April 15, 1952 A. MOESSINGER 2,592,820

HARNESS CONTROL

Filed Dec. 11, 1946 2 SHEETS—SHEET 1

Fig. 1.

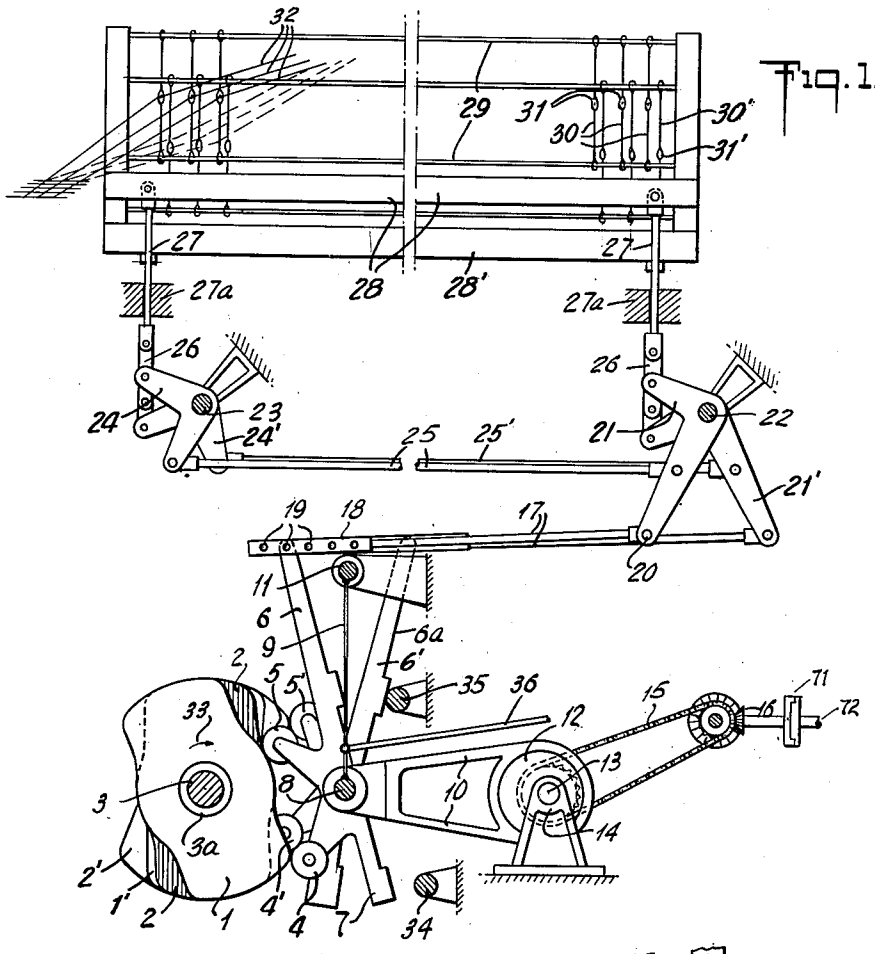
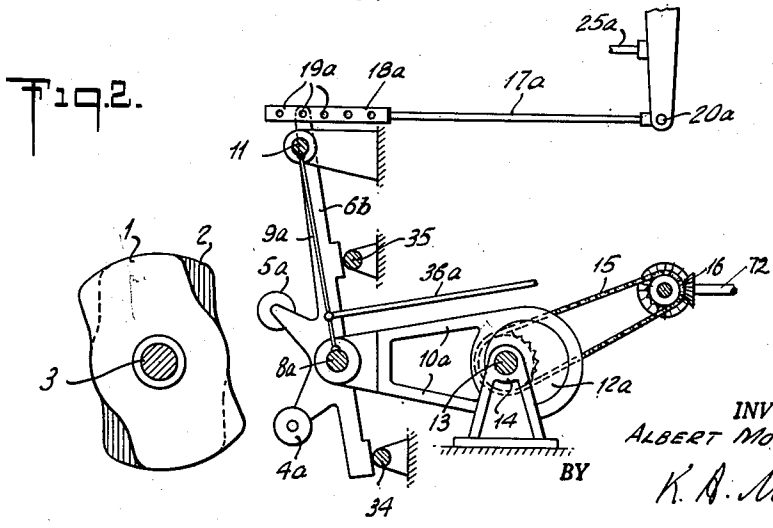


Fig. 2.



