Nov. 29, 1927. 1,651,338

F. K. BROWN

LOOM FOR WEAVING OPENWORK FABRICS

Filed Dec. 10, 1926 2 Sheets-Sheet 1

Fig. 1.

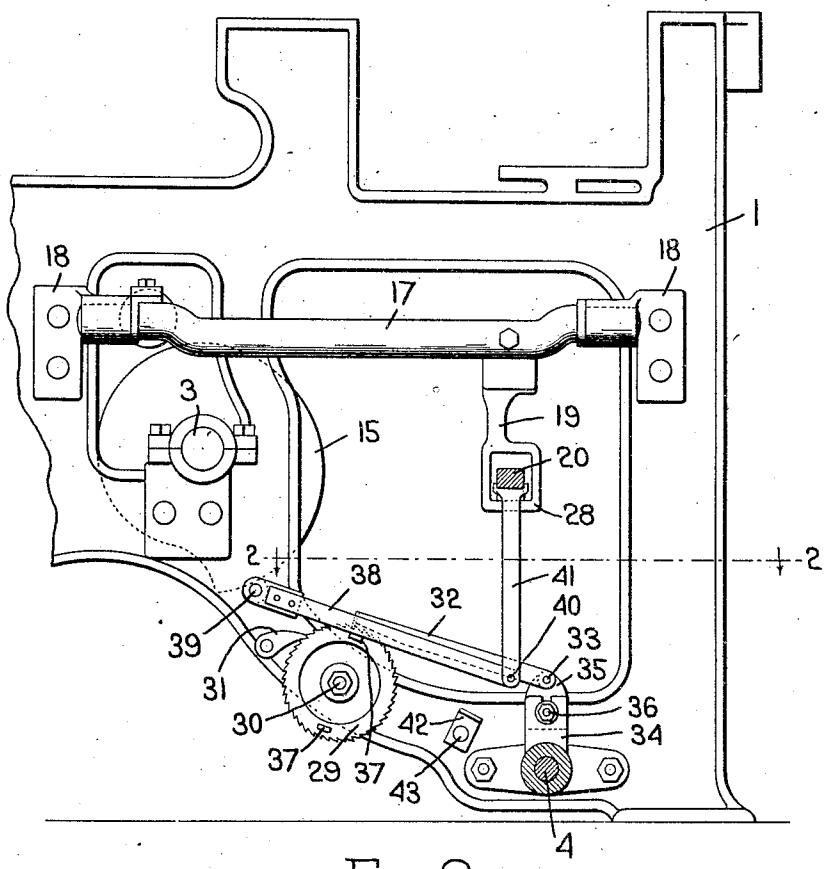
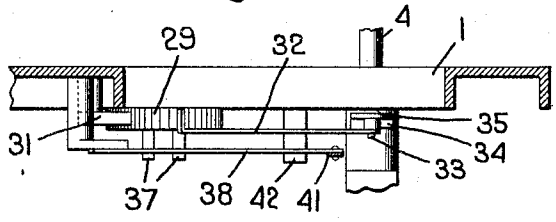


Fig. 2.



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Fig. 3.

