March 8, 1955 G. T. ALLENSON 2,703,587

SELVAGE THREAD FEEDING MEANS FOR LOOMS

Filed Oct. 19, 1953 2 Sheets-Sheet 1

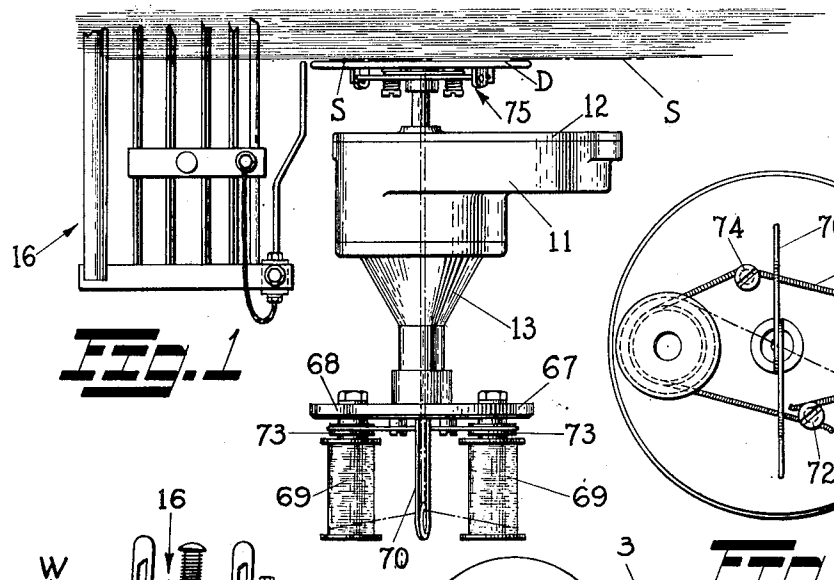


Fig. 1

Fig. 5

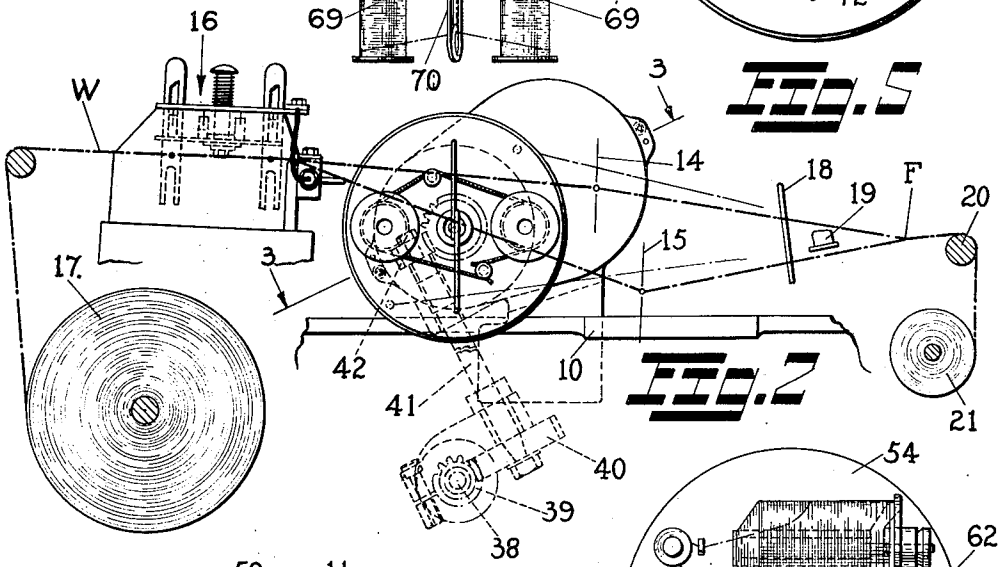


Fig. 2

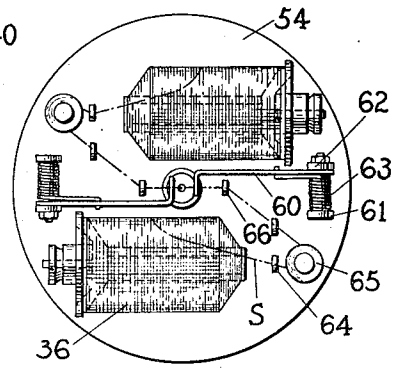


Fig. 4

