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PATTERN MECHANISM FOR TWIST LACE MACHINES

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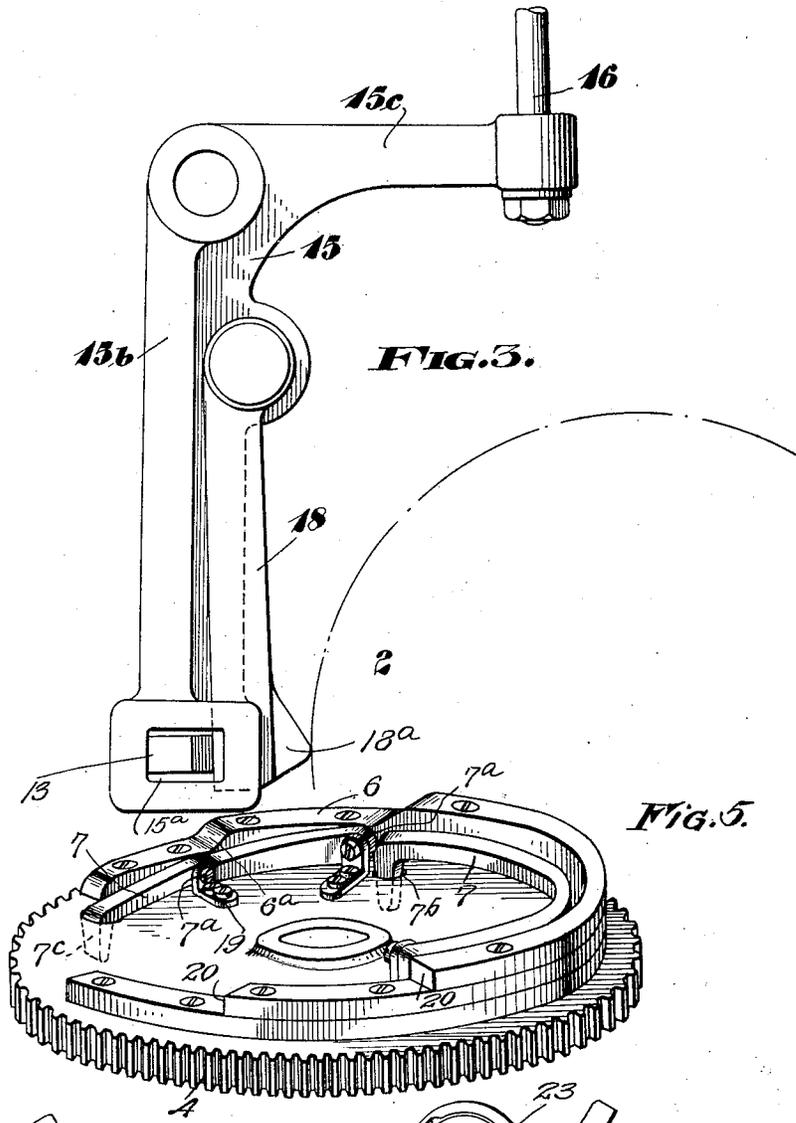
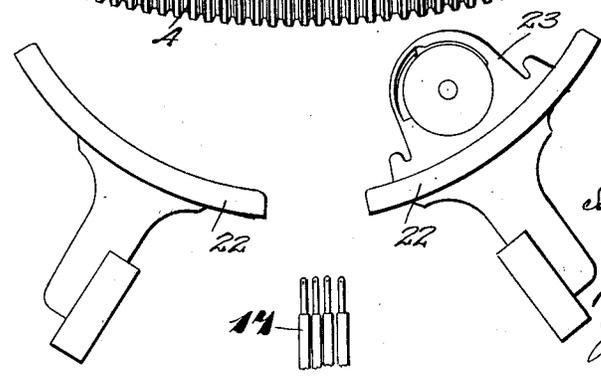


FIG. 4.



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PATTERN MECHANISM FOR TWIST-LACE MACHINES.

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This invention comprises improvements in or relating to twist lace machines and fabrics produced thereon and relates to the class of twist lace machines known as plain net curtain lace machines, the object of the invention being to considerably widen the field of utility of plain net machines by the provision of simple and effective means which will enable such machines to produce patterned fabrics.

The principal feature of the invention consists in the production of a patterned fabric on a plain net machine by the introduction during the customary operation of the machine of one or more threads in addition to those employed in making the net.

Another feature of the invention consists in a plain net machine having, in addition to the usual guide bars for the warp threads which twist with the bobbin threads in the production of the net, one or more guide bars for a patterning thread or threads, said additional bar or bars being operated so as to shog the patterning thread or threads lengthwise of the machine in both directions.

A further feature consists in the provision of simple and easily operable mechanism for effecting and ensuring a particularly rapid shogging movement of the patterning thread or threads so as to prevent said thread or threads from fouling the bobbin carriages during the movement of said carriages backwards and forwards across the machine well.

