July 21, 1936. C. B. JOHNSON 2,048,390

WARP SIZING MACHINE

Filed April 29, 1935 2 Sheets-Sheet 1

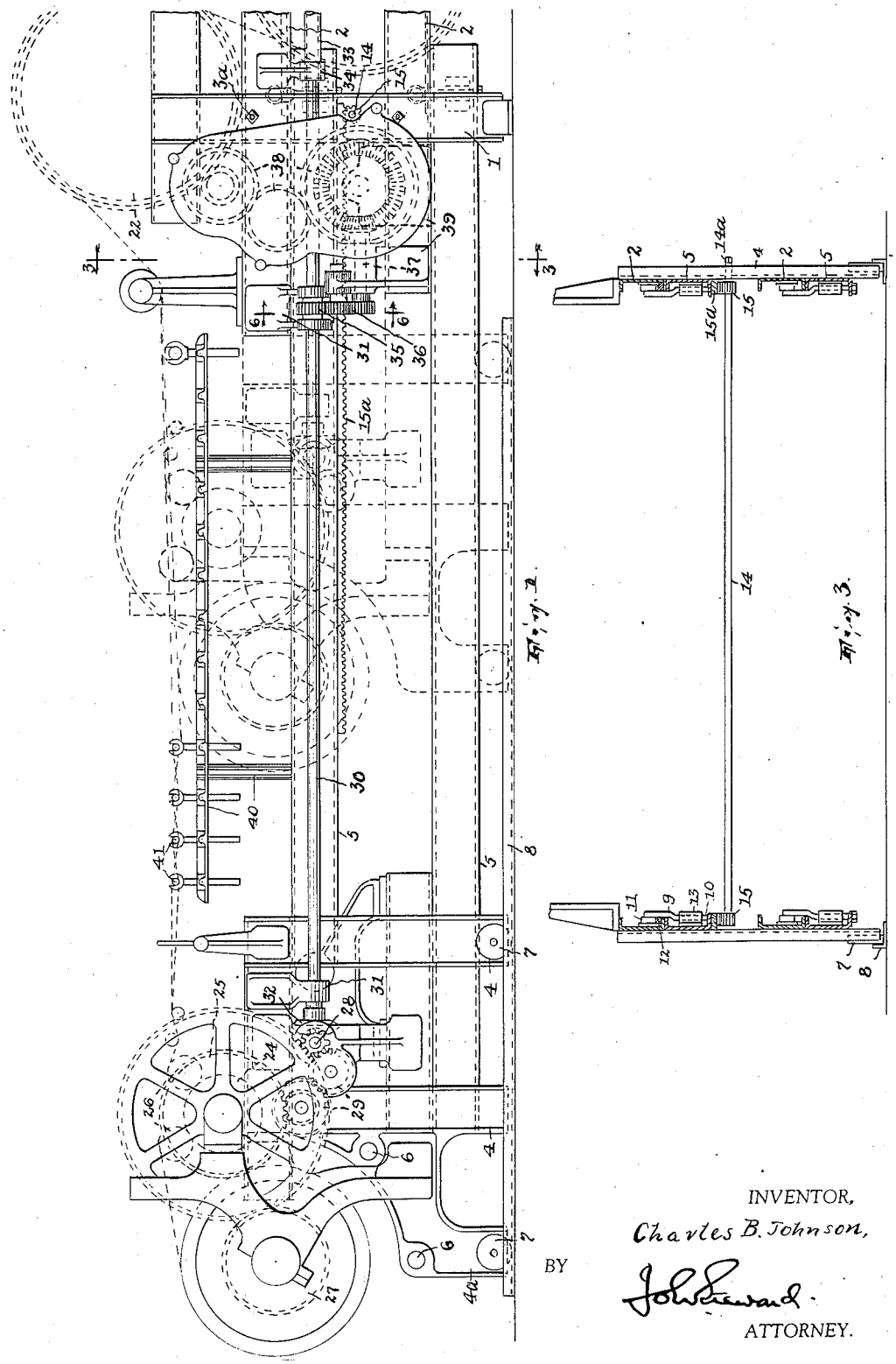


Fig. 2.



Fig. 3.

INVENTOR,
Charles B. Johnson,
BY
John Stewart.
ATTORNEY.

