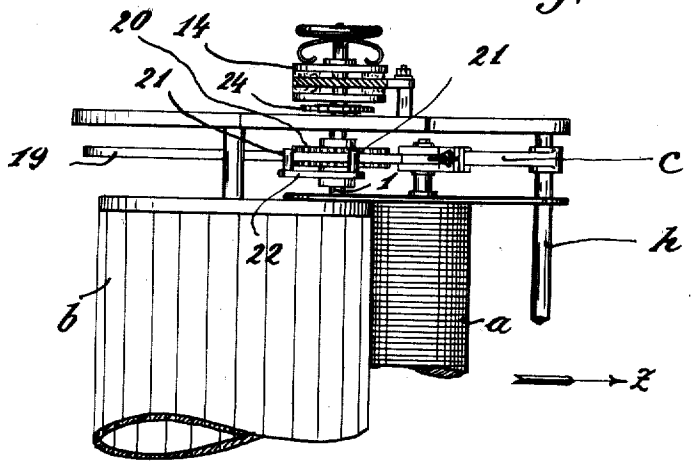


Fig. 8.



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WARP BEAMING MACHINE

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Fig. 9.

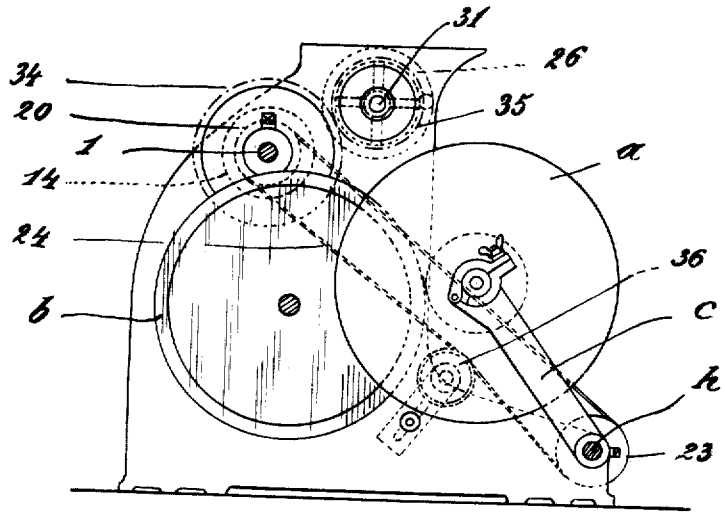
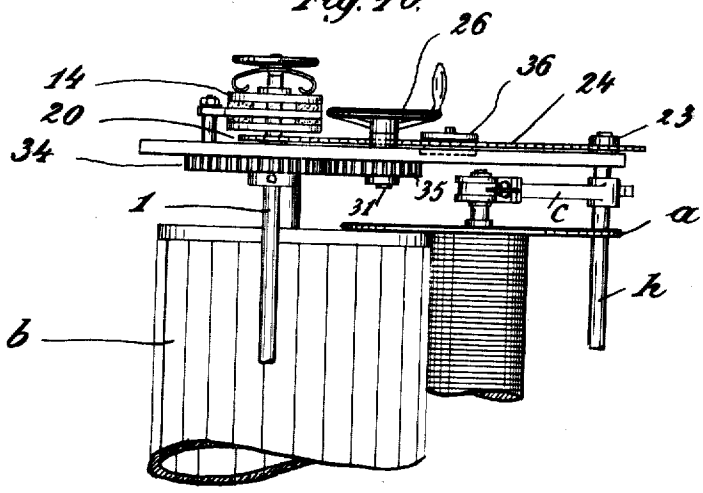


Fig. 10.



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WARP BEAMING MACHINE

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Fig. 11.

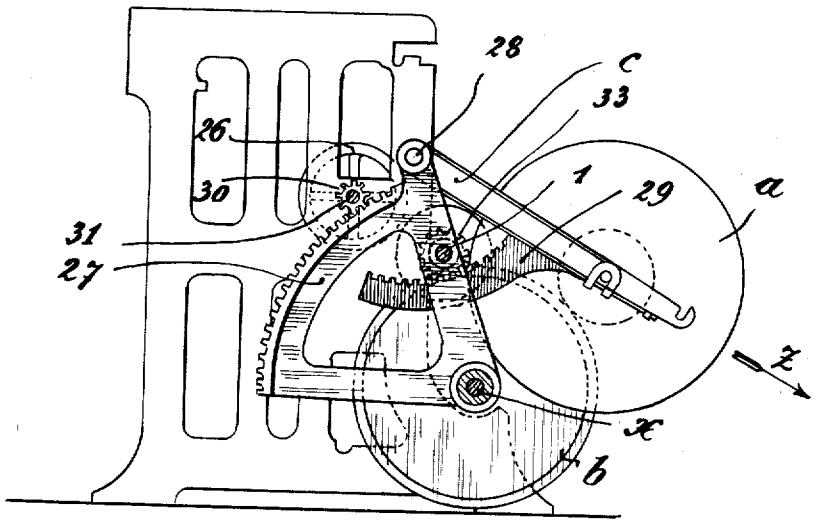
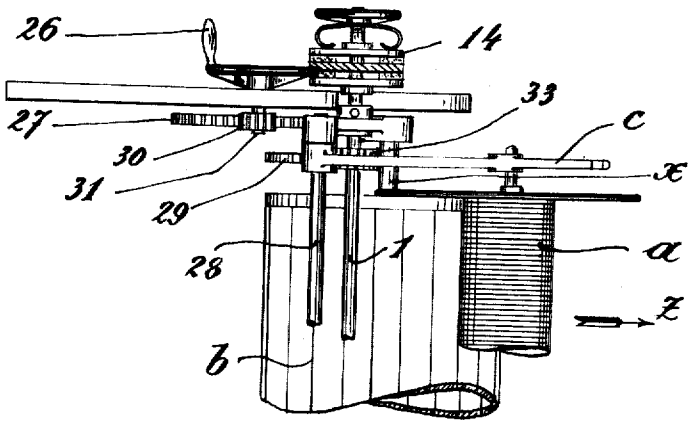