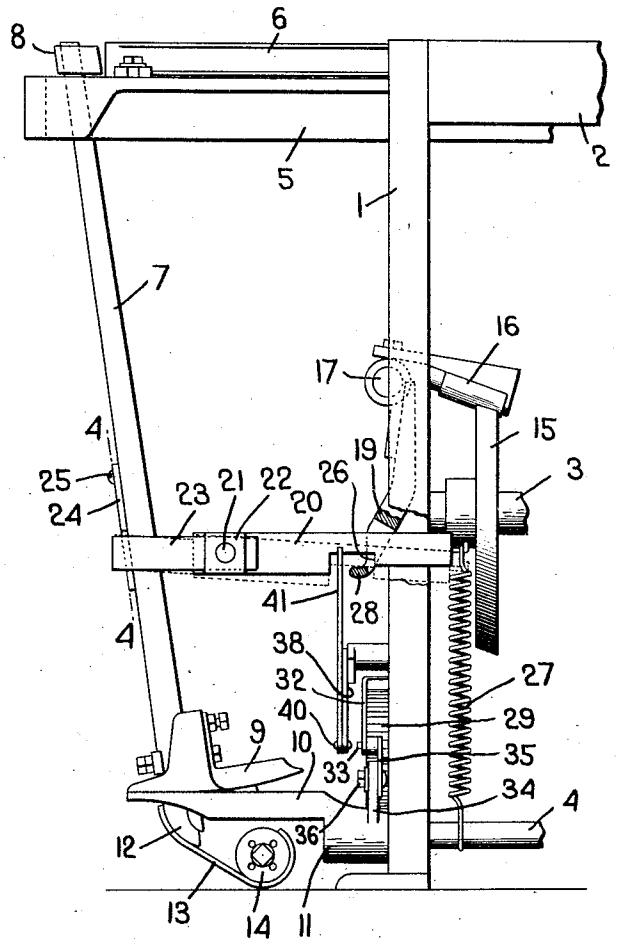
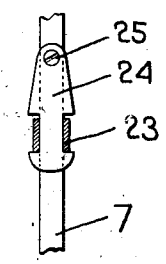


Fig. 4.



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UNITED STATES PATENT OFFICE.

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LOOM FOR WEAVING OPENWORK FABRICS.

Application filed December 10, 1926. Serial No. 153,785.

This invention relates to a loom for weaving open work fabric or a fabric in which the filling or the warp yarn or both is omitted at predetermined intervals and to a predetermined extent. The result is a fabric in which open work stripes appear extending either transversely or longitudinally of the fabric, or both transversely and longitudinally of the fabric, whereby either an open work striped effect or an open work plaid or checked effect is produced.

The striped effect extending longitudinally of the cloth is readily produced by the spacing of the warps in the reed of the loom. The present invention is concerned particularly with a means for producing the striped effect transversely of the cloth by omitting picks of filling. The most satisfactory way of accomplishing this is to suspend the picking movement of the picker stick for the required number of picks and at predetermined intervals. With the movement of the picker stick thus suspended, the shuttle remains in the box and is not picked out therefrom, and consequently no filling is laid while all the other operations of the loom continue. Thus transverse stripes of open work appear in the fabric as it is woven and the width of these stripes and their distance apart are determined by the duration of the suspension of the picking movement of the picker stick and the intervals at which this suspension occurs.

The present invention has for its object to provide a simple and efficient means for thus suspending the movement of the picker stick.

The invention has for its further object to provide such a mechanism which may be readily embodied in new looms or added to existing looms and without requiring any alteration in either the picker stick or any material alteration in the usual picker stick actuating mechanism.

The object of the invention is further to provide such a mechanism which may readily be adjusted or adapted to form any desired width of transverse open stripe or any desired spacing between the stripes.

These and other objects and features of the invention will appear more fully from the accompanying description and drawings and will be particularly pointed out in the claims.

As the invention relates entirely to the mechanism for suspending the picking movement of the picker stick and as it may be embodied in a wide variety of loom constructions, the general construction and operation of which are well known and familiar to those skilled in the art, it is only necessary here to illustrate and describe so much of an ordinary type of loom as is necessary to a disclosure of a preferred form of the invention.

In the drawings:

Fig. 1 is a view in elevation and partially in vertical cross section of a portion of the left-hand end of an ordinary type of loom, together with a preferred form of the present invention embodied therein.

Fig. 2 is a detail in horizontal cross section taken on the line 2—2 of Fig. 1.

Fig. 3 is a view in front elevation partially broken away of the same construction.

Fig. 4 is a detail in cross section taken on the line 4—4 of Fig. 3.