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WARP SIZING MACHINE

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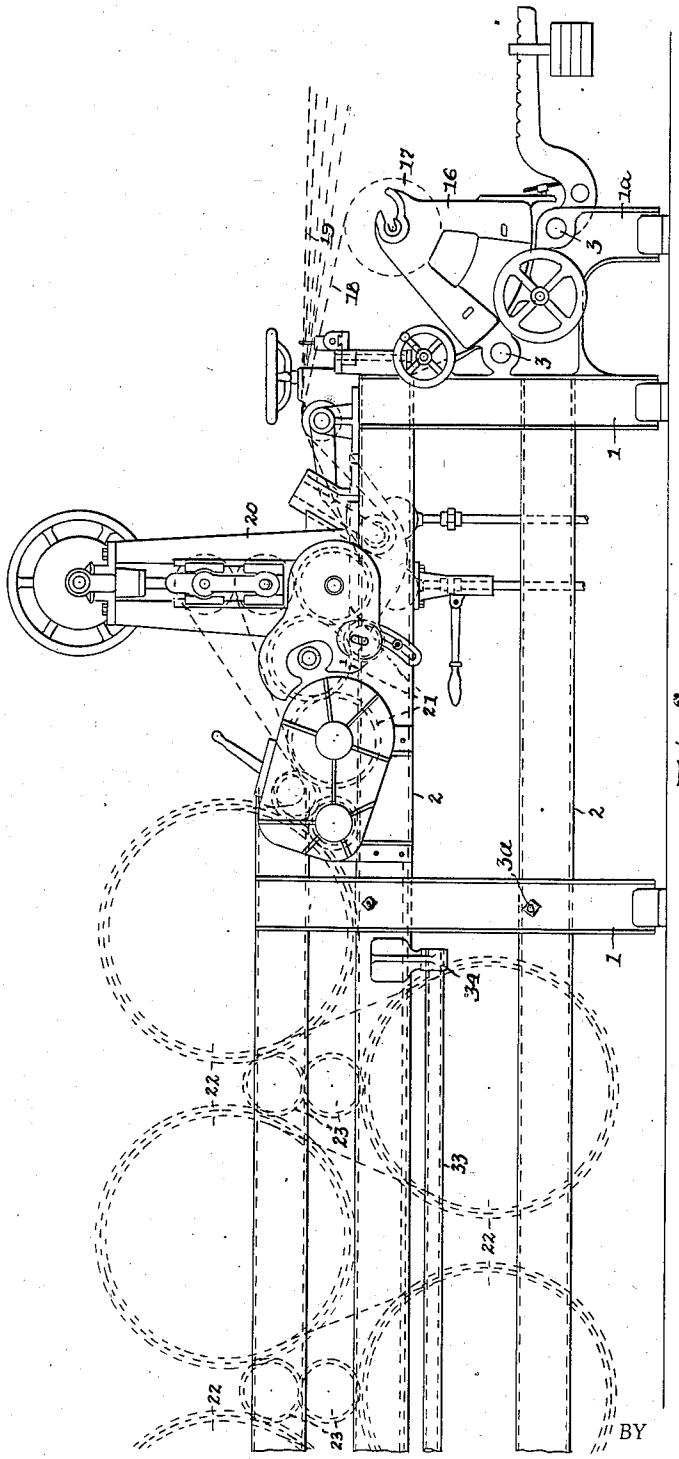


Fig. 2.

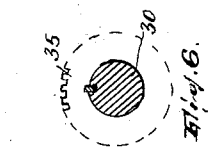


Fig. 6.

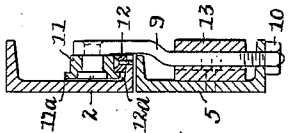


Fig. 5.

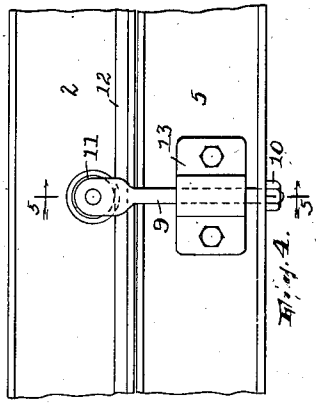


Fig. 4.

INVENTOR,
Charles B. Johnson,
BY
John Lenard.
ATTORNEY.

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# UNITED STATES PATENT OFFICE

2,048,390

## WARP SIZING MACHINE

Charles B. Johnson, Paterson, N. J.