Fig. 12.



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Patented Mar. 10, 1931 1,795,506

UNITED STATES PATENT OFFICE

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WARP-BEAMING MACHINE

Application filed June 10, 1929, Serial No. 369,844, and in Germany January 28, 1929.

In warp beaming machines of the kind in which the warp beam is driven by frictional surface contact with a rotating drum, the warp beam has a tendency to make jumping movements owing to natural imperfections of beams manufactured on a commercial scale, seeing that the cost of perfect beams would be prohibitive and even then the beams would suffer in use and particularly during transport. Besides, this jumping is not only due to untrue running but also to the great surface speed of the beam. As it is a serious drawback, the problem presents itself how to prevent it.

Proposals for the avowed purpose of obtaining beam warps of equal density have been previously made, such as for instance the interconnection of the beam arms so as to form a rigid cradle, or in another case the pivoting of the beam arms somewhat below the beam in such a fashion that the active leverage is reduced as the diameter of the warp beam increases.

For cases in which the weight of the warp beam itself is not sufficient to obtain a beam of sufficient firmness, an additional contact pressure can be obtained by hanging on the beam arms dead weight arranged so as to act in the direction of the beaming drum. The application of such additional weights has the great drawbacks that the weights participate in the jumping of the untrue warp beam and that they have to be taken-off and put-on by hand when the full beam has to be exchanged against an empty one, these weights being often very heavy.

The present invention has for its object to prevent the jumping of the warp beam and also to obtain the additional and adjustable contact pressure between beaming drum and beam necessary for obtaining the desired density of the warp beam in a more efficient fashion, namely by arranging one or more smoothly acting resistances to torsional displacement on a common shaft and positively transmitting same to the two beam arms.

This resistance to torsional displacement can be obtained by means of a mechanical friction brake or by means of a liquid resistance acting either direct on the shaft carrying the two beam arms or on a secondary shaft which is connected to the shaft carrying the beam arms or to the beam arms themselves by means of wheel or chain gearing.

It is true that in one case a shaft carrying the beam arms is fitted with a disc friction brake for the purpose of obtaining an additional pressure by means of a frictional resistance, but in this known arrangement the beam arms are loosely arranged on the shaft and they engage with projections on same, such an arrangement involving the danger of the two beam arms not remaining square, which is equivalent to irregular density of the beam.

Figures 1 to 12 show various examples of such arrangements, each of said examples being shown in a side and a plan view.

In all the six examples, a is the warp beam carrying beam arms c pivoted at h, b the beaming drum, 14 the torsional resistance applied either to the shaft h or to a secondary shaft 1, the resistance being either a dead or spring weighted set of friction discs one of which is arranged in a fixed position, or a band brake, liquid resistance or a similar arrangement serving the same purpose.

In every case, the torsional resistance exerts on to the beam arms the desired additional surface pressure in the direction of the beaming drum b which in intended to prevent the jumping and to ensure a greater density of the warp beam. As the warp is wound on to the beam and the warp body of same increases in diameter, the beam and the beam arms move in the direction of the arrow z.

Figs. 1 and 2 show a way of facilitating the exchange of a full warp beam against an empty one. A sprocket wheel 23 arranged on shaft h and interconnected by chain 24 to a sprocket 25 pivoted on the framing and arranged to be easily turned by hand say by a hand wheel 26 or similar means, permits of easily shifting the beams arms c with the full warp beam quite to the right, to free the warp beam of the beam arms, to take out the full warp beam and to put in an empty one.

In the example as per Figs. 3 and 4 the

beam arms *c* are in an approximately horizontal position and the torsional resistance is placed on the shaft *h* carrying the beam arms *c* similar as in Figs. 1 and 2. Also in this case the shaft *h* and the beam arms *c* must form a rigid cradle, for which purpose the two beam arms may be provided with a cross piece *y*.

