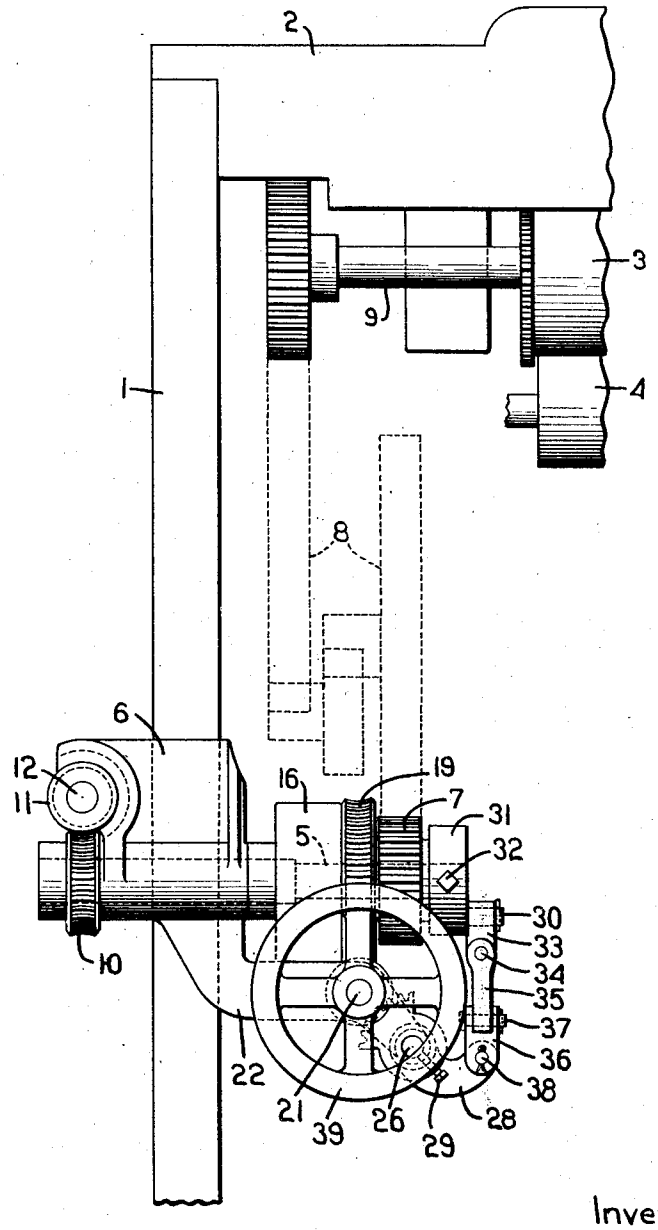
Nov. 24, 1931. C. H. DRAPER 1,833,884

LOOM FOR WEAVING THICK AND THIN STRIPED FABRICS

Filed Feb. 26, 1931 2 Sheets-Sheet 1

Fig.1.



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Fig.2.

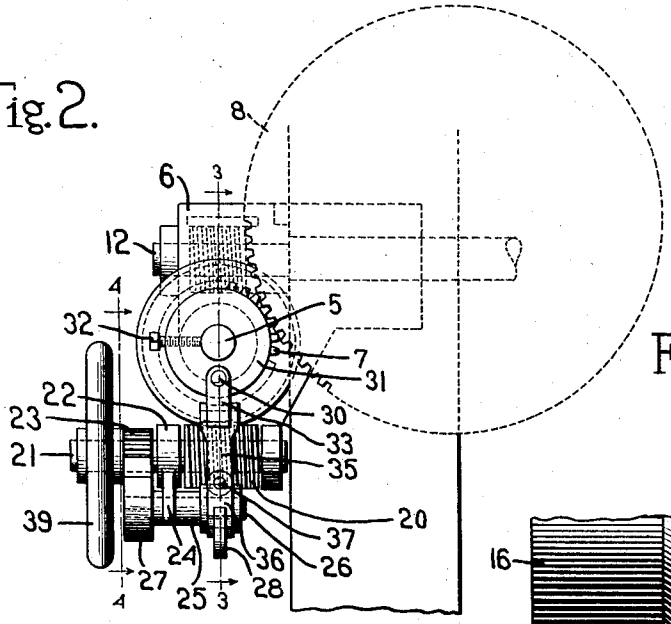


Fig.4.