For the purpose of more fully describing the nature of this invention, reference will now be made to the accompanying drawings, wherein:—

Fig. 1 illustrates in elevation mechanism adapted to be installed upon a plain net machine for producing patterned fabrics.

Fig. 2 is a plan view on line A—A of Figure 1.

Fig. 3 is a plan view on an enlarged scale of a portion of the mechanism shown at the upper part of Figure 1.

Fig. 4 is a view of the machine well showing the position of the additional thread guide bars.

Fig. 5 is a perspective view of the cam wheel 4 and associated parts.

Fig. 6 is a perspective view of a section of the wheel shown in Fig. 5 and on a larger

scale than that view, illustrating the operation of the machine.

In one method of carrying out the invention, upon the upright motion shaft 1 usually provided at the end of a plain net machine of the well known type, and preferably beneath the customary pattern or motion wheels 2 on said shaft which are formed with operating cams or knobs 21, is mounted a gear wheel 3 which meshes with a comparatively larger gear wheel 4 mounted upon a second vertical shaft 5. On the upper face of the larger gear wheel 4 at or near the circumferential edge of same one or more flat-topped steps 6 are cut or formed, the rises 6^a of said steps being inclined, and in connection with each of said rises a pivoted gravity member 7 is provided. Each of said gravity members 7 comprises a short arm lying alongside the stepped rim or cam 6 and pivoted at 7^a to a bracket or other suitable support 19, its opposite or free end extending within a slot 7^b in the wheel 4, the upper edge or face of the arm being flat while the lower face is formed with a downwardly projecting nose 7^c at that part farthest removed from the pivot extending through the opening 7^b.

When in the normal position the downwardly projecting nose 7^c of each gravity arm 7,—which nose is rounded or bevelled,—projects a short distance below the under face of the wheel 4 carrying said arm, while the upper face of the arm inclines down from the level of the top flat face of the step 6 with which the arm is incorporated to a position coinciding with the bottom of the inclined rise 6^a of said step.

Assembled upon the upright motion shaft 1 beneath the smaller gear wheel 3 of the before-mentioned intermeshing gear wheels is a cam wheel 8 having one or more comparatively sharp rises 8^a on its upper face, which rise or rises is or are adapted during operation to engage with the downwardly projecting nose or noses 7^c of the gravity arm or arms 7 in the large gear wheel 4 so as to lift said arm or arms for the purpose hereinafter more fully described.

Adapted to bear by gravity, or by the combination of gravity and the effort of a suitable spring 9, upon the upper face of the larger stepped gear wheel 4 is the free end of an arm 10 which is pivoted at its other

end upon a horizontally disposed spindle or pivot 11, mounted in a suitable bracket, not shown, secured to any convenient fixed part of the frame of the machine, that end bearing upon the stepped wheel being preferably cranked or provided with a downwardly projecting nose 12. Suitably connected to this arm, advantageously near its free end, is an upwardly extending rod 13, the upper end or part of which rod is formed with a plurality of comparatively small inclined topped steps 14. This stepped portion of the rod is adapted to pass through a slot 15^a at the end of the one arm 15^b of a bell-crank lever 15, the second arm 15^c of said lever having connected thereto one or more rods 16 to which are connected one or more thread guide bars 17 for carrying the additional or patterning threads, which bar or bars extend lengthwise beneath the well of the machine Figure 4 and between the guides 22 for the usual carriages 23 carrying the bobbins for the threads that twist with the warp threads, such as are usually found in twist lace machines. Pivotaly connected to the bell-crank lever 15 is an arm 18 with bevelled nose 18^a at its free end, said nose bearing on a motion wheel 2, it being understood that an additional motion wheel is furnished in connection with each extra guide bar. The stepped portion of the rod 13 is wedged in between the one face of the slot 15^a and the end of the pivoted arm 18.

In operation, as the upright motion shaft 1 rotates, the small gear wheel 3 mounted thereon and the cam wheel 8 beneath said small gear are rotated in the same direction, and the comparatively large stepped wheel 4 carrying the gravity members 7 is simultaneously rotated in an opposite direction. The gravity members 7 and steps 6 on the larger gear wheel 4 and the rise or rises 8^a on the cam wheel 8 are so positioned relative to one another that immediately the nose portion 12 of the pivoted arm 10 which bears upon the stepped wheel arrives at the lowermost end of a pivoted gravity arm 7 appertaining to a step 6 on the wheel, the rise on the cam wheel 8 engages the downwardly projecting nose 7^c of said gravity arm 7 and rapidly lifts said arm and the pivoted arm 10 bearing upon same. This lifting movement, which is practically instantaneous, is transmitted to the before-described stepped rod 13 which is pushed up within the slot 15^a of bell-crank lever 15 so as to pivotally displace said lever and shog the extra guide bar appertaining to said lever rapidly to the extent of one gait. The number of gaits to be shogged in one direction is determined by the number of rises 6^a and pivoted gravity members 7 on the before-mentioned gear wheel 4 and the number of steps 14 on the rod 13 operating the bell-crank lever 15.