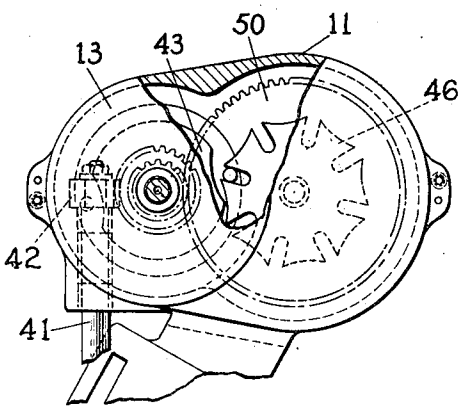


Fig. 6

INVENTOR.
GEORGE T. ALLENSON

BY Rodney C. Southwood

ATTORNEY

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SELVAGE THREAD FEEDING MEANS FOR LOOMS

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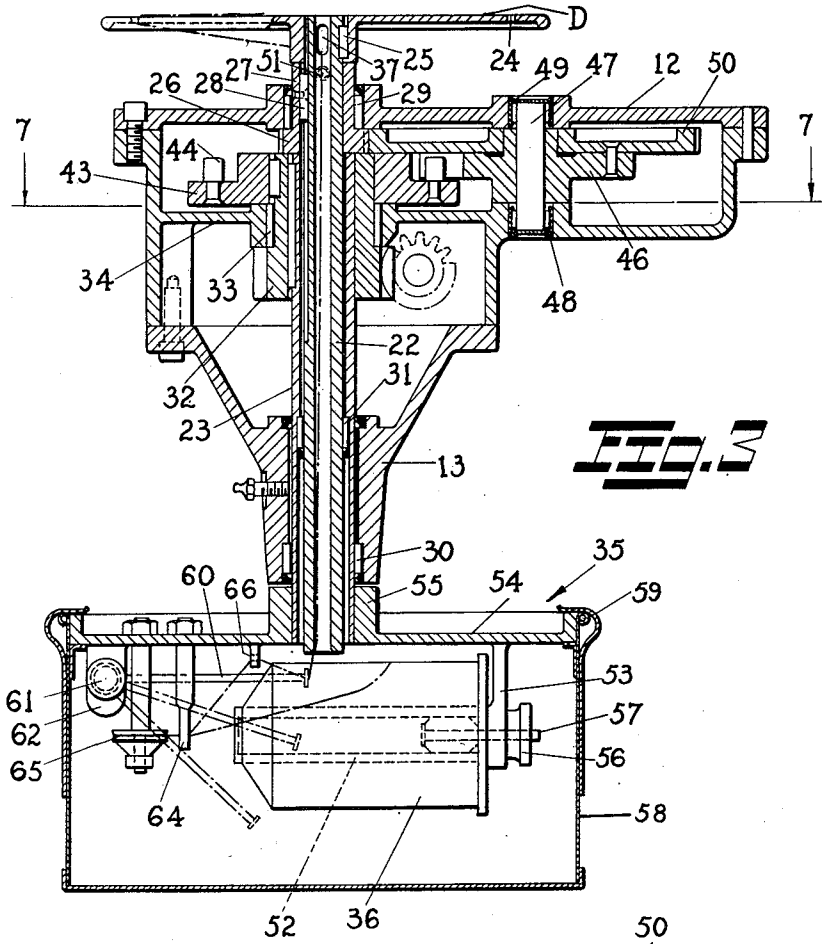