Application April 29, 1935, Serial No. 18,886

10 Claims. (Cl. 28—28)

This invention relates to warp sizing machines. These machines include, usually with a so-called "quetch" or size-applying means, a size-drying means past which the warp travels after having the size applied and means to take up and wind the warp, as a take-up including a beam on which the warp is wound. Warps are sized according to two systems, one the so called "cotton" system in which the warp comes to the sizing operation from a beam or a number of beams and not having any lease-forming means, as cords, incorporated therewith, and the other the so called "silk" system in which the warp comes to the operation wound on a beam and having lease forming means incorporated therewith, as cords. The sizing machine used in the cotton system of warping usually has the take-up means arranged sufficiently far from the size-drying means to permit a number of "split rods" to be accommodated, the warp being decussated with respect to such rods, which act to keep the threads from rolling over each other and hence separated and in their proper order. In the sizing machine used in the silk system of warping, however, these split rods are omitted (since the warp is leased) and in order to prevent the warp from unduly sagging between the size-drying means and the take up the latter two are placed in closer proximity to each other than in the machine used according to the cotton system of sizing. Hence a plant having occasion to size warps according to either system has been heretofore required to have both of the indicated types of machines.

One principal object of this invention, therefore, is to provide a warp-sizing machine which will be convertible so that it may be used in the sizing of warps according to either of the mentioned systems.

In these machines there is desirably a gearing together of the drum or drums usually constituting the drying means and the take up, and also usually the quetch, and this I have taken into account in constructing the machine so that it may be convertible as indicated. I have also provided for the facile conversion of the machine and for affording stable support to its working parts whether it is used for sizing warps according to either system, i. e., extended or collapsed.

In these machines the take-up occupies relatively little longitudinal extent compared with the size-drying means, usually consisting as noted of a series of rotary drums or cans. In carrying out my invention the frame is made to comprise two sections, one (of the lesser longitudinal extent) carrying the take-up and the other the size-drying means, and the former is movable toward and from the latter. When the machine is used according to the cotton system support must be afforded between the size-drying means and take-up for the split-rod equipment; further, where one section is movable toward and from the other it should be guided for movement only lengthwise of the machine and against angular displacement, as by tilting. Hence I provide one section with a horizontal extension projecting lengthwise of the frame and supported by having a sliding engagement with the other section; but, in order that when the machine is collapsed such extension should not unduly project lengthwise of the machine, I apply this extension to the movable or shorter frame section.

In these machines it is usually found essential to connect the (rotary) take-up and (rotary) drums or cans by a rotary system including a rotary longitudinal shaft so that they will rotate in unison, with the object of preserving the warp always taut between the take-up and drums. To permit collapse and extension of the machine in view of the presence of such shaft and avoid the shaft unduly projecting when the machine is collapsed I journal the shaft in the movable section and provide in a suitable bearing on the other section a transmission member to which the shaft is splined. The presence of such a shaft and member indicates a further reason for providing for guiding the movable section lengthwise of the machine and against angular displacement.

In the drawings,

Fig. 1 is a side elevation of that half of the improved machine which includes the take-up means;

Fig. 2 is a similar view of the other half;

Fig. 3 is a section on line 3—3, Fig. 1;

Fig. 4 is an inside elevation of rails 2 and 5 and the coupling connecting them;

Fig. 5 is a section on line 5—5, Fig. 4;

Fig. 6 is a section on line 6—6, Fig. 1, showing only the parts 30 and 35.

The frame of the machine as shown comprises two frame structures or sections one of which is stationary and the longer and the other movable toward and from the first section and having projecting horizontal rails which are guided by the first section.

As for the first or longer section, Figs. 1 and 2 show three standards 1 rigidly connected by a

pair of horizontal upper and lower rails 2; at the far side of the machine and opopsed to these standards and rails are, respectively, similar standards and rails rigidly connected together. Each right-hand standard may have an extension 1a. The two sides or framings thus formed, each by standards and rails, may be rigidly connected in any way, as in part by bars 3 and otherwise as at 3a. As for the movable or shorter section, 4 designates standards rigidly connected by a pair of upper and lower horizontal rails 5; at the far side (Fig. 3) opposed to these standards and rails are, respectively, similar standards and rails rigidly connected together. Each left-hand standard 4 may have an extension 4a. The two sides or framings thus formed, each by standards 4 and rails 5, may be rigidly connected in any way, as in part by bars 6. Whereas the stationary section rests directly on the floor, the movable section is equipped with rollers 7 which rest on tracks 8 extending longitudinally of the machine. The rails of the movable section project therefrom and lap those of the stationary section and their projecting portions near their free ends are supported on the stationary section as follows:

The rails of both sections are of channeled form, with the channels facing inward. In the present instance the rails 5 underlap the rails 2. Near its free end each rail 5 has a bar 9 (Figs. 4 and 5) passed through a hole in its lower flange, the protruding lower end of the bar being threaded and equipped with a nut 10. The upper end portion of the bar is bent inward to clear the adjoining flanges of such rail 5 and the corresponding rail 2 and is equipped with a roller 11 which rides on a track 12 seated upon the affixed to the flange of rail 2, the track preferably having at its outer side a groove 12a in which a peripheral flange 11a of the roller extends. To maintain the coupling or stirrup formed by the parts 1—10—11 against tilting in any direction, or in rigid relation to rail 5, there may be bolted to such rail a block 13 having a hole through which the bar extends and snugly fits.

Whereas the part of the movable frame section which is formed by the projecting portions of its rails and constitutes a horizontal rigid extension thereof might be confined against lateral (horizontal) displacement by fitting closely between the standards 1 of the stationary section, in the present example the connections last described perform this function and also the important one of supporting such extension of the movable section against the action of gravity active on such portions and tending to tilt said movable section, especially since its base (from one pair of rollers 7 to the other) is relatively short.

In order to shift the movable section relatively to the stationary section one section, as here the stationary section, has journaled therein a rotary shaft 14 which may have a squared end 14a (Fig. 3) to receive a crank for manually turning the shaft, said shaft having pinions 15, and the other section may have the under sides of a near and corresponding far rail, as 5, equipped with racks 15a engaged with the pinions. When shaft 14 is turned one way or the other the movable section may be moved from the position shown by solid lines to that shown by dotted lines (in which the machine will be collapsed as when it is used for sizing warps according to the silk system) or vice versa.

The machine is equipped with the usual instrumentalities by which the warp (of either kind indicated) is treated and handled, as here a quetch as well as the rotary suitably heated drums or cans or equivalent size-drying means and a take up. These are all of conventional or at least known character (see, for instance, my Patents Nos. 1,540,265 and 1,966,097). There is also provided means 16, carried by extensions 1a, to receive the beam 17 for a warp to be sized according to the silk system, the dotted line 18 designating such warp and those 19 warps to be sized according to the cotton system. The rolls of the quetch 20 are, as usual, geared through gearing 21 with the drums or cans 22, intergeared at 23. The take-up here comprises the roll 24 having a gear 25 and around which roll and between it and nip-rolls 26 the warp extends, and the warp-receiving beam 27 driven through slip-friction from the rotary element formed by said roll and gear, all substantially as in my said Patent No. 1,966,097. 28 is the main drive shaft with which the gear 25 is inter-geared by the gearing 29 and from which the train including the drums and quetch rolls is driven as follows through means which, like the frame of the machine, is collapsible:

A shaft 30, extending longitudinally or parallel with the rails, is journaled in brackets 31 of the movable section and is geared at one end, as at 32, with the drive shaft, being confined against endwise displacement relatively to the movable section by having its gear (forming part of the gearing 32) fixed to such shaft and interposed between the other gear of such gearing 32 and the near bracket 31. At its other end said shaft is telescoped into a supporting sleeve 33 which is fixed to the stationary section in brackets 34 thereof. The right-hand bracket 31 is formed with two arms between which is a gear 35 splined to shaft 30. Through gearing 36 gear 35 drives a shaft 37 which through gearing 38 drives the series of drums. The gearing 36—38 and shaft 37 are journaled in supports 39 carried by the stationary frame section.

Thus, whether the machine is extended or collapsed, when the drive shaft is driven the drums and take-up, and here also the quetch, are driven; and in the collapsed as well as in the extended state of the machine the end of shaft 30 at the far side of the member 35 relatively to the movable section is supported against sagging and from possible binding in the bracket 31 which adjoins such free end.

At 40 is shown a rack carried by the supports formed by the upper rails 5 and which carries split rods 41 for use when the sizing is according to the cotton system, being removable when a silk warp is being treated.