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Fig. 3.

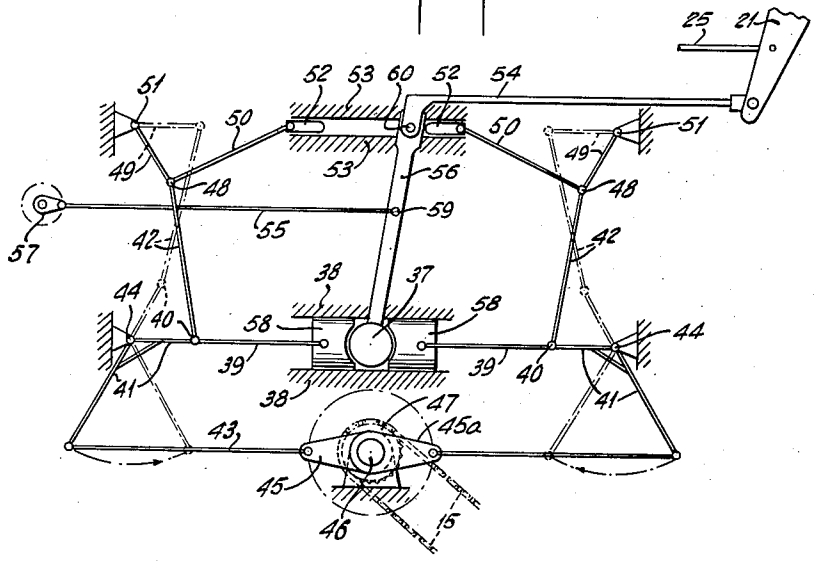
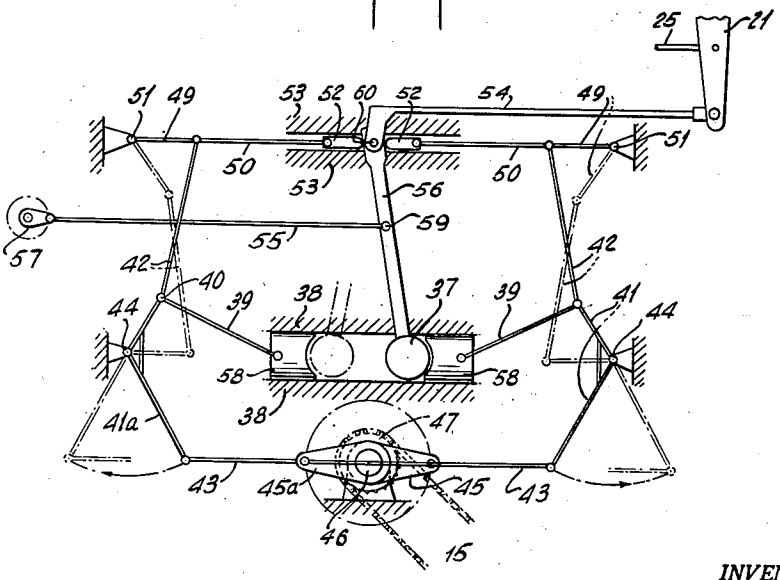


Fig. 4.



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HARNESS CONTROL

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16 Claims. (Cl. 139—56)

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The present invention relates to a loom for weaving and has for its object the provision of a harness operating mechanism which is positively driven with the loom during normal weaving and which includes control means which permit operation of said mechanism independently of the other parts of the loom, for example for producing a predetermined rest position of the harness when the loom is at rest.

It is an object of the present invention to provide means for closing and reopening the shed, in a simple manner, out of any operating position of the harness, whereby standstill periods due to failures, as for instance caused by thread breaks, are reduced.

Further and other objects of the present invention will be hereinafter set forth in the accompanying specification and claims and shown in the drawings which, by way of illustration, show what I now consider to be preferred embodiments of my invention.

