April 16, 1968 T. FRANSEN 3,378,042

MECHANISM FOR SIMULTANEOUSLY VARYING THE SPEED OF MOVEMENT AND DWELL TIME OF A REED

Filed Feb. 16, 1966 2 Sheets-Sheet 1

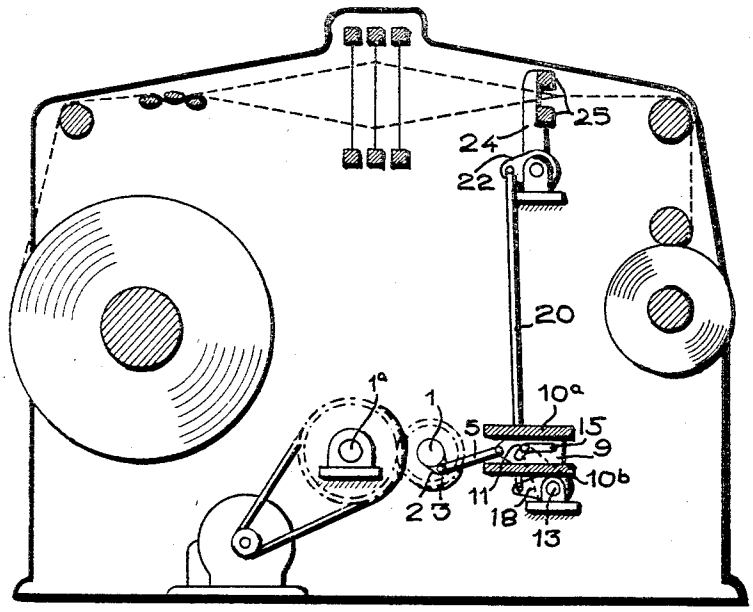

Fig. 1

April 16, 1968 T. FRANSEN 3,378,042

MECHANISM FOR SIMULTANEOUSLY VARYING THE SPEED OF MOVEMENT AND DWELL TIME OF A REED

Filed Feb. 16, 1966 2 Sheets-Sheet 2

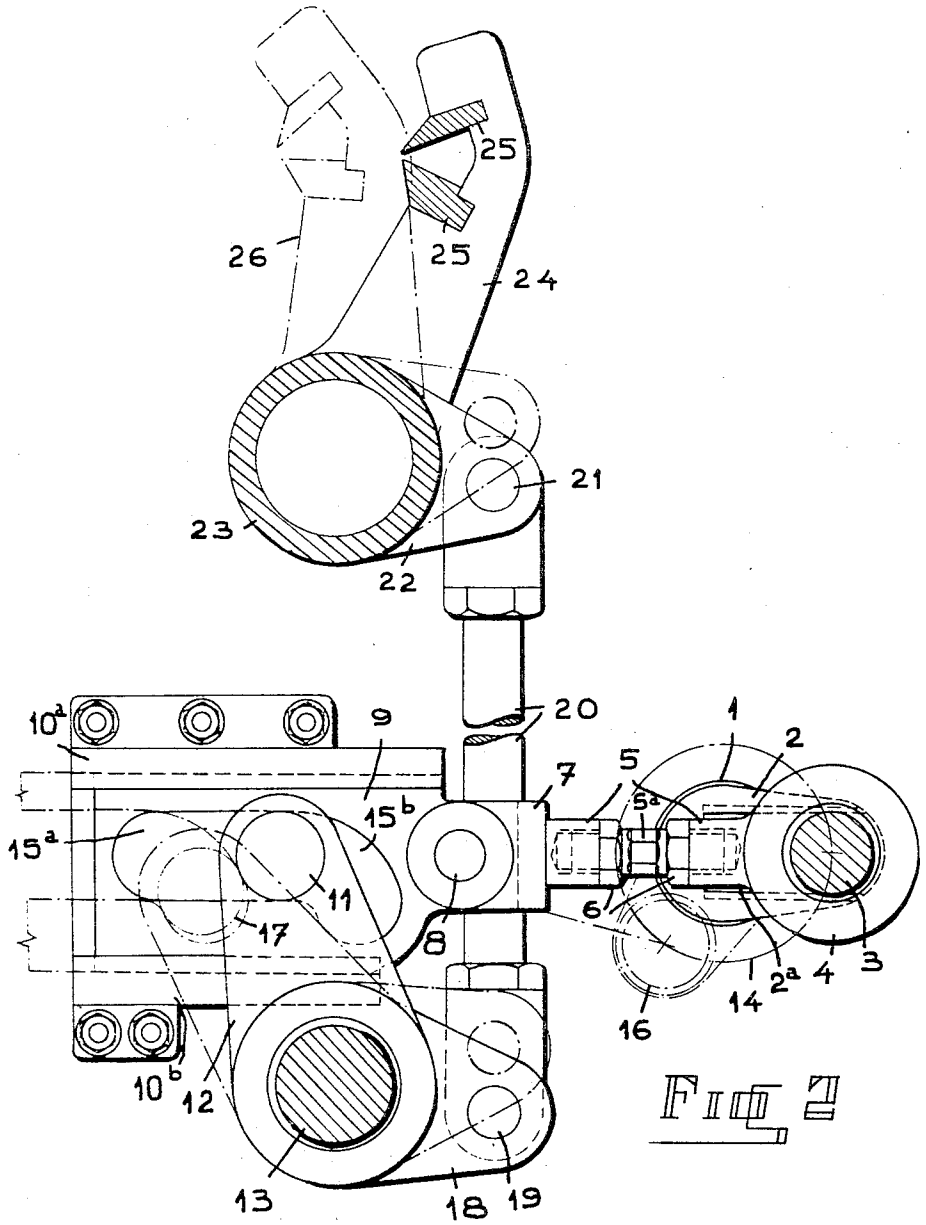

FIG 2

United States Patent Office 3,378,042 Patented Apr. 16, 1968

3,378,042

MECHANISM FOR SIMULTANEOUSLY VARYING THE SPEED OF MOVEMENT AND DWELL TIME OF A REED

Theodorus Fransen, Heuvelstraat 24, Deurne, North Brabant, Netherlands

Filed Feb. 16, 1966, Ser. No. 527,702
Claims priority, application Netherlands, Feb. 19, 1965, 65/2,155
1 Claim. (Cl. 139—190)

ABSTRACT OF THE DISCLOSURE

Mechanism for simultaneously adjusting the speed of movement and dwell time of a reed, comprising a driving member which is mounted to oscillate and has a slot having a portion extending in the direction of oscillation and an adjacent portion deviating from the direction of oscillation, a driven member having a pin engaged in the slot and having a driving connection with the reed, a rotary crank having a crank pin mounted for adjustment radially of the crank to vary the stroke of the crank, and a connecting rod which extends between the crank pin and the driving member to oscillate the driving member, and which is adjustable in length to permit the path of movement of the reed to be held constant when the stroke of the crank is adjusted to vary the speed of movement and dwell time of the reed.

The invention relates to a loom, having a reed, which can be driven by means of a rotatable shaft provided with a crank means and a connecting rod cooperating with said crank means.

When the production speed of looms is to be increased difficulties have been met with regard to the driving of the lay carrying the reed, because the heavy mass of the lay must perform a forward and return stroke in order to perform its beating action. It is desirable to make the beating stroke of the reed as small as possible in order to decrease the kinetic energy. Another difficulty, which has been met in increasing the production speed of a loom is the period of time, which is available for inserting a weft into the shed, because the period during which the reed is in a retracted position is very small when a loom operates with a high production speed.

Summary of the invention