The loom illustrated is an ordinary, plain loom having the side frames, of which only the side frame 1 is illustrated. Between these frames extends the breast beam 2, the shaft 3 and the lay rocker shaft 4. The lay, as usual, is an oscillating or rocking structure comprising the rocker shaft 4, the swords, not shown, extending upwardly therefrom and carrying at the top the lay proper 5, the upper surface of which constitutes the raceway for the shuttle. A shuttle box 6 is provided as usual at the top of the raceway at each end of the lay.

It will usually be sufficient to suspend the operation of the picker stick at one side of the loom only and thus omit the picks of filling in groups of two or multiples of two. Consequently a mechanism such as that illustrated is provided at one side, in this case the left-hand side, of the loom.

The picker stick 7 as usual passes up through a slot in the portion 5 of the lay and is provided at its upper end with a picker 8 for engaging the shuttle tip and at its lower end with a curved rocker foot 9 seated and rocking on the upper flat face 10 of an arm 11 secured to the end of the lay rocker shaft 4. The lower end 12 of the picker stick extends through the rocker arm and has connected therewith the strap 13 extending to the spring actuated drum 14, by which the picker stick is normally rocked outwardly.

The picker actuating mechanism by

which the picking movement of the picker stick is secured is shown as of a familiar type. The shaft 3 carries a cam 15, on the periphery of which rests an arm 16 extending from a shaft 17 journalled at its ends in bearing brackets 18 secured to the loom frame. This shaft carries a depending picking arm 19. The cam 15 is so shaped and timed as to oscillate the picking arm with each alternate oscillation of the lay. The movement of the picking arm is imparted to the picker stick by a suitable connector, usually a lug strap so that as the picking arm swings inwardly, the picker stick is given its picking movement, and as the picking arm swings outwardly, the picker stick rocked by the spring drum 14 swings outwardly.

In one feature of this invention the actuation of the picker stick by the picker stick actuating mechanism, such as the picking arm, is suspended by a mechanism which receives its operation from the lay itself. In another feature of this invention the connector or lug strap is disconnected from the picking arm, while remaining connected to the picker stick so as to prevent the picking operation of the picker stick at the required intervals and for the required periods.

In the construction illustrated, the connector or lug strap device comprises a bar 20 having rigidly secured at one end thereto, as by the bolt 21 and clamping plates 22, the ends of the leather strap loop 23. This loop surrounds the picker stick and is held in position thereon by a plate 24 secured by a screw 25 to the outer face of the picker stick and provided at its sides with notches in which the loop is seated.

The bar 20 at the other end passes through a relatively large aperture in the picking arm 19 and is provided on its lower edge with a notch or recess presenting the shoulder 26. A tension spring 27 connects the free end of the bar 20 to the lay rocker shaft 4 and thus normally acts to hold the bar against the lower cross piece 28 of the picking arm and within the notch.

During the usual operation of the loom, the inward movement of the picking arm 19 carries the cross bar 28 into engagement with the shoulder 26 and thus through the connector imparts the picking movement to the picker stick. But it will be seen that if the connector made up of the bar 20 and the strap 23 be raised at its inner end against the tension of the spring 27, the notch in the bottom of the bar 20 will be disengaged from the cross bar 28 of the picking arm and the picking arm will oscillate without imparting any movement to the picker stick, which will remain in its outer position under the action of the spring drum 14.

In the preferred form of this invention disconnection of the notched bar 20 from the picking arm is effected at predetermined times and for predetermined periods by a mechanism such as that illustrated and which receives its operation directly from the lay.

A ratchet wheel 29 is journalled on the loom frame at 30. A detent pawl 31 pivoted on the loom frame prevents reverse rotation of the ratchet wheel. An actuating pawl 32 cooperating with the teeth of the ratchet wheel is pivoted at 33 to an arm extending radially from the lay rocker shaft. As illustrated, one section 34 of this arm is rigid with the lay rocker shaft and the other section 35 to which the pawl 32 is pivoted is radially adjustable by means of the bolt 36 on the section 34 so as to adjust the extent of movement imparted to the pawl. Thus at each oscillation of the lay, the ratchet wheel will be rotated one or more teeth.