FIG. 3

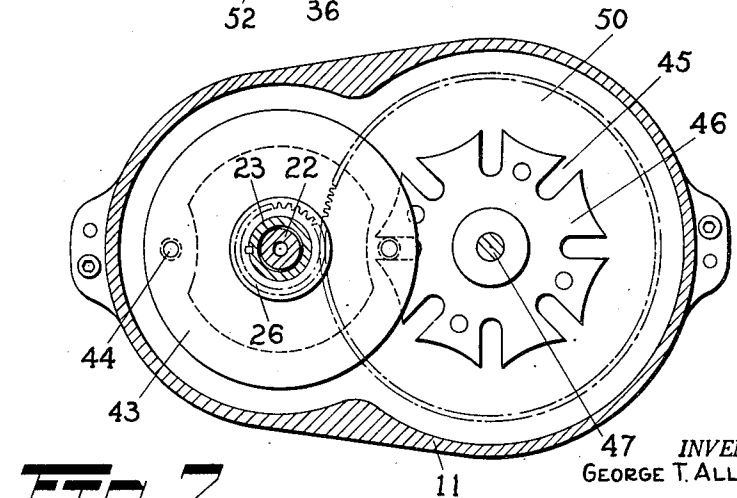


FIG. 7

INVENTOR.
GEORGE T. ALLENSON

BY

Rodney C. Southworth

ATTORNEY

United States Patent Office

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SELVAGE THREAD FEEDING MEANS FOR LOOMS

George T. Allenson, Lincoln, R. I., assignor to Draper Corporation, Hopedale, Mass., a corporation of Maine

Application October 19, 1953, Serial No. 386,881

9 Claims. (Cl. 139—54)

This invention pertains to looms in which the natural weaving function does not result in giving a selvage at either or both sides of the fabric, and more particularly, to means for use in such looms which will produce a so-called, twisted or leno type selvage.

It is a general object of the invention to devise a compact and effective, unitary mechanism for easy application to a loom of the type described which shall mount and feed a pair, at least, of selvage threads and to shed them as required to make a suitable leno type selvage.

It is a more particular object to devise a selvage thread feeding means and driving mechanism of which is largely enclosed and in which a selvage thread supply and a feeding disk or other means are concentrically mounted for rotation, the former at a uniform speed while the latter is intermittently advanced and then held stationary.

It is a further object to devise a selvage thread feeding and shedding means which shall maintain a constant prescribed tension on the threads and which will prevent them from twisting or in any other manner feeding improperly.

Another object is that of providing a simple mechanism for performing a function which has heretofore required a device having great multiplicity of parts and complication.

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

In looms of the type described in United States Patent No. 2,604,123, a selvage of twisted or leno type is frequently employed at one side, at least, of the fabric to bind in the projecting ends of cut filling so that the fabric may present a reasonably secure edge to resist the action of various elements forming a part of the finishing machinery in which the fabric is processed. These selvage threads are fed from spools or other supplies and by an intermittently rotating disk or similar means, they are shed as presented at the fabric edge so that at periodic intervals an end or ends of filling will be bound in by the threads which are actually twisted one over the other or given a sort of leno twist to lock the ends as securely as is possible during weaving. In most instances where such threads have been used, they they have been supported at or adjacent the regular warp beam and passed through a leno motion of some sort after being threaded through the usual warp stop motion, note United States Patent No. 2,399,880. Thus the supplies and the feeding and shedding means are widely separated and require independent driving means so that a great multiplicity of parts requiring more space and attention are to be provided.