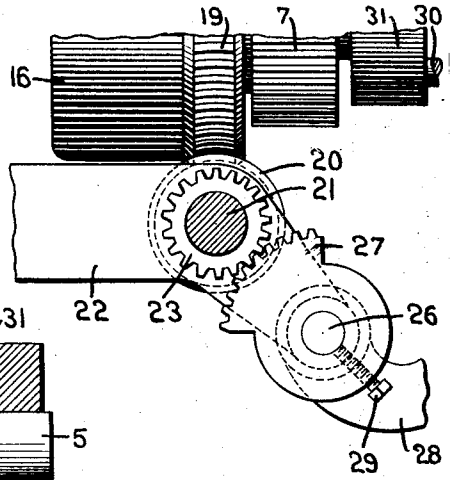
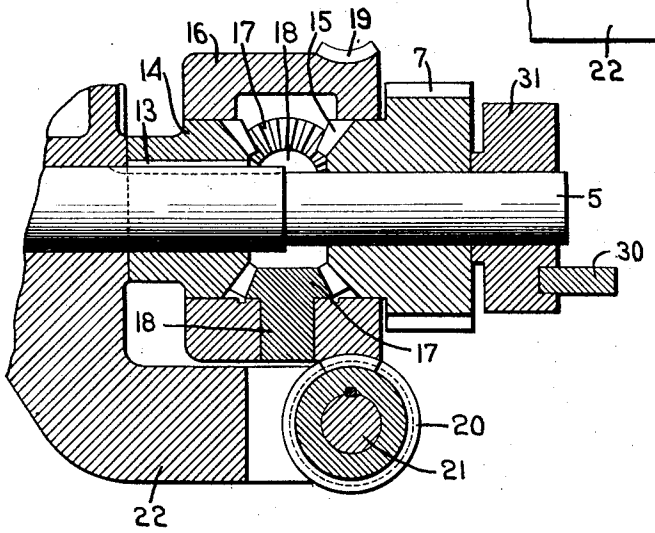


Fig.3.



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UNITED STATES PATENT OFFICE

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LOOM FOR WEAVING THICK AND THIN STRIPED FABRICS

Application filed February 26, 1931. Serial No. 518,317.

This invention relates to a loom operating to vary the condensation of the filling in the cloth as it is woven so as to produce thick and thin places transversely of the cloth and thereby give a transverse striped effect.

The object of the invention is to provide means for effecting intermittently a rotary shift of the take-up roll in opposite directions during the weaving operation so as to produce the desired effect.

The object of the invention is further to provide means for effecting such a rotary shift of the take-up roll in opposite directions in regular alternation to a predetermined extent so as to produce in regular alternation similar decreases and increases in the condensation of the filling.

The object of the invention is further to provide means for effecting such rotary shift of the take-up roll while at the same time maintaining a positive driving connection from the driving element to the take-up roll.

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

As the invention is applicable to various types of looms and as the general construction and operation of such looms is well known and familiar to those skilled in the art, it is only necessary here to illustrate and describe those features of an ordinary type of loom with which a preferred embodiment of the present invention is concerned. The preferred embodiment of the invention illustrated makes use of much of the mechanism disclosed in my pending application, Serial No. 429,408, filed February 18, 1930. But this mechanism is here utilized for securing entirely different results.

In the drawings:

Fig. 1 is a front elevation partially broken away of a portion of a loom with the preferred form of the invention embodied therein.

Fig. 2 is a view in elevation of a portion of the construction shown in Fig. 1 looking toward the right of that figure.

Fig. 3 is an enlarged detail chiefly in vertical cross section taken transversely of the driving shaft on the line 3—3 of Fig. 2.

Fig. 4 is a detail on a larger scale in cross section taken on the line 4—4 of Fig. 2.

The loom comprises the usual side frames of which a portion of the left-hand frame 1 is shown with the breast beam 2 extending therefrom to the opposite side frame. A usual form of take-up roll 3 is journalled in the side frames under the breast beam and usually presents a roughened surface to grip the cloth which is wound on the cloth roll 4 by frictional engagement with the take-up roll. A shaft 5 is journalled in a bearing bracket 6 supported on the bottom of the frame and this shaft has journalled thereon a gear 7. A train of gearing which may be of any suitable arrangement and indicated generally at 8 extends from the gear 7 to the shaft 9 of the take-up roll so that any rotation imparted in either direction to the gear 7 will in turn be positively and definitely imparted to the take-up roll. But it will be understood that the particular driving connections between the element 7 and the shaft 9 of the take-up roll may be of any suitable construction so long as they act to impart positively, directly, and accurately the rotation of the take-up roll in either direction according to the direction of rotation of the element 7.

The shaft 5 has keyed thereto a worm wheel 10 and this worm wheel meshes with and is driven by a worm 11 keyed to a shaft 12 journalled in the bearing bracket 6 and extending rearwardly in the loom frame and positively driven from one of the usual loom shafts. The shaft 5 has also keyed thereto at 13 a bevelled gear 14. The shaft 5 with this gear 14 constitutes a positively driven element which in this case is the driving element for the take-up roll. But the means by which the final driving element, or in this case the bevelled gear 14, is given a positive rotation may be of any suitable form and construction and specifically considered forms no part of the present invention.