The object of the invention is to obtain a loom in which the fraction of the cycle of the movement of the lay during which the reed is in its retracted position, thus that position in which a weft can be inserted into the shed, can be adjusted precisely to provide just the necessary stagnation period in that position, in order to allow a maximum fraction of the cycle for the movement of the lay.

According to the invention this is attained in that the driving means for the reed comprises a crank of adjustable radius and a connecting rod of adjustable length which is coupled to a slide block adapted to make a reciprocable movement upon rotation of the crank means and which slide block is provided with a slot in which a crank pin of a rotatably supported shaft fits, which shaft is coupled to the lay carrying the reed, whereas said slot is positioned parallel to the path of movement of said slide block, which slot at one end possesses a part, which is deviated from the path of said movement.

Now a period of stagnation can be obtained in the cycle of movement of the lay during which stagnation period a weft can be inserted into the shed.

This stagnation period occurs during the period that the pin of the rotatably supported shaft remains in that part of the slot which is positioned parallel to the path of movement of the slide block and no angular displacement is transferred to the rotatably supported shaft, whereas the rotatable shaft provided with the crank to which the connecting rod is connected can perform an angular displacement. When the slide block is displaced in such a manner that the part of the slot deviating from the path of movement of the slide block contacts the crank pin, the rotatably supported shaft executes an angular displacement, which can be transferred to the reed. As the deviated part of the slot is positioned at the end thereof the crank to which the connecting rod is connected is at the dead point and the rectilinear motion of the slide block is relatively small. The driving of the crank by means of this slot is very supple, owing to which this driving is particularly noiseless, particularly because the slot in the slide block is adapted in such a manner, that the crank pin is always locked up with diametrically positioned sides within the slot.

Brief description of the drawings

The invention will be described by an embodiment with reference to the accompanying drawing, in which:

FIG. 1 is a diagrammatic vertical section through a loom showing the essential parts, and

FIG. 2 is a side view of the driving mechanism for the reed, partly shown in cross section.