The ratchet wheel is provided with one or more cams herein shown as projections 37 on the face of the ratchet wheel. An arm in the form of a lever 38 is pivoted at 39 to the loom frame and extends in the path of the cam projections 37 so as to be raised and lowered thereby. This arm at its free end has pivoted thereto at 40 an upstanding bar 41 forked at its upper end to engage the bar 20. Thus it will be seen that as each cam projection 37 comes into engagement with the lever 38, it moves the lever into such a position and holds it in such a position as, through the bar 41, to elevate the bar 20 and disconnect it from engagement with the picking arm 19, thus suspending the actuation of the picker stick for a period determined by the time the cam projection 37 remains in engagement with the lever 38 and at intervals determined by the intervals between successive engagements of the cam projections with the lever.

In the construction illustrated, where the cams carried by the ratchet wheel are in the form of projections 37, it is desirable to provide some means for limiting the downward movement of the lever 38 and for this purpose a stop bracket 42 is shown secured at 43 to the loom frame in position to support the lever 38 when it has been lowered sufficiently to permit engagement of the bar 20 with the picking arm.

The width of the open work stripes and the intervals between these stripes are readily predetermined as desired by adjusting the arm 34—35 to vary the movement of the pawl 32, by varying the size of the ratchet wheel or the number of teeth, by varying the number and circumferential length of the cam projections 37 or by any other suitable means.

The invention thus presents a simple and efficient mechanism readily embodied in or

attached to a loom and capable of producing any required open work stripe effect, and the accurate timing of which is insured by its operation from the lay.

Having thus described the invention, what is claimed as new, and desired to be secured by Letters Patent, is:

1. A loom comprising a picker stick, picker stick actuating mechanism, a connecter connected to the picker stick and disengageably connected to the picker stick actuating mechanism, and means for effecting disconnection of the said connector from the said actuating mechanism at predetermined intervals for a predetermined number of actuating movements.

2. A loom comprising a lay, a picker stick, a picking arm, means for oscillating the picking arm with each alternate oscillation of the lay, a lug strap connected to the picker stick and disengageably connected to the picking arm, and means for effecting disconnection of the lug strap from the picking arm at predetermined intervals for a predetermined number of oscillations of the picking arm.

3. A loom comprising a lay, a picker stick, a picker stick actuating mechanism and means operated by the lay for suspending the actuation of the picker stick by the actuating mechanism at predetermined intervals for predetermined periods.

4. A loom comprising a lay, a picker stick, a picker stick actuating mechanism, a ratchet wheel, a cam carried by the ratchet wheel, an arm moved and held by the cam, when positioned by the ratchet wheel, to effect the suspension of the actuation of the picker stick by the actuating mechanism, a pawl cooperating with the ratchet wheel, reciprocated by the oscillation of the lay, and acting to position the cam thus to effect said suspension at predetermined intervals and for predetermined periods.

5. A loom comprising a frame, a lay including a rocker shaft, a picker stick, a picker stick actuating mechanism, a ratchet wheel journalled on the frame, an arm extending radially from the lay rocker shaft, a pawl pivoted to said arm and cooperating with the ratchet wheel to advance the ratchet wheel at each oscillation of the lay, a cam projection carried by the ratchet wheel, a lever pivoted to the frame and extending in the path of the cam projection and acting when engaged by the cam to suspend the actuation of the picker stick by the actuating mechanism at predetermined intervals for predetermined periods.

6. A loom comprising a lay, a picker stick, a picking arm, means for oscillating the picking arm with each alternate oscillation of the lay, a lug strap connected to the picker stick and disengageably connected to the picking arm, a ratchet wheel, a cam carried therewith, an arm moved and held by the cam, when positioned by the ratchet wheel to effect the disconnection of the lug strap from the picking arm and a pawl cooperating with the ratchet wheel and reciprocated by the oscillation of the lay and acting to position the cam to effect said disconnection at predetermined intervals for a predetermined number of oscillations of the picking arm.

In testimony whereof, I have signed my name to this specification.

FREDERICK K. BROWN.