A driven element in the form of a bevelled gear 15 is journalled in axial alignment with the driving element or bevelled gear 14 and

is preferably for that purpose journalled on the shaft 5. This driven element 15 imparts a direct driving connection to the take-up roll and for that purpose is preferably formed rigid or integral with the gear 7 and thus acts through the train of gearing 8 to drive the take-up roll.

A differential system of gearing is illustrated including the bevelled gears 14 and 15 and comprises a cylindrical housing 16 rotatable coaxially of the shaft 5 and provided with one or more intermediate bevelled gears 17 herein shown as three in number having their shafts 18 journalled radially in the housing and so arranged that the bevelled gears 17 mesh with both of the bevelled gears 14 and 15.

The outer cylindrical surface of the housing 16 is formed to present a worm wheel 19 and this worm wheel 19 meshes with a worm 20 secured to an auxiliary or transverse shaft 21 journalled in portions 22 of the bearing bracket 6.

A gear 23 is secured to the auxiliary shaft. A bracket arm 24 depending from one of the portions 22 of the bracket 6 presents a bearing sleeve 25 extending beneath and parallel with the auxiliary shaft 21. In this bearing sleeve is journalled a lever. This lever comprises the pivot shaft 26, the rearwardly extending arm formed in the shape of a sector gear 27 meshing with the gear 23 on the auxiliary shaft 21 and the forwardly extending arm 28. The arm constituting the sector 27 is adjustably secured to the shaft 26 by the set screw 29. A crank is formed on the driving shaft 5 and is here shown as a pin 30 formed on or secured to a collar 31 in turn adjustably secured to the end of the shaft 5 as by the set screw 32. A pitman extends from the crank pin 30 to the arm 28 of the lever and presents the required universal connections for that purpose. As illustrated, this pitman comprises a block 33 journalled on the crank pin 30 and transversely journalled at 34 in the bifurcated upper end of the link 35. This link at its lower end is journalled in the bifurcated upper end of the block 36 on the pin 37 extending parallel with the crank pin 30 and the block 36 at its bifurcated lower end is journalled on the pin 38 in the arm 28.

A hand wheel 39 is secured to the auxiliary shaft 21 by means of which such shaft may be turned manually in adjusting the apparatus or, when desired, by releasing one or both of the set screws 29, 32.

It will thus be seen that there is at all times a positive connection extending from the driving element, that is, the shaft 5 and bevelled gear 14, through to the take-up roll. This is because the bevelled gear 14 is geared through the intermediate gears 17 to the bevelled gear 18 which is secured to the gear 7 and this gear 7 is in turn geared to the take-up roll shaft. Consequently if the housing 16 is held against rotation, the take-up roll will be driven positively at a fixed ratio of speed relatively to the shaft 5 and the cloth produced will be uniform with the filling uniformly beaten up or condensed therein.

But if the housing 16, which is the intermediate element of the differential gearing, be rotated intermittently in opposite directions, such rotation will effect a rotary shift of the take-up roll relatively to the driving element in correspondingly opposite directions. When the take-up roll is thus relatively shifted in the taking up direction, it is obvious that the condensation of the filling in the cloth will be decreased, producing a thin place, and, when the rotation is in the opposite direction, the condensation of the filling will be increased, producing a thick place. Consequently by controlling the position of the housing and intermittently rotating it in opposite directions to a predetermined extent, a variety of patterns may be produced in the cloth by the variations in the condensation of the filling.

In the construction illustrated, this relative rotary shift of the take-up roll with respect to the driving element is produced by rotating the housing alternately in opposite directions by means of the connections extending to the driving shaft 5 which have been described. In the case illustrated, the intermittent rotary shift of the take-up roll in opposite directions takes place in regular alternation and during equal periods of predetermined extent determined by the crank and sector gear mechanism extending from the shaft 5 to the auxiliary shaft 21. It will also be seen that this rotary shift of the take-up roll relatively to the driving element in either direction is accomplished without disconnecting from the take-up roll the means for driving it so that there is no break at any time in the train of permanent connections extending between the driving element and the take-up roll.

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

1. A loom comprising a take-up roll, means for driving the take-up roll in a direction to effect take-up, and means acting to give intermittently in opposite directions rotary shift of the take-up roll relative to its driving means thereby to vary the condensation of the filling in the cloth.