Description of the preferred embodiment

The main shaft 1*a* of the loom or a shaft 1 connected to this main shaft 1*a* rotates with constant angular displacement. The shaft 1 carries a crank 2 having a crank pin 3. The crank pin 3 is indicated in cross section in FIG. 2. The shaft 1 is supported in bearings connected to the frame of the loom which bearings are not shown in the drawing. Referring further to FIG. 2 the head 4 of a connecting rod 5 fits around the crank pin 3. The length of the connecting rod 5 is adjustable by means of a central part 5*a*, which is threaded into the end portions of the connecting rod by means of left and right screw threads. The part 5*a* can be locked with respect to the end portions of the connecting rod 5 by means of lock nuts 6. The connecting rod 5 possesses a fork at 7 in which a pivot pin 8 fits. A part of the slide block 9 fits around the pivot pin 8. The slide block 9 can slide in a guide of which the upper part 10*a* and the lower part 10*b* are visible in the drawing. The guide is fastened to the frame of the loom.

The slide block 9 possesses a slot 15 to accommodate a crank pin 11 mounted on a crank 12 positioned next to the slide block 9, which crank is a part of a rotatably supported shaft 13. The shaft 13 is mounted in bearings fastened to the frame of the loom not shown in the drawing.

On rotation of the shaft 1 the crank pin 3 moves according to the crank circle 14 indicated with a dash dotted line. The slide block 9 is reciprocated by the connecting rod 5. The part 15*a* of the slot is positioned parallel to the path of movement of the slide block 9. The crank pin 11 remains in its indicated position during a considerable part of the movement of the crank pin 3 around the crank circle 14, because the part 15*a* of the slot can move past the crank pin 11. The slot in the slide block 9 possesses a part 15*b* deviating from the path of movement of the slide block. In a position of the crank 2 and the crank pin 3, which position is indicated by a dash dotted line 16 the deviated part 15*b* of the slot link in the block 9 contacts the crank pin 11. Owing to this the crank pin 11 is urged into a position which is indicated by a dash dotted line 17. As a result

the shaft **13** makes an angular displacement. When the crank pin **11** comes into the position which is indicated by the dash dotted line **17** the crank **2** is in such a position that the slide block comes to the end of its stroke. The crank pin is in its dead point with respect to the slide block **9** and with further movement the crank pin **11** is retracted until it leaves the part **15***b* of the slot and arrives in the part **15***a* of same. During further rotation of the crank **2** the crank pin **11** will not be displaced until after the movement of the slide block **9** has been reversed.

The shaft **13** possesses a crank **18** in which a pin **19** is mounted. A connecting rod **20** is connected to this pin **19** and the upper end of the connecting rod **20** is connected to a pin **21** of a crank **22**, which crank **22** is connected to a rotatably supported hollow shaft **23**. The hollow shaft **23** is a part of the frame of the reed. At both sides of the shed the hollow shaft **23** possesses projecting arms **24** in which the bars **25** of the reed are fastened. When the shaft **13** makes an angular displacement, during which the crank pin **11** moves from the position indicated by full lines to a position indicated by a dash dotted line **17** the reed will move to its beating position which is indicated by a dash dotted line **26**.

It is clear that the reed during a considerable part of its cycle of movement remains in a retracted position indicated by full lines. This part of the cycle of movement is obtained by the part **15***a* of the slot which part is positioned parallel to the path of displacement of the slide block **9**. During a very short part of the cycle of movement obtained by the action of the part **15***b* of the slot in the slide block **9** the crank pin **11** will be displaced and the beating movement of the reed is exerted.

In this manner a long stagnation period is obtained in the cycle of movement of the reed, during which stagnation period a weft can be inserted into the shed.

If desired an adjustment of the stagnation period is possible, because no longer stagnation period of the reed will be chosen than strictly necessary. The period during which the reed stagnates can be changed when use is

made of the crank **2**, which crank is provided with a slot **2***a* in which the crank pin **3** is adjustably mounted. The eccentricity of the crank is thus adjustable. When now the length of the connecting rod is accordingly adjusted by means of the part **5***a* the angle of displacement on the crank circle can be set to vary the stroke of the slot in such a manner, that during a determined angle the crank pin **11** remains for a longer or shorter residual part of the stroke in the part **15***a* of the slot. The part **15***a* creates during the stroke of the slide block, the period of stagnation of the reed.

I claim:

1. A loom comprising a reed, a driving member which is mounted to oscillate and has a slot having a portion extending in the direction of oscillation and an adjacent portion deviating from the direction of oscillation, and a driven member having a pin engaged in such slot and having a driving connection with the reed, wherein the improvement comprises a rotary crank having a crank pin mounted for adjustment radially of the crank to vary the stroke of the crank, and a connecting rod which is pivoted to the crank pin and to the driving member to oscillate the driving member, and which is adjustable in length to permit the path of movement of the reed to be held constant when the stroke of the crank is adjusted to vary the speed of movement and dwell time of the reed.

References Cited

UNITED STATES PATENTS

1,747,722	2/1930	Lucas	139—190
3,097,669	7/1963	Banks	139—190
3,139,118	6/1964	Svaty et al.	139—127

FOREIGN PATENTS

399,381	4/1909	France.
1,310,490	10/1962	France.
28,567	1907	Great Britain.

MERVIN STEIN, *Primary Examiner.*

J. KEE CHI, *Assistant Exmainer.*