According to the instant invention, a unit mounted conveniently and not too far from the fell of the cloth is driven by a single drive shaft and gear train and this unit houses and supports the entire means necessary to the selvage producing function. A casing is mounted on a convenient part of the loom adjacent the harnesses and mechanism housed therein is driven from the main camshaft of the loom. This unit provides bearings in which may rotate two concentric shafts to the end of one of which is fixed the feeding and shedding means, and to the other of which is attached the mechanism for housing and supporting the thread supply spools. The first shaft is rotated intermittently while the second is continuously rotated. However, the two shafts and parts carried thereby make an equal number of rotations in a given time so that the selvage threads, threaded through the hollow center of the inner shaft do not become

twisted upon themselves. The intermittently rotated feeding and shedding means is so timed as to change as the regular shed is changed, but preferably only one-half as often, thus binding in two filling ends, then reversing the shed and at the same time effecting a leno type twist in the binding threads.

The invention will be described in greater detail hereinafter by reference to the accompanying figures of drawing, wherein:

Fig. 1 is a plan view showing the mechanism as applied to a loom.

Fig. 2 is a diagrammatic view showing in elevation the path of warp threads through the loom, general arrangement of pertinent parts thereof and the selvage thread feeding and shedding means and its drive from one of the loom shafts..

Fig. 3 is a section taken through the selvage thread handling means showing the arrangement of supporting and driving parts therefor.

Fig. 4 is a detail view showing one manner in which the supplies of selvage threads may be supported for rotation.

Fig. 5 is a similar view showing another arrangement for the selvage threads.

Fig. 6 is a detail view, partly in section, showing the intermittent drive for the selvage thread shedding means.

Fig. 7 is a sectional view showing certain parts of Fig. 6 to an enlarged scale.

Now referring to Figs. 1, 2 and 3, the mechanism which comprises a compact unitary device is applied at one side of the loom being attached thereto as shown in Fig. 2 by being bolted or otherwise fixed to one of the loomsides **10** of that loom and comprising a central casing member **11**, a cover **12** at one end and an extending casing part **13** bolted to the opposite end of said central casing member, there being a suitable pad or other means formed as a part of the casing by means of which it may be attached to the loomsides, or if desired, to some extending or other part attached thereto. The general disposal of the mechanism is at the rear of shedding means which would include harnesses having heddles therein indicated more or less diagrammatically at **14** and **15**, Fig. 2, and forwardly of a warp stop motion **16**, the latter being of a type either mechanical or electrical, the details of which are well known to those skilled in this art. Warp threads comprising a warp sheet W are withdrawn from a beam **17** at the rear of the loom and after passing through the warp stop motion are threaded through the heddles and then through the reed merely indicated diagrammatically at **18** after which they pass forwardly to the fell of the fabric F. Weft inserting means **19** preferably such as that described and shown in the patent above cited may be employed to introduce weft threads in the form of "hairpins" and thereby serve in interlacing the necessary warp and filling incidental to the fabric forming function. The fabric then passes over certain take-up means comprising a roll **20** and may be wound on a fabric roll **21** as is more or less the common practice.

The casing member houses certain mechanism including an inner tubular shaft **22** and outer tubular shaft **23**. The inner shaft **22** carries at the end adjacent the loomside and, of course, adjacent the warp sheet, a feeding means which takes the form of a disk D having apertures such as **24** therein through which the selvage threads are threaded. These threads, two in number, are indicated by the letters S at Fig. 1, and after passing through the disk are threaded through the reed **18** and actually are disposed more or less in parallelism with the other warp threads, although, at all times, they do not move in exact parallelism or exactly at the same times as the warp threads, but do move substantially with them.

The disk D is fixed to the end of the hollow shaft **22** by a key **25**, or in any other satisfactory manner, and also has fixed thereto at that end a pinion **26** having elongated hub **27** within which is fixed a key **28** which is adapted to slide in an elongated keyway in the shaft **22** since, as the width of the fabric woven is varied, the disk may be positioned adjacent the warp by extending or retracting this spindle as required. It is held in a

set position by means of a set screw or locking screw, or in any other satisfactory manner. The hub 27 of the pinion is adapted to rotate in a bushing or other bearing 29 which is set in the centrally disposed hub of the casing cover 12.