2. A loom comprising a take-up roll, means for driving the take-up roll in a direction to effect take-up, and means acting to give in regular alternation in opposite directions a predetermined amount of rotary shift of the take-up roll relative to its driving means to produce in regular alternation similar de-

creases and increases in the condensation of the filling in the cloth.

3. A loom comprising a take-up roll, means for driving the take-up roll in a direction to effect take-up, and means acting without disconnecting the said driving means from the take-up roll to give intermittently in opposite directions rotary shift of the take-up roll relative to its driving means thereby to vary the condensation of the filling in the cloth.

4. A loom comprising a take-up roll, means for driving the take-up roll in a direction to effect take-up, means acting without disconnecting the said driving means from the take-up roll to give in regular alternation in opposite directions a predetermined amount of rotary shift of the take-up roll relative to its driving means to produce in regular alternation similar decreases and increases in the condensation of the filling in the cloth.

5. A take-up mechanism for looms comprising a driving element, a take-up roll, a train of permanent connections between said driving element and take-up roll, and means for moving one of said connections intermittently in opposite directions to effect rotary shift of the take-up roll in opposite directions relative to the driving element thereby to vary the condensation of the filling in the cloth.

6. A take-up mechanism for looms comprising a driving element, a take-up roll, a train of permanent connections between said driving element and take-up roll, and means for moving one of said connections in regular alternation in opposite directions to effect a predetermined amount of rotary shift of the take-up roll in opposite directions relative to the driving element thereby to produce in regular alternation similar decreases and increases in the condensation of the filling in the cloth.

7. A loom comprising a take-up roll, a driving element, a permanent positive driving connection from the driving element to the take-up roll, and means acting intermittently to shift the rotary position of the take-up roll in opposite directions with respect to the driving element thereby to form thick and thin places transversely of the cloth.

8. A loom comprising a take-up roll, a driving element, a permanent positive driving connection from the driving element to the take-up roll, and means operated by the driving element acting intermittently to shift the rotary position of the take-up roll in opposite directions with respect to the driving element thereby to form thick and thin places transversely of the cloth.

9. A loom comprising a take-up roll, a driving element, a differential system of gearing between the driving element and the take-up roll for driving the latter from the former to effect take-up, and means acting intermittently to rotate bodily in opposite directions the intermediate element of the differential gearing thereby to shift in opposite directions the rotary position of the take-up roll with respect to the driving element and produce variations in the condensation of the filling in the cloth.

10. A loom comprising a shaft, means for positively driving the shaft, a driving gear secured to the shaft, a driven gear journalled in axial alignment with the shaft, a take-up roll, a gearing connection between the take-up roll and the driven gear, a housing rotatable coaxially with the shaft, an intermediate gear journalled in the housing and meshing with the driving and driven gears, and means acting to control the position of the housing and intermittently rotate the housing in opposite directions thus to effect a take-up action of the cloth with predetermined variations in the condensation of the filling therein.

11. A loom comprising a shaft, means for positively driving the shaft, a driving gear secured to the shaft, a driven gear journalled in axial alignment with the shaft, a take-up roll, a gearing connection between the take-up roll and the driven gear, a housing rotatable coaxially with the shaft, an intermediate gear journalled in the housing and meshing with the driving and driven gears, an auxiliary shaft, a gearing connection between the auxiliary shaft and housing, and means for rotating the auxiliary shaft alternately in opposite directions thereby to shift the rotary position of the take-up roll relatively to the driving shaft and vary the condensation of the filling in the cloth.

12. A loom comprising a shaft, means for positively driving the shaft, a driving gear secured to the shaft, a driven gear journalled in axial alignment with the shaft, a take-up roll, a gearing connection between the take-up roll and the driven gear, a housing rotatable coaxially with the shaft, an intermediate gear journalled in the housing and meshing with the driving and driven gears, an auxiliary shaft, a gearing connection between the auxiliary shaft and housing, a crank operated by the driving shaft and an oscillatory connection between the crank and the auxiliary shaft whereby the crank acts to oscillate the auxiliary shaft alternately in opposite directions and thereby effects a variation in the condensation of the filling in the cloth.

13. A loom comprising a shaft, means for positively driving the shaft, a driving gear secured to the shaft, a driven gear journalled in axial alignment with the shaft, a take-up roll, a gearing connection between the take-up roll and the driven gear, a housing rotatable coaxially with the shaft, an intermediate gear journalled in the housing and meshing with the driving and driven gears,

an auxiliary shaft, a gearing connection between the auxiliary shaft and housing, a gear on the auxiliary shaft, a lever having one arm in the form of a sector gear in engagement with the gear on the auxiliary shaft, a crank on the driving shaft, and a pitman connection from the crank to the other arm of the said lever.

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

CLARE H. DRAPER.