Having thus fully described my invention what I claim is:

1. In combination, a warp-sizing machine frame comprising two frame sections arranged in horizontally offset relation to each other and one being movable toward and from and being of less horizontal extent than the other, and a take-up and a size-drying means the former of which is carried by the former and the latter of which is carried by the latter of such sections, each section including horizontal rails at opposite sides thereof and extending lengthwise of the frame and the rails of the movable section lapping and being confined in lapping relation to the rails of the other section.

2. In combination, a warp-sizing machine frame comprising two frame sections arranged in horizontally offset relation to each other and one being movable toward and from and being of less horizontal extent than the other, and a take-up and a size-drying means the former of which is carried by the former and the latter of which is carried by the latter of such sections, each section including horizontal rails at opposite sides thereof and extending lengthwise of the frame and the rails of the movable section underlapping the rails of the other section and the rails of said other section having stirrups supporting the rails of the movable section.

3. In combination, a warp-sizing machine frame comprising two frame sections arranged in horizontally offset relation to each other and one being movable toward and from and being of less horizontal extent than the other, a rotary take-up and a rotary size applying means the former of which is journaled in the former and the other of which is journaled in the latter of said sections, and a rotary system connecting said means and take-up for rotation in unison including a rotary transmission shaft journaled in the movable section and a rotary transmission member arranged in the other section, said shaft and member having a splined connection with each other.

4. In combination, a warp-sizing machine frame comprising two frame sections arranged in horizontally offset relation to each other and one being movable toward and from and being of less horizontal extent than the other, a rotary take-up and a rotary size applying means the former of which is journaled in the former and the other of which is journaled in the latter of said sections, and a rotary system connecting said means and take-up for rotation in unison including a rotary transmission shaft journaled in the movable section and a rotary transmission member arranged in the other section, said shaft and member having a splined connection with each other and the movable section having a horizontal extension projecting lengthwise of the frame and slidably engaged with the other section and confined thereby against angular displacement.

5. In combination, a warp-sizing machine frame comprising two frame sections arranged in horizontally offset relation to each other and one being movable toward and from and being of less horizontal extent than the other, a take-up and a size-drying means the former of which is carried by the former and the latter of which is carried by the latter of such sections, the movable section having a horizontal rigid extension projecting lengthwise of the frame and supported by and having a sliding engagement with the other section and rotary means, journaled in one section and geared with the other section, for moving the movable section.

6. In combination, a warp-sizing machine frame comprising two frame sections arranged in horizontally offset relation to each other and one being movable toward and from and being of less horizontal extent than the other, a rotary take-up and a rotary size applying means the former of which is journaled in the former and the other of which is journaled in the latter of said sections, a rotary system connecting said means and take-up for rotation in unison including a rotary transmission shaft journaled in the movable section and a rotary transmission member arranged in the other section, said shaft and member having a splined connection with each other and means on said other section at the far side of said member relatively to the movable section to support the shaft when the movable section is moved toward the other section.

7. In combination, a warp-sizing machine frame comprising two frame sections arranged in horizontal offset relation to each other and one being movable toward and from and being of less horizontal extent than the other, and a take-up and a size-drying means the former of which is carried by the former and the latter of which is carried by the latter of such sections, the movable section having a horizontal rigid extension projecting lengthwise of the frame and supported by and having a sliding engagement with the other section.

8. In combination, a warp-sizing machine frame comprising two frame sections arranged in horizontal offset relation to each other and one being movable toward and from and being of less horizontal extent than the other, a take-up and a size-drying means the former of which is carried by the former and the latter of which is carried by the latter of such sections, and rotary means, journaled in one section and geared with the other section, for moving the movable section.

9. In combination, with a take-up for a warp and means to apply size to the warp, fixed supporting means for the size-applying means, and supporting means for the take-up movable in the direction to decrease the space between the take-up and size applying means and also in the opposite direction and including a substantially horizontal extension projecting in the first direction and having a sliding engagement with the fixed supporting means and confined thereby against angular displacement.

10. In combination, with a rotary take-up for a warp and means to apply size to the warp, fixed supporting means for the size-applying means, supporting means for the take-up movable in the direction to decrease the space between the take-up and size applying means and also in the opposite direction and including a substantially horizontal extension projecting in the first direction and having a sliding engagement with the fixed supporting means and confined thereby against angular displacement and a rotary system connecting said size-applying means and take-up for rotation in unison including a rotary transmission shaft journaled in the first-named supporting means and a rotary transmission member arranged in the fixed supporting means and having a splined connection with the shaft.

CHARLES B. JOHNSON.