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J. JABOULEY

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APPARATUS FOR TEXTILE OPERATIONS

Filed Feb. 7, 1933

FIG. 1.

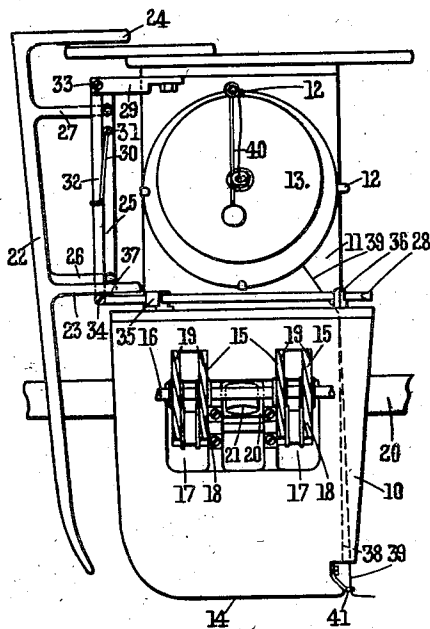


FIG. 2.

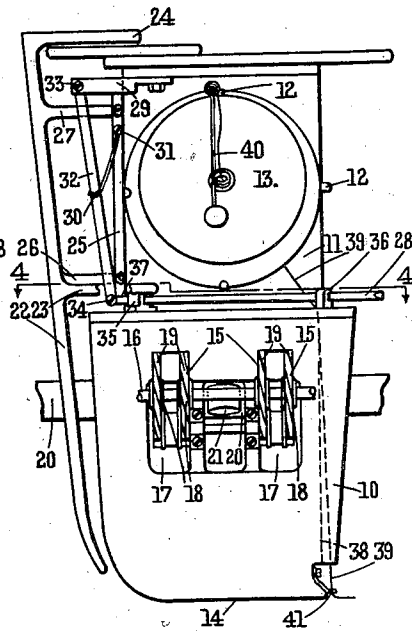


FIG. 3.

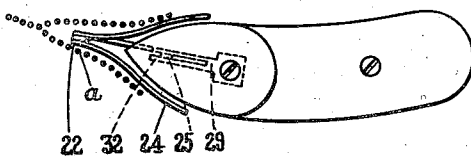
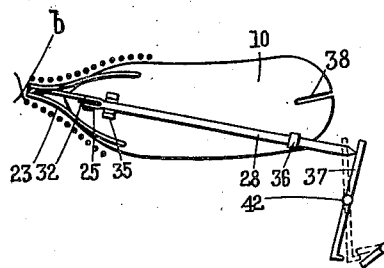


FIG. 4.



Inventor:
Joanny Jabouley
by
J. Seltzer and Blumenthal
Attorneys

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APPARATUS FOR TEXTILE OPERATIONS

Joanny Jabouley, London, England, assignor,
by mesne assignments, to Celanese Corpora-
tion of America, a corporation of Delaware

Application February 7, 1933, Serial No. 655,561
In Great Britain February 11, 1932

4 Claims. (Cl. 139—13)

This invention, which is an improvement in the invention described in my U. S. Patent No. 1,822,292, relates to apparatus for carrying out the operation of circular weaving, and has for its object to provide an improved device for the avoidance of damage to the warp threads of circular looms. In particular, the invention relates to an improved form of device by means of which jamming or breakage of the warps can readily be detected and cause to bring relative rotary motion between the shuttle or shuttles and the warps to an end before any serious damage results.

The device according to the invention consists in a feeler mounted on and before the front edge of the shuttle, the feeler being pivotally hung from the shuttle so that a very light contact of the feeler with the warps causes the feeler to be pushed back to release a latch mechanism by means of which the shuttle and the warps are caused to move at the same speed.

The feeler may be so arranged as to move parallel to itself, so that whatever the point at which the feeler contacts with the warps, the same amount of movement suffices to release the latch mechanism. Suitable guide means may be provided to cause the feeler to move in line with the front of the shuttle.

A light spring may be provided which normally urges the feeler in advance of the shuttle, but does not prevent the free backward movement of the feeler when it encounters misplaced or broken warps.

By means of the pivotal mounting of the feeler, detection of warp jamming or breakage is followed almost instantaneously by the release of the latch mechanism. In order to improve still further the sensitiveness of the detector mechanism, the latch mechanism may be of a light character and serve to release a more powerful latch mechanism by means of which the clutching together of the shuttle or shuttles and the warps is effected. Thus the first latch mechanism may release a spring sufficiently powerful to operate the second latch mechanism, which in turn releases a very strong spring operating the clutching device as described in U. S. application S. No. 655,560 filed February 7, 1933.

Though applicable to circular looms in which the shuttles rotate through sheds constituted by stationary or rotating warps, the invention is particularly advantageous in looms in which the shuttles are stationary in that it enables the relatively light mass represented by the shuttles

to be brought very rapidly to the same speed as the heavier warp and fabric carrying mechanism.

The invention will now be described in greater detail with reference to the accompanying drawing, but it is to be understood that this description is given by way of example only and is in no respect limitative.