The outer tubular shaft 23 is carried within a needle bearing 30 which is held within a suitable recess at the end of the casing extension 13, a second needle bearing being interposed between this shaft and the inner shaft 22 at a position such that as the shaft and disk D are extended for different widths of fabric, the bearing will always guide the end of the inner shaft. The outer shaft 23 is keyed at its inner end to a spiral gear 32 which has an elongated hub carried in or borne in a bushing 33 at a central web portion 34 of the main casing member and this bearing 33 actually positions the gear 32 and also the end of the outer spindle borne at its opposite end by needle bearing 30. The outer spindle then has fixed at its projecting end a member generally designated by numeral 35 which is rotated with the outer spindle and in which are mounted supplies 36 of selvage threads which are then threaded through the hollow interior of spindle 22 and outwardly through slots 37 in that spindle and in the hub of the disk D to be passed through the eyelets 24 in the disk and thence on to the fell of the fabric.

The outer spindle is positively driven as illustrated in Figs. 2 and 3 through certain gearing which takes off a camshaft 38 or other convenient driven shaft at the loom, and through spiral gears 39 and 40, shaft 41, and another spiral gear 42 on the upper end thereof which is in mesh with the gear 32, drives it and other parts that will presently be described. Since the gear 32 is keyed to the shaft 23, the latter and also the supplies of selvage threads are uniformly rotated at a prescribed speed.

The disk D is to be rotated intermittently and that is accomplished by means of other gears and a Geneva movement also housed within the casing Fig. 3. The elongated hub of the gear 32 has keyed thereto an indexing disk 43 having a plurality of pins 44 depending upon the number of intermittent movements of the disk required for a certain repetition of the weaving cycle, for example, the disk preferably should make a complete revolution for every four courses of the weaving cycle, but it is to be understood that other arrangements may be used, that is, either more or fewer changes of the shed for the selvage threads being effected for a particular number of picks of filling inserted. The pins 44 of the Geneva movement engage within notches or slots 45 of the Geneva wheel 46 which is rotatable on a spindle 47 carried in suitable needle or other bearings 48 and 49. This Geneva wheel has riveted or otherwise attached thereto a gear 50 which meshes with the pinion 26 before mentioned and which is, of course, keyed to the inner shaft 22 so as to drive it and the disk D. The gear ratios as well as the number of pins 44 and slots 45 in the Geneva wheel are so chosen that the disk D makes two movements of 180° every time the selvage thread carrier 35 rotates a complete revolution, and the two shedding movements are made once for each four picks so that there are two projecting ends of filling bound in each time the selvage threads are crossed and twisted.

The disk D and inner tubular shaft 22 may be extended outwardly of the casing, and to that end, the shaft is provided with an elongated keyway in which the key 28 may slide, the latter being riveted or otherwise fixed to the elongated hub of the pinion 26. Thus the spindle and disk are driven no matter what the position thereof may be and, of course, that position is set so that the disk as shown in Fig. 1 may operate very close to the end of the warp sheet, that position being maintained as adjusted by a set screw 51 or other locking means.

As shown in Figs. 3 and 4, the supplies 36 of the selvage threads are wound on cardboard or other tubular cores 52 and are held in place on bracket 53 which may be integral or otherwise attached to a disk 54 which is a part of the supporting and enclosing structure 35, said disk having a hub 55 which is fixed at the end of the outer tubular shaft 23. These supplies may be held in place in a convenient manner, for example, by a locking nut 56 which is threaded to an elongated bolt or the like 57 the head of which engages within some part of the core or spool on which the selvage thread is wound to maintain it in position. According to this form of the invention a casing of plastic, metal or other material being designated by numeral 58 is held in place by detents such as those at 59 thereby to be quickly attached and detached.