In the drawings:

Fig. 1 is a diagrammatic showing of the harness operating mechanism according to the invention in an operating position;

Fig. 2 illustrates the mechanism shown in Fig. 1 in a position where the heddles are at rest;

Fig. 3 diagrammatically shows a modified harness operating mechanism according to the invention, in an operating position;

Fig. 4 illustrates the device shown in Fig. 3 in a position where the heddles are at rest.

In the modification shown in Fig. 1, the harness operating mechanism comprises motion initiating means having cams 1 and 2, which act as driving members and are keyed on a shaft 3 carried in bearings 3a and connected to the loom drive. Cam 1 cooperates with roller 4 and cam 2 with roller 5, the rollers being carried by a rocker member 6 having an extension 7. The rocker 6 swings on a retractable shaft 8 which is supported by a hanger member 9 and rotatable in one end of link member 10 which is swingable about an eccentric disk 12. Member 9 hangs on the stationary pin 11. There is a second rocker 6' swingable on shaft 8 and having rollers 4' and 5' cooperating with cams 1' and 2' respectively, for operating a second heddle frame 28'. In looms having more than two harness frames, there is a corresponding number of cams and rockers.

A control member 36 is pivotably connected to link member 9; this control member is operatively connected with an operating member of the loom drive, or with a clutch between said

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operating member and the shaft 3. Member 36 is responsive to the position of the shaft 8 and actuates means preventing operation of the loom when said shaft is displaced from its normal operating position. Such means are conventional and therefore not illustrated.

The eccentric disk 12 is provided with a journal 13 resting in a bearing 14 and is connected through a chain 15 and bevel gears 16 to a clutch 71 through which it may be connected, for instance to the loom drive or to a hand drive.

A driving rod 17 is equipped at one end with a head 18 having a plurality of apertures 19 into which a pin at the end of the rocker 6 may be inserted. The other end of the driving rod 17 is pivotably connected, by means of a pin 20, to a bell-crank lever 21, which is carried by a stationary pin 22. The bell-crank lever 21 is connected by means of another driving rod 25 to a bell-crank lever 24 supported by stationary pin 23. The bell-crank levers 21 and 24 are individually pivotably connected to bars 27, which extend through guides 27a and are connected to the heddle frame 28. The heddle frame has upper and lower bars 29 on which the heddles 30 provided with eyes 31 are mounted. The warp threads 32 extend through the eyes 31.

Rocker 6' actuates bell-cranks 21' and 24' which are interconnected by rod 25'. The bell-cranks 21' and 24' actuate the frame 28' for heddles 30' having eyes 31' by similar means as those by which bell-cranks 21, 24 actuate the heddle frame 28.

During normal weaving operation the shaft 3, driven by the loom drive, rotates with the cams 1 and 2 in the direction of arrow 33. Subsequent to the position shown in Fig. 1 the cam 2 presses on the roller 5 and moves the rocker 6 into its right end position 6a which is the position occupied by the actuating means for the second heddle frame 28' The mechanism 17, 21, 25, 24, 26 brings the frame 28 into its lowest position. When the rocker is in the end position 6a, the cam 1 presses on the roller 4, causing the rocker 6 to move counter-clockwise, whereby the frame 28 is pushed into its upper end position. The continued rotation of the cams 1 and 2 imparts a reciprocating movement to the frame 28. In case of an irregularity, for instance if a warp thread 32 breaks, the loom is brought to rest in a known manner. The cams 1, 2 and the heddle frame actuated by them come to rest simultaneously. For removing the cause of the standstill, for instance for inserting a new warp thread 32, it is desirable that the shed be closed; this

is accomplished by moving all heddle frames into positions in the middle between the upper and lower end positions.