In this case, the application of an arrangement as that shown in Figures 11 and 12 would allow an easy exchange of the warp beams, the shaft *h* being carried in two arms pivoted on the beaming drum shaft *x*, one of which arms is developed as a toothed segment.

The arrangement shown in Figs. 5 and 6 is different from Figs. 1 and 3 in that the torsional resistance 14 is arranged on a shaft 1 in proximity to the shaft *h*, the shaft 1 being connected to the shaft *h* by gearing. Also in this case, the chain sprocket 23 is arranged on shaft 1.

The example represented in Figs. 7 and 8 shows shaft 1 at a greater distance from shaft *h*, a positive connection between it and the beam arm *c* being obtained by a pair of wheels 20 and corresponding toothed racks 19, one each for each beam arm, the toothed racks 19 engaging with the rack wheels 20. To ensure that the racks properly engage with the rack wheels, each rack is held in position by a device 22 pivoted on shaft 1 and fitted with guide rollers 21. Thus the torsional resistance is transmitted on to the two beam arms *c* by means of the rack gear 19—20, turning of the hand wheel 26 being transmitted over the chain gear 25, 24, 23, and the rack gear 19—20.

The example shown in Figures 9 and 10 represents the shaft 1 still further distant from the shaft *h*, so that the racks shown in Figs. 7 and 8 cannot well be applied, seeing that same would then project beyond the framing of the machine and be in the way. Furthermore, the force would be applied to the beam arms *c* in an unfavourable direction. Therefore, in this case the positive connection between shaft 1 and beam arms *c* is obtained again by the rigid interconnection of the beam arms *c* and their shaft *h* to a rigid beam cradle.

Shaft *h* carries the sprocket 23 which transmits its movement by means of a chain 24 on to sprocket 20 and on to the shaft 1 on which the latter is fixed. In order to prevent slack of the chain gearing during the to-and-fro movements of the warp beam, a pulley 36 can be provided, the position of which is adjustable say by a slot in the bracket carrying its pivot. The shaft 1 carries also the friction brake 14 which acts exactly as in the preceding examples. The torsional resistance is therefore here transmitted to the two beam arms *c* by the chain gear 20, 24 and 23 and the movement of the hand wheel 26 is transmitted through the gears 35/34 in addition to the afore-mentioned chain-gearing.

In the example as per Figs. 11 and 12, the beam arms are arranged in an approximately horizontal position, as in Figs. 3 and 4, but they are pivoted at points 28 of a pair of segments 27 which pivot on shaft *x* of the beaming drum *b*. Also the shaft 1 for the torsional resistance is carried on these segments 27. The surface pressure generated by the torsional resistance 14 is transmitted to the two beam arms *c* by means of the segments 29 on each beam arm, the segments having for their axis the pivot 28 and each of them engages with a gear wheel 33 on the shaft 1 for the torsional resistance. Thus, the torsional resistance is also here positively and evenly transmitted on to both beam arms. In order to render it also possible in this case, to easily exchange the full beam against an empty one, the two segments 27 are made to engage with wheels 30 on a shaft 31 having a hand wheel 26, so that turning of the shaft 31 results in the displacement of the warp beam in the direction of the arrow *z*.

Having now particularly described and ascertained the nature of the invention and in what manner same is to be performed, the claims are:—

1. In a warp beaming machine in which the beam is driven by frictional surface contact, a frame, a warp beam, beam arms carrying said warp beams, said beam arms being pivotally mounted on said frame, means for introducing a resistance to sudden movements of said beam arms comprising a friction brake and connections between said friction brake and both of said beam arms.

2. In a warp beaming machine in which the beam is driven by frictional surface contact, a frame, a shaft journaled on said frame, two beam arms rigidly connected at one end to said shaft, said beam arms carrying a warp beam at the other end, torsional resistance means, said torsional resistance means being connected to said shaft.

3. In a warp beaming machine in which the beam is driven by frictional surface contact, a frame, a warp beam, a shaft journaled on said frame, beam arms fast to said shaft, said warp beam being carried by said beam arms, a second shaft, torsional resistance means mounted on said second shaft, said second shaft being geared to said first named shaft.

4. A machine as specified in claim 10, including a second gear connected to said second shaft, means for moving said gear whereby said warp beam may be moved to a reloading position.

5. In a warp beaming machine in which the beam is driven by frictional surface contact, a frame, a shaft in said frame, arms pivoted on said shaft, two shafts carried by said arms, beam arms carried by one of said last

named shafts, a beam carried by said beam arms, a torsional resistance member on the other of said two shafts, said latter shaft being connected to the other of said two shafts, and means for moving said arms for moving said beam to a reloading position.

The foregoing specification signed at Cologne, Germany, this 24th day of May, 1929.

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CERTIFICATE OF CORRECTION.

Patent No. 1,795,506. Granted March 10, 1931, to

WILHELM REINERS ET AL.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 2, line 121, claim 4, for "10" read 3; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 14th day of April, A. D. 1931.

M. J. Moore,
Acting Commissioner of Patents.

(Seal)

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