As shown more clearly in Fig. 4, a pair of tension arms one of which is shown at 60 serve to take back or maintain in a taut condition the selvage thread as it is drawn from the supplies and fed onwardly to serve its purpose in locking in the projecting ends of filling. The arm 60 is swingable on a pivot 61 fixed in lug 62 and is urged in a direction to move the arm against the tension in the thread by means of a coil or other spring 63. The thread S is drawn off the supply 36 and is passed through a guide 64 then through a tension means 65 which may take the form of spring pressed disk tensions or may be of other type, and is then passed through a second guide 66, then through the end of the tension take-up arm 60 and into the central hollow portion of the inner shaft 22. The opposite supply is identical as are its thread guide means, tension and take-up members through which that selvage thread is passed and these members are merely oppositely directed for convenience and general symmetry of design leading to balance and a disposal of the parts so that they are affected as little as possible by the centrifugal force resulting from their rotation.

Now referring to Figs. 1 and 5, a modification of selvage thread supporting and tensioning means is illustrated in which a disk 67 is attached to the end of the shaft 23 and this carries spindles or other means 68, diametrically opposed, upon which supplies 69 are rotatably supported. These supplies are wound on spools having end flanges so that the material is drawn therefrom tangentially rather than over the end of the package and the threads are then passed through a central guiding means 70 which is in effect an extension of the inner shaft and which is adapted to conduct the selvage threads into that shaft as illustrated in Fig. 1. This modification of the invention is simpler and the rotation of the spools on which the supplies of selvage threads are wound is resisted by a coil spring 71 the ends of which are fixed at 72 and which are passed about grooved disks or sheaves 73, one for each spool, and over a guide 74 more or less opposed to the post 72 in which the ends are clamped or otherwise fixed. This spring member 71 is under sufficient tension so that it tends to resist rotation of the supplies since the spools are interconnected to the sheaves 73 and thus the threads are drawn and are fed under a more or less uniform and suitable tension which may be adjusted by shortening or lengthening spring 71.

In operation, the driving means geared to cam or other shaft 38 rotates gear 32 continuously. This, in turn, rotates outer shaft 23 and indexing disk 43 so that the selvage thread supplies are revolved as a unit about their rotative center. The lugs 44 on the indexing disk engage the notches in the Geneva wheel 46 and rotate it one-eighth of a turn for each lug, that is, two notches every time shaft 23 rotates once. Gear 50 transmits the periodic movements of the Geneva wheel to shaft 22 through pinion 26, the gear ratio being such that the disk D makes a full turn every time the supplies do, but by intermittent movements interrupted by periods of dwell at which time the shed formed by threads S is stationary to permit insertion of filling. The threads S are drawn off under a prescribed tension and are maintained taut and are taken up or drawn back by means such as the arms 60 or in the case of the modification of Fig. 1, by certain spring take-up means at disk D indicated by numeral 75. These may also be a part of a stop motion as described in co-pending patent application Serial No. 377,013, filed August 28, 1953.

The particular arrangement of parts herein given by way of example is designed to give a change of shed every two picks, thus resulting in a crossing and leno twist in the selvage threads S with two filling ends bound in every time the unit makes a half turn. Of course, a crossing may be made at every pick or at less frequent intervals.

Adjustment or timing of the action is effected by loosening gear 40 on the tapered end of shaft 41, turning the mechanism to the desired point and then tightening the gear in place. The taper is such that when once drawn up, the gear is held effectively against any tendency to turn, the actual load of driving not being excessive.

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. A selvage thread feeding means for looms which comprises a support, aligned bearings forming a part of said support, a selvage thread supply and a selvage thread feeding means and plural means rotatively carried in said bearings and concentrically disposed, to one of which means said supply of selvage threads is fixed and to another of which said feeding means is attached, and means for synchronously rotating both supply and feeding means, said means being adapted to rotate the latter intermittently.

2. A selvage thread feeding means for looms which comprises a casing, bearings at each end of said casing, a selvage thread supply and a selvage thread feeding means rotatable in said bearings and concentrically disposed for rotatively supporting said supply and