The return or opposite shogging move-

ment of the bar or bars is effected by providing the requisite number of suitably spaced and dimensioned falls 20 on the stepped gear wheel 4, said falls being perpendicular to the face of the wheel so as to effect an instantaneous movement of the bar or bars 17 under the action of suitable springs.

The mechanism above described may be somewhat modified or amplified so as to simultaneously shog a plurality of extra guide bars in different directions, and by so doing produce with the additional threads varied patterns such as squares or diamonds.

I claim:

1. In a plain net twist lace machine, a shogging mechanism for a thread guide bar, comprising a rotating stepped cam, a pivoted arm bearing upon the said cam, a stepped rod connected to said arm, and a bell crank lever one end of which is connected with the said thread guide bar and the other end of which is engaged by the stepped portion of the rod, the engagement of the stepped rod with the lever serving to shog the thread guide bar as the rod is moved by the stepped cam.

2. In a plain net twist lace machine, a shogging mechanism for a guide bar adapted to carry a pattern thread, comprising a rotating stepped cam, intermediate connections between the stepped cam and the thread guide bar by which said bar is shogged as the connections move from one step of the cam to another and supplemental means for quickly moving the engaging part of said connections from one step of the cam to another to insure rapid shogging movements.

3. In a twist lace machine, a shogging mechanism for a thread guide bar comprising a rotating stepped cam, connections engaging the cam for shogging the thread guide bar as they come into engagement with successive steps of the cam, pivoted arms located adjacent to the rises of the cam and rotatable with the cam, and means for moving the arms successively to cause them to lift the said operating connections from one step of the cam to another.

4. In a twist lace machine, a shogging mechanism for a guide bar adapted to carry a pattern thread, comprising in combination a stepped cam with rises in one section thereof and falls in another section, connections between the said cam and the thread guide bar by which the latter is shogged, means for moving the cam and causing the connections to pass from one step to the next higher in succession to shog the thread guide bar in one direction, and a spring acting on the said connections to cause them to move over the falls of the cam and cause shogging of the thread guide bar in the opposite direction.

5. In a plain net machine and in combination with the shaft carrying the ordinary

motion cams which impart shogging movements to the thread guide bars employed in forming the net fabric, of an additional shogging mechanism for a thread guide bar
 5 adapted to carry a pattern thread, comprising a stepped cam for transmitting shogging movements to the thread guide bar for the pattern thread, the cam being in the form of a curved stepped member secured to
 10 the face of a wheel in gear with the shaft carrying the motion cams, and supplemental means operated from the said shaft for causing the guide bar for the pattern thread to be rapidly shogged as successive steps of the
 15 cam come into operation.

6. The combination stated in claim 5 when the supplemental means referred to are a series of pivoted arms arranged adjacent to the rises of the stepped cam, and an additional
 20 cam on the shaft carrying the motion cams arranged to act upon and move the said pivoted arms in succession.

7. A shogging mechanism for a thread guide of a twist lace machine, comprising a
 25 rotatable wheel on the face of which is secured a stepped cam, a lever bearing on the said cam and moved as it engages with the successive steps thereof, a stepped rod carried by the lever, and a bell crank, one end
 30 of which is acted upon by the stepped rod for moving the lever and the other end of which is connected with the thread guide bar.

8. A shogging mechanism for a thread
 35 guide bar of a twist lace machine, comprising in combination a rotatable stepped cam, connections for shogging the thread guide bar bearing upon the said cam and moved thereby, pivoted elements disposed adjacent to
 40 the rises of the cam arranged to act upon the connections that shog the thread guide bar,

and means acting upon the said pivoted elements in succession to quickly lift the connection from one level of the cam to the next higher.

9. A shogging mechanism for a thread
 45 guide bar of a twist lace machine, comprising in combination a rotatable stepped cam having in one portion a series of rises and in another portion a series of falls, connections for shogging the thread guide bar
 50 bearing upon the said cam and moved thereby, pivoted elements disposed adjacent to the rises of the cam arranged to act upon the connections that shog the thread guide bar,
 55 means acting upon the said pivoted elements in succession to quickly lift the connection from one level of the cam to the next higher, and a spring for holding the connections against the cam arranged to cause the con-
 60 nections to descend the falls of the cam in succession.

10. In a shogging mechanism for a twist lace machine, the combination of a shaft, the
 65 ordinary motion cams carried thereby, a gear wheel of small size also carried thereby, a gear wheel of larger size driven from the small gear wheel, a curved stepped cam secured to the face of the large gear wheel,
 70 connections for shogging a bar adapted to guide a pattern thread, a set of levers pivotally supported upon the large gear wheel and arranged respectively adjacent to the rises of the stepped cam, and a cam on the
 75 shaft carrying the ordinary motion cams and the small gear wheel arranged to act upon the pivoted levers carried by the large wheel in succession, and cause them to quickly lift the shogging connections for the
 80 thread guide bar from one level of the cam to the next higher in succession.

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