As shown in Fig. 2 the harness frames 28, 28', etc., are brought from any operating position into the position of rest corresponding to the preferably closed shed, which, for instance, may be the middle position of the heddle frame, by engagement of clutch mechanism 71 whereby the eccentric disc 12 which is connected to the loom drive is operated by the chain 15 which turns the eccentric disc 12 through 180° into position 12a. Thereby member 10 is moved into position 10a through a distance corresponding to the double eccentricity. As soon as this new position has been reached, mechanism 71 automatically interrupts the drive of chain 15. Clutch mechanism 71 may be of the type disclosed in Fig. 7 of my co-pending application Ser. No. 612,864, filed August 27, 1945, and which is also illustrated in Figs. 9 to 11, re-numbered 6 to 8, of my application Ser. No. 767,418, filed August 8, 1947, under the Boykin act. It disengages automatically after rotation through a predetermined angle. The shaft 8 is brought by the motion of the eccentric 12 into the position 8a, and the rod 9 into the position 9a. Thereby member 36 is displaced into the position 36a and prevents operation of the loom or of shaft 3 by means not shown. The rocker 6 is drawn to the arresting or abutment means 34 and 35 and rests in position 6b, whereby the harness frame is held in a position corresponding to that in which the shed is closed. The rollers 4, 5 are thereby removed from the cams into the positions 4a and 5a.

When the weaving defect has been removed, the eccentric disc 12 is brought back into the operating position of Fig. 1 and the rollers 4 and 5 contact the cams 1 and 2 again and move the frame 28 into the position which it had when the loom was stopped. The control linkage 36 is brought back simultaneously into its normal position, and normal weaving can be resumed by reconnecting the shaft 3 to the loom drive.

Instead of driving each individual frame 28 of a loom by means of individual pairs of cams and two rollers co-operating therewith, other drive mechanisms may be used, as long as they are positive.

In the harness frame drive shown in Figs. 3 and 4 motion initiating means comprising a driving rod 55 is pivotably connected to a rocker or motion transmitting member 56 by means of a pin 59. Rod 55 is driven by an eccentric 51 or by a dobby. The rocker 56 is equipped with a pivot pin 37 held pivotably between two bearing blocks 58 forming a retractable support for the fulcrum 37. These blocks are guided between guides 38, and each of them is connected to a system of levers, each of which is arranged in mirror image fashion with respect to the other. Each block 58 is attached pivotably to an operating bar 39 swingably connected by a pivot pin 40 to a rod 42 and to the shorter arm of a bell-crank lever 41 which is supported on a stationary pin 44. The longer arms of the bell-crank levers 41 are individually pivotably connected to cranks 45, 45a through links 43. The cranks 45, 45a which are set at an angle of 180° are fixed to a shaft 46, on which a toothed wheel 47 is mounted. The toothed wheel 47 is connected through a chain 15 and a clutch, as in the embodiment of the invention shown in Fig. 1, to a drive, for instance the loom drive or a hand drive.

The rods 42 are connected individually through pivot pins 48 to rods 49 and 50. The rods 49 swing individually in stationary bearings 51 and each rod 50 is pivotably connected to a sliding shoe 52 carried between two guides 53. One end of rocker 56 swings between the two sliding shoes 52 and carries a pin 60 with which a driving bar 54 is movably connected. The driving bar 54 corresponds to the bar 17 shown in Fig. 1 and may be operatively connected to the harness frame 28 in the same manner as in the modification of the invention shown in Figs. 1 and 2.

Looms are usually fitted with several harness frames and several rockers 56 may be controlled by two bearing blocks 58 extending over a suitable length and at right angles to the plane of the drawing and may cooperate with sliding shoes 52 common to all rockers.

During normal operation of the loom the lever systems operating the heddle frames are in the position shown in Fig. 3. The pin 37 is held between the two bearing blocks 58. The sliding shoes 52 are so far apart that the rocker 56 can make the required rocking movements.

If it is desired to place the heddle frames 28 into their middle positions corresponding to a closed shed, for example for correcting weaving defects, such as caused by a broken warp thread, the loom is brought to rest by means not described because they do not form part of the present invention, whereby the heddle frames stop in whatever operating position they are at the moment the loom is stopped. For forming a closed shed the chain 15 is moved to rotate the cranks 45 and 45a through 180° into the position shown in Fig. 4. This causes displacement of the lever systems into the positions shown in Fig. 4. The two bearing blocks 58 are thereby moved outward and the two sliding shoes 52 inward and the driving bar 54 is brought and arrested in its middle position which corresponds to the position of the closed shed. In doing this it does not matter what position is taken up by the bar 55 and the eccentric or the dobby 57 since the rocking lever can assume any position where its pin 60 is in middle position defined by the closed-in sliding shoes 52.

After the weaving defect has been removed, the lever systems are brought back into the positions shown in Fig. 4 by rotating the cranks 45 and 45a through 180°. The sliding shoes 52 are thereby brought into their outermost positions and the bearing blocks 58 are brought together and hold the pin 37 in its middle position. The rocker 56 swings about the pivot pin 37 and, actuated by the driving bar 55, forces the heddle frames, by means of the driving bar 54 into the position corresponding to the position of the eccentric 57 and normal weaving operations are resumed.

While I believe the above described embodiments of my invention to be preferred embodiments, I wish it to be understood that I do not desire to be limited to the exact details of design and construction shown and described, for obvious modifications will occur to a person skilled in the art.

I claim:

1. In a loom for weaving, a heddle frame, a heddle frame operating mechanism comprising motion initiating means, a rocker member having a displaceable fulcrum and being connected with and adapted to be rocked by said initiating means and being connected with and operating said heddle frame, and fulcrum displacing means connected with said fulcrum and adapted to temporarily afford displacement of said fulcrum

and to render the effect of said initiating means on said rocker member ineffective.

2. In a loom for weaving, a heddle frame, a heddle frame operating mechanism comprising motion initiating means, a rocker member having a displaceable fulcrum and being adapted to be engaged and rocked by said initiating means and connected with and operating said heddle frame, fulcrum displacing means connected with said fulcrum and adapted to afford temporary displacement of said fulcrum and separation of said rocker member from said initiating means, and abutment means adapted to abuttingly engage said rocker member and hold it in a position corresponding to a predetermined position of said frame when said rocker member is separated from said initiating means.

3. In a loom for weaving, a heddle frame operating mechanism comprising heddle frame operating means, motion initiating means, rocker members connected with and adapted to be rocked by said initiating means and each having an end portion comprising pivot means swingably and individually connected with said operating means and having each another end portion comprising a rocker fulcrum, displaceable fulcrum engaging means disposed adjacent said other end portions, displaceable positioning means disposed adjacent said first end portions, and displacing means interconnecting said positioning means and said engaging means and adapted to position, temporarily, said first end portions in a predetermined position and simultaneously release said engaging means and affording lateral movement of said other end portions.

4. In a loom for weaving, a heddle frame, a heddle frame operating mechanism comprising motion initiating means, a rocker member having a fulcrum displaceable transversely to the rocking axis and being rocked by said initiating means and connected with and operating said heddle frame, and fulcrum displacing means connected with said fulcrum and comprising crank means affording, in one dead center position, placement of said fulcrum where said initiating means are fully effective on said rocker member as to the operation of said heddle frame and, in the other dead center position, placement of said fulcrum where said initiating means are ineffective on said rocker member as to the operation of said frame and the latter is in a predetermined rest position.

5. In a loom for weaving, a heddle frame, a heddle frame operating mechanism comprising motion initiating means having cam means, a rocker member having a displaceable fulcrum and being connected with and operating said heddle frame and having rollers adapted to engage said cam means, and fulcrum displacing means connected with said fulcrum and adapted to afford temporary displacement of said fulcrum and disengagement of said rollers from said cam means.

6. In a loom for weaving, a heddle frame operating mechanism comprising heddle frame operating means, motion initiating means, a rocker member having a displaceable fulcrum and being adapted to be engaged and rocked by said initiating means, fulcrum displacing means connected with said fulcrum and adapted to afford temporary displacement of said fulcrum and separation of said rocker member from said initiating means, said frame operating means comprising a connecting rod member, and connecting

means swingably interconnecting said rocker member and said rod member and being displaceable on the latter.

7. In a loom for weaving, a source of power, heddle frames, a heddle frame operating mechanism comprising actuating members driven by said source, intermediary members individually positively engaged and operated by said actuating members and individually connected with and positively operating said frames, control means positively engaging said intermediary members and adapted to render same ineffective as to the operation of said frames, and a self-disengaging clutch means interposed between said source and said control means and temporarily connecting said control means with said source.

8. In a loom for weaving, a heddle frame, a heddle frame operating mechanism comprising a movable driving member, a motion transmitting member connected with said driving member and with the heddle frame, a normally stationary support for said motion transmitting member to which it is pivotally secured, a releasable holding mechanism for said support for normally holding the support stationary, and when released, for retracting the support, whereby the motion transmitting member is rendered ineffective.

9. In a loom for weaving, a heddle frame, a heddle frame operating mechanism comprising a movable driving member, a motion transmitting member connected with said heddle frame and operatively connected to said driving member, a normally stationary support for said motion transmitting member to which it is pivotally secured, and releasable holding means for said support for normally holding the support stationary, and when released, for retracting the support whereby the motion transmitting member is disconnected from the driving member.

10. In a loom for weaving, a heddle frame, a heddle frame operating mechanism comprising a movable driving member, a motion transmitting member connected with said driving member and with the heddle frame, a normally stationary support for said motion transmitting member to which it is pivotally secured, a releasable holding mechanism for said support for normally maintaining it stationary, and when released, for retracting the support, a pair of abutments for contacting two surfaces of said motion transmitting member to hold it stationary when the pivot support is released from its normal stationary position, and a linkage connected to the support holding mechanism and to the abutments for simultaneously retracting the support from its normally stationary position and producing relative movement toward each other of said abutments for bringing them in contact with said motion transmitting member whereby the heddle frame is held stationary.

11. In a loom for weaving, a heddle frame; stationary arresting means; a heddle frame operating mechanism comprising motion initiating means, motion transmitting means connected with said frame and comprising a lever alternatively engageable by said initiating means and by said arresting means, a shaft displaceable transversely to its longitudinal axis and swingably supporting said lever, and control means comprising a displacing member connected with said shaft for placing said shaft and said lever for engaging the latter either with said initiating means for normal operation

of said frame or with said arresting means for arresting said mechanism and said frame in a predetermined position.

12. In a loom for weaving, a plurality of heddle frames, a heddle frame operating mechanism comprising motion initiating means, individual motion transmitting means individually connected with said frames and individually comprising a lever engageable by said initiating means, a shaft displaceable transversely to its longitudinal axis and swingably supporting said levers, and control means comprising a displacing member connected with said shaft for alternatively placing said shaft and said levers for engaging the latter with said initiating means for normal operation of said frames or for disengaging said levers from said initiating means.

13. In a loom for weaving, a plurality of heddle frames, a heddle frame operating mechanism comprising motion initiating means, individual motion transmitting means individually connected with said frames and individually comprising a lever engageable by said initiating means, stationary arresting means common to all levers and engageable thereby, a shaft displaceable transversely to its longitudinal axis and swingably supporting said levers, and control means comprising a displacing member connected with said shaft for alternatively placing said shaft and said levers for engaging the latter either with said initiating means for normal operation of said frames or with said arresting means for arresting said mechanism and said frames in a predetermined position.

14. In a loom for weaving, a plurality of heddle frames, a heddle frame operating mechanism comprising motion initiating means, individual motion transmitting means individually connected with said frames and individually comprising a member engageable by said initiating means, arresting means common to all said members and engageable thereby, a shaft

pivotally supporting said members, a pendulum support for said shaft rendering the shaft displaceable transversely to its longitudinal axis, and displacing means comprising an eccentric and a link member interconnecting the eccentric with said shaft for placing, upon rotation of said eccentric, said shaft and said members for engaging the latter either with said initiating means for normal operation of said frames or with said arresting means for arresting said mechanism and said frames in a predetermined position.

15. In a loom for weaving, a source of power, a heddle frame, a heddle frame operating mechanism comprising motion initiating means connected to and operated by said source, motion transmitting means connected with said heddle frame and comprising a member engageable with and normally engaged by said initiating means, a retractable support for said member, retracting means connected with said support for retracting said support and disengaging said member from said initiating means, and operating means connected with said retracting means and with and operated by said source.

16. In a loom for weaving as set forth in claim 15, said operating means comprising clutch means for connecting and disconnecting said retracting means to and from said source.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
191,317	Crompton	May 29, 1877
454,135	Hutchins	June 16, 1891
550,450	Cavanaugh	Nov. 26, 1895
1,759,673	Thatcher	May 20, 1930