Fig. 1 shows in elevation the warp feeling device mounted on a shuttle, in its extended position;

Fig. 2 shows an elevation of the warp feeling device mounted on a shuttle, in its repressed position;

Fig. 3 is a plan view of Fig. 1; and

Fig. 4 is a plan view taken on the line 4—4 of Fig. 2

In Fig. 1 is shown one of any convenient number of shuttles adapted to be mounted substantially vertically within the warp shed of a circular loom. Each shuttle comprises a lower boat-shaped part 10 and an upper frame 11 to which are attached clips 12 adapted to grip the inner flange of the weft spool 13 which is thus held with its axis substantially horizontal in the upper part of the shuttle. The weft 39 is unwound from the spool 13 and led through the channel 38 and the guide 41 to the fell of the cloth. The edge 14 of the lower boat-shaped part of the shuttle tapers to a narrow width and rests on the fell of the cloth, serving to beat-up the weft laid by a preceding shuttle.

The shuttles are held in position within the warp sheds by means of vane wheels 15, 15 mounted on a rotatable shaft 16 outside the warps, and extending into recesses 17 within the shuttle bodies below the spools 13. The shafts 16 are rotated at a suitable speed by gearing connected to the drive of the loom (not shown) so that as the rotating warps meet the vane wheels 15, the warps pass through the spaces 18 between the vanes 19 and so have a substantially uninterrupted motion while the shuttles are held stationary. The shuttles are also supported from the inside of the warp circle by means of a disc whose outer edge 20 presses against a roller 21 freely mounted on a substantially vertical axis in the shuttle, the inner sheet of warps passing between the edge of the disc and the roller uninterruptedly.

A feeler arm 22 bearing two pairs of wings 23, 24 to guide the two sheets of warps to the sides of the shuttle, is mounted so as to depend in front of the shuttle in a position immediately following the point of division of the threads a

(Fig. 3) into the two sheets by the warp shedding mechanism (not shown). The feeler 22 is connected by means of horizontal pieces 26, 27 to a vertical rod 25 which is fixed at 37 to a push-rod 28 at its lower extremity, and is free at its upper extremity to slide into a slot formed by a divided member 29. The vertical rod 25 carries a spring 30 fixed at 31 and hooked over the edge of a link 32 which is pivoted at its upper extremity 33 to the member forming the slot 29 and at its lower extremity 34 to the end of the push-rod 28. The link is of such length as to support part of the weight of the push-rod 28, and to a large extent the weight of the feeler arm 22 and wings 23, 24, and by reason of the link being pivoted at 33, the weight of the system is balanced so as to allow pressure upon the feeler 22 to be transferred to the push-rod 28 substantially without loss due to friction. The push-rod 28 is guided by the member 35 which constitutes an open bearing, and borne in a loose bearing 36 in such a manner as to allow of free longitudinal movement of the push-rod. The link 32 swings about its stationary pivot 33 against the action of the spring 30 which normally keeps the feeler in its advanced position.

The spring 30, however, is of such sensitive character as to allow of free backward movement on the feeler meeting an obstruction in the warp shed caused, for example, by a broken thread jamming adjacent threads as shown at *b* (Fig. 4), and preventing free division of the threads by the shedding mechanism. In operation, the feeler arm 22 is moved backwardly by slight pressure at any point along its length, the motion being transferred by means of the cross pieces 26, 27 to the vertical rod 25, which is moved simultaneously and bodily in a direction parallel to that of the feeler 22. The upper extremity of the rod 25 slides freely in the slot formed by the divided member 29 but is allowed no side play in the slot, thus maintaining the feeler arm 22 always in a vertical position irrespective of the direction of the pressure to which it may be subjected. The movement of the rod 25 urges the push-rod 28 outwardly as shown in Figs. 2 and 4 so that the tip of the push-rod passes through the warp sheets, where it may serve to operate the release of a latch mechanism

by moving the member 37 (Fig. 4) about its pivot 42 as described in U. S. application S. No. 655,560. The push-rod may be suspended entirely by the provision of a further link attached to the push-rod at a point near the end of the push-rod which penetrates the warps, and pivoted at its upper extremity at a point situated in the upper part of the shuttle. The bearing 36 may then be replaced by a guide device similar to 35 and placed at any convenient point along the length of the rod, thus allowing added freedom of action and imparting greater sensitivity to the system.

What I claim and desire to secure by Letters Patent is:—

1. A circular loom shuttle provided with means for detecting breakage or jamming of the warp threads, said shuttle comprising a feeler member, a pivoted link, and means for suspending the feeler member by the pivoted link in advance of the shuttle body so that the member is free to swing under light contact with jammed warps.

2. A circular loom shuttle provided with means for detecting breakage or jamming of the warp threads, said shuttle comprising a feeler member, a push rod connected to the feeler member, and a link forming a pivotal suspension for the feeler member and carrying the feeler member in advance of the shuttle body, said link suspension permitting the feeler member to swing freely under light contact with jammed warps so as to operate said push rod.

3. A circular loom shuttle provided with means for detecting breakage or jamming of the warp threads, said shuttle comprising a feeler member, a push rod, an upright member secured to said push rod and forming a connection between the feeler member and the push rod, guide means for the push rod and upright member, and a link forming a pivotal suspension for the feeler member and push rod to permit said members to swing freely under light contact of the feeler member with jammed warps while being guided by said guide means.

4. A shuttle according to claim 3 comprising a spring engaging the upright member and the link and adapted to urge the feeler carried by the link forwardly of the shuttle body.

JOANNY JABOULEY.