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SELVAGE THREAD FEEDING MEANS FOR LOOMS

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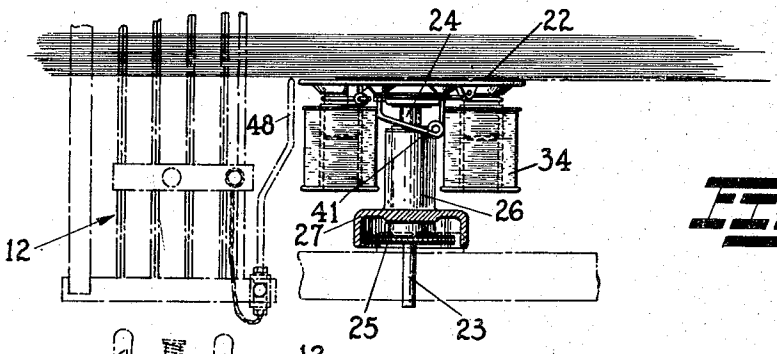


FIG. 2

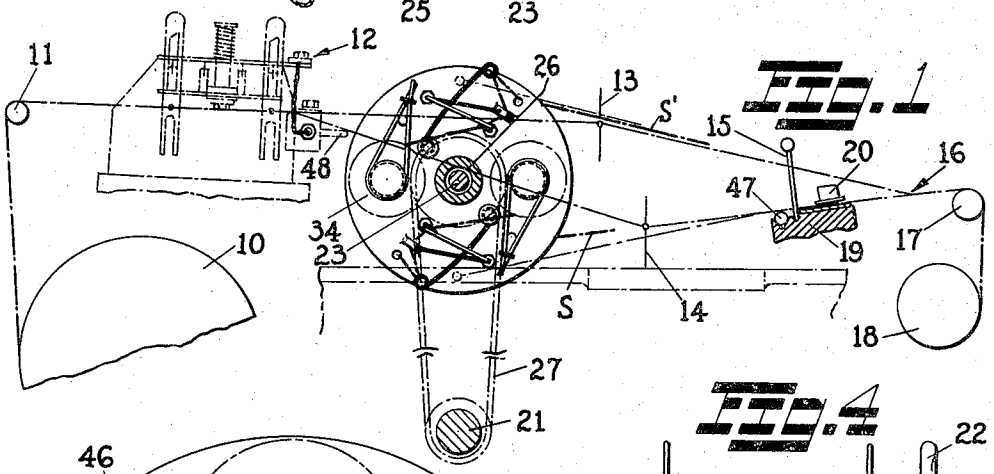


FIG. 1

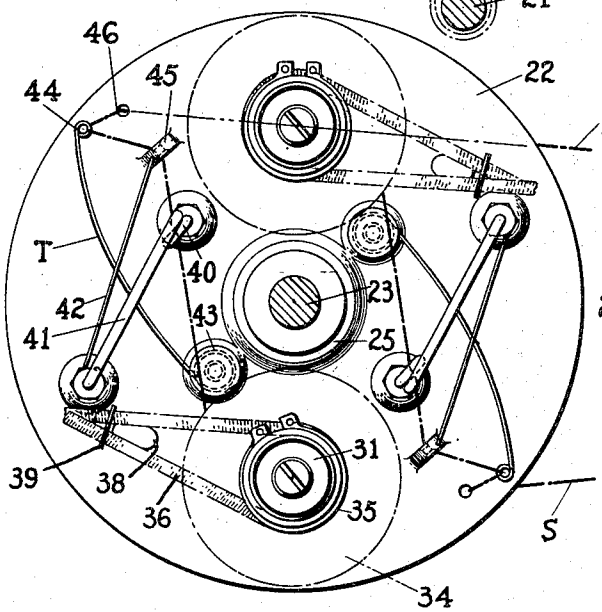


FIG. 3

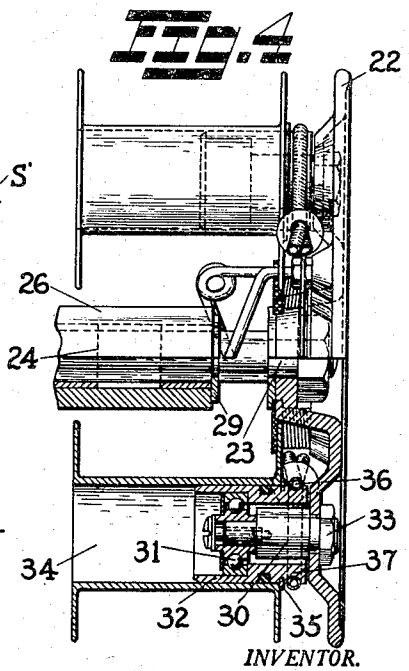


FIG. 4

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SELVAGE THREAD FEEDING MEANS FOR LOOMS

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This invention relates to looms for weaving and more particularly, to improvements in mechanism for producing a so-called twisted or leno type selvage and to the looms of which that mechanism is a part.

It is a general object of the invention to reduce the cost of leno selvage mechanisms and to simplify them without in any way detracting from the quality of selvage formed or the efficacy with which the device performs its intended function.

It is a more specific object to devise a simple concentric means rotating once for every two picks and at a continuous and uniform rate, but which will feed and twist the selvage threads together as they are shed so there shall be no interference with the filling inserting means.

It is a further object to accomplish the results above noted without resort to special drive means such as have been considered essential heretofore, even in cases where the shed has been changed only at each second pick.

Other objects of the invention will become apparent from the following more detailed disclosure.

In looms wherein filling is not interwoven with warp threads as in fly shuttle looms to form normal selvages at both sides of the fabric, it is common practice to form a twisted or leno selvage which may be accomplished by feeding and shedding two selvage threads by a means which twists them together at each or spaced shed changes. These devices usually perform in such a way that the two threads are intermittently moved as in harness mechanisms. The timing approximates that of the main harness or shedding function so that the filling inserting means may not be in any way affected by the presence of the selvage threads which are preferably fairly heavy or strong. In the prior art, e. g., United States Patent 2,399,880, rather complicated driving means have been employed such as Geneva motions and the like.

Other schemes have involved disks which have had gear teeth cut in their peripheries and which have been driven by an intricate gear system. The thread supplies have been carried by other means and have had to be separately rotated to avoid putting twist in the individual threads. Such devices have been costly and very complicated.

According to the present invention a very simple means rotating on a single axis and driven by a chain or by gears carries a single disk serving to feed and to carry supplies of selvage thread. One of the main reasons for intermittent drives has been the fact that in practical usage, the selvage threads fed by a rotating element have affected the travel of the filling inserting means unless intermittently rotated as by a Geneva motion. To avoid that, the loom lay has been provided at the back of the reed with a special polished rod or similar means to define the plane of elevation of the lowermost warp threads as they form an open shed. The feeding disk having eyelets for feeding the selvage threads is so centered and the radial distance of the eyelets from

the center of rotation such that for about the amount of time in the cycle during which the filling inserting means is in the shed, the lowermost selvage thread feeding eyelet will be below a line from the fell of the cloth over the said polished rod or the like and extended toward the eyelet. That assures that the selvage thread will then be aligned with the remainder of the warp threads in the lower part of the shed while the inserting means is active.

The top selvage thread may be in general alignment with the top part of the shed but need not be specially dealt with since the lifting of the inserting means is prohibited, but added tendency to hold it down would make little difference.

The invention will be described in greater detail by reference to one specific embodiment thereof as illustrated in the accompanying figures of drawing wherein:

Fig. 1 is a schematic showing of a loom to which the invention has been applied.

Fig. 2 is a plan view of part of the mechanism of Fig. 1.

Fig. 3 is a view to an enlarged scale of part of the selvage thread feeding means.

Fig. 4 is a view, partly in section, further illustrating the selvage thread feeding means.

Now referring to Figs. 1 and 2, parts of a loom are shown schematically, these including warp beam **10**, whip roll **11** over which the warp threads are passed as they are lead through warp stop motion **12**, heddles **13** and **14** and reed **15**. Fabric formed at the usual fell line **16** passes over take up roll **17** and is wound up at **18**. Reed **15** is held in lay **19** along which functions filling inserting means **20** of such nature as to introduce into the shed formed by warp threads, cut lengths of filling the ends of which protrude at at least one side of the fabric.

Lay **19** is attached to swinging swords or in some other way is adapted to be reciprocated to and fro to beat the filling toward the fell once at each pick. In a preferred instance, the lay is caused to dwell while filling is inserted and is operated by cams to effect the beating function as in United States Patent 2,624,372. In this type of loom a cam shaft **21** is positively rotated and carries those cams which affect the beating and other functions.

Means for feeding the selvage threads, also shown to larger scale in Figs. 3 and 4, includes disk **22** fixed at the end of a shaft **23** axially held in a sleeve **24**. This sleeve has at its outer end a sprocket **25** the hub of which is set screwed through sleeve **24** to a flattened side of the shaft **23**. Sleeve **24** is rotatable in bushings in bearing bracket **26** which has an enlarged projecting flange for the sprocket and chain **27**, the latter running over and being driven by a sprocket **28** fixed to shaft **21**. The shaft **23** may be moved to or from the selvage of a fabric being woven for adjustment purposes, i. e., when changing width of fabric being woven. The sleeve **24** is restrained axially by the sprocket at one end and by a snap ring **29** at the other. The set screw bearing as it does against the shaft **23** which does not rotate in sleeve **24** cannot cause any burring of the shaft which may affect the bearing between the sleeve **24** and bearing **26**.

Disk **22** carries at diametrically opposite points studs **30** at the ends of which are mounted antifriction bearings **31** adapted to have pressed thereon bobbin holding sleeves **32**. The latter are first pushed over the bearings until they are stopped by the engagement of a shoulder against the bearing. Then the stud is inserted in a hole in the disk and secured in place by a nut **33**. A spool **34** may be pushed on sleeve **32** and should be a fairly close fit thereon, but is actually held against coming off or against rotation thereon by a rubber O-ring in a groove in the

sleeve. The spool is pushed on until it abuts against a snap ring 35 or other axial stop.

To provide for the selvage thread on spool 34 being drawn off under tension, a coil spring 36 has engagement with a groove in the hub end 37 and is held oppositely at a lug 38 at which the spring ends are clipped together by a clamp 39. The latter may be readjusted to shorten or to lengthen the spring and thereby add or detract from the braking effect it may exert on the spool.

Thread drawn off a spool is first passed through an eye 40 formed in a bent wire guard 41. This guard attaches at each end to disk 22 and in addition to providing an eye for the thread, restrains a second wire rod 42 which limits the movement of a spring take-up arm T. This last mentioned arm is coiled about an anchorage at 43 and is bent into an eyelet at 44 at its free end. A lug 45 is drilled to provide a second eye through which the thread passes before being threaded through eyelet 44, whence it is passed through feeding eye 46 in the disk. The wire rod 42 is also anchored at one end in this lug. From this eye 46 the thread passes to the fell of the cloth, but is especially guided as will be explained more fully. These threads pass through a single dent space in the reed and over a polished rod 47 which determines the height at which the warp sheet may lie when the harnesses are in lowermost position. Actually the fell, the top of the lay 19 and top of rod 47 are about in line with the eyes of heddles 14 when that harness is in its lowermost position.

It is to be understood that disk 22 carries two spools and two eyelets and that although one only has been described in detail, the two units are duplicates and symmetrically disposed.

While the spring wire guides 42 have been described as take-up means, they also serve when a selvage thread breaks or becomes unduly slack to stop the loom as they spring out and make a contact with wire rod 48 connected as a part of the warp stop mechanism of the loom.

The center upon which the shaft 23 is mounted to rotate is to the rear of the harnesses so there will be no interference between the disk and harnesses and is more or less centralized between the upper and lower limits of travel of the warp threads. It should be borne in mind that in order to keep centrifugal forces down, the diameter of the disk and radial distance of parts thereon from the center are kept as small as practicable. If the selvage threads were to move no farther than the warp threads so that the angle they make as they diverge back from the fell was the same at widest separation, then the filling inserting means would be affected by these threads at the end of the shed. Since the disk rotates continuously at uniform rate, there is no possibility of dwell as in those mechanisms driven intermittently, e. g., by a Geneva motion. The lower warp threads must lie on the lay and rod 47 when the filling inserting means enters the shed and almost until it has been withdrawn. The timing of the rotation of the disk assures that as the lower shed is raised just as the inserter is withdrawn, the selvage thread will be no higher than the main warp. The upper shed drops rapidly and is in contact with the inserter at that time. Any influence by the selvage thread alone tending to raise the inserter will cause it to take an erratic path and eventually cause trouble, especially at higher speeds.

The center of shaft 23 is preferably a little below the center of the angle made by the divergent warp sheets at the shed and the radial distance of apertures 46 from the shaft center such that at the bottom, a selvage thread S is bent over rod 47 and remains below the level established by that rod from a point in the cycle slightly ahead of the entry of the filling inserter until about the time of withdrawal thereof. As shown in Fig. 1, this amounts to something over 100° of arc for the disk itself and since the disk makes one revolution every two picks, that means that there is no interference for over 200° of the loom cycle. Thus there is provided ample time in which the inserting means may be within the shed, but not affected adversely by the selvage threads. The device is very simple and inexpensive since a direct chain or gear drive is far less costly than a Geneva movement. Timing is easily effected by setting the disk ahead or back to provide for the lower selvage thread being in contact with rod 47 just before the inserting means enters the shed and so that it will not be raised from the rod until after the said means has been withdrawn. To gain more time the center of shaft 23 is lowered. However, the setting is one which should be fairly close so as to keep the upper selvage thread S' as high as practicable. The fact that it may bear upon the top of the inserter does not give rise to any serious difficulty since the warp generally closes into contact at the top just before the inserting means is withdrawn anyway.

Mention has been made of selvage threads and it is to be understood that two single threads may be employed or that a plurality of threads, e. g., two, three or more may be combined in winding on and withdrawn from the spools in the same way.

The rod 47 is preferably of a hard, resilient and shock resistant glass, but may be of other materials so long as it is fairly light and resistant to abrasion or wear as the threads pass over it.

The fact that for the first time the selvage thread supplies have been mounted directly on the disk makes it no longer necessary to rotate them specially for the purpose of preventing twist where not desired. The threading is very direct and simple it being necessary to pass the threads through no tubes and their travel for so short a distance minimizes the effects of lint and simplifies all adjustments as well as conserving space on the loom. The stop motion is very direct and the take-up action effective.

All adjustments are easily made, but there can be only a few since the rotation is at a fixed ratio and the change of position of the disk on the shaft, accomplished by loosening a nut and effecting the desired angular adjustment, is about the only setting which might be at all critical.

While one embodiment of the invention has been disclosed, it is to be understood that the inventive concept may be carried out in a number of ways. This invention is, therefore, not to be limited to the precise details described, but is intended to embrace all variations and modifications thereof falling within the spirit of the invention and the scope of the claims.

I claim:

1. In combination in a loom for weaving, a lay and reed, heddles through which warp threads are guided, a warp thread elevation defining means carried by the lay and a means for feeding selvage threads along with said warp threads to bind in ends of filling threads during weaving, said means for feeding selvage threads comprising a concentrically disposed shaft, feeding disk and means rotatable therewith for carrying supplies of selvage threads, means for rotating said feeding means at a constant rate to change the position of the selvage threads once for each course woven, said disk having selvage thread feeding guides through which the threads are fed, the disk center and distance of the said guides being so positioned and radially spaced that throughout an angle of movement for the disk substantially equal to the time required to insert a pick of filling the lowermost selvage thread as it extends from the fell of the cloth to its guide in said disk is held in contact with said warp thread elevation defining means at the lay.

2. In combination in a loom for weaving, a lay and reed, heddles through which warp threads are guided, a warp thread elevation defining means carried by the lay and a means for feeding selvage threads along with said warp threads to bind in ends of filling threads during weaving, said means for feeding selvage threads com-

prising a shaft, means in which said shaft is rotated and a feeding disk carried at one end of said shaft and rotatable therewith, means on said disk for carrying supplies of selvage threads, means for rotating said shaft and disk at a constant rate to change the position of the selvage threads to reverse their position once for each course woven, guides in said disk through which the selvage threads are fed, the position of said shaft and radial separation of the guides therefrom being such in relation to the plane of the warp threads and elevation defining means therefor at the lay that throughout an angle of movement of the disk slightly greater than the time required to insert a pick of filling, the lowermost selvage thread as it extends from the fell of the cloth to its guide in said disk is held in contact with said warp thread elevation defining means at the lay.

3. Mechanism as defined in claim 2 wherein said shaft which carries said disk is adjustable to and from the selvage of the fabric being woven.

4. Mechanism as defined in claim 2 wherein said disk and supplies of selvage threads are adjustable angularly on said driving shaft thereby to vary the timing of the shedding of the selvage threads.

5. Mechanism as defined in claim 2 wherein said warp thread elevation defining means is comprised as a polished rod fixed on the lay adjacent the reed and having its thread engaged surface at substantially the level of that part of the lay over which filling inserting means is moved.

6. Mechanism as defined in claim 2 wherein said shaft to which the disk is fixed is axially adjustable within a sleeve rotatable in a bearing and means for rotating the disk includes a chain running over a sprocket fixed to said sleeve.

7. In combination in a loom for weaving, a lay and reed, heddles through which warp threads are guided, a warp thread elevation defining means comprising a glass rod carried by the lay at the rear of the reed and means for feeding selvage threads along with said warp threads to bind in the ends of filling threads during weaving, said means for feeding selvage threads comprising a bracket and bearing forming a part thereof, a sleeve rotatable in said bearing and means for driving said sleeve at a uniform rate, a shaft axially adjustable in and fixed for rotation with said sleeve, a disk fixed at the end of said shaft adjacent the edge of a warp sheet in the loom, supplies of selvage threads carried by said disk and eyelets in the disk through which selvage threads are fed, said shaft being so positioned and the eyelets radially spaced from the shaft so that as the disk is rotated for an angular distance slightly greater than the distance it would rotate during entry and withdrawal of filling inserting means from the shed, the lowermost selvage thread as it extends from the fell of the cloth to its eyelet in the disk is held in contact with said glass rod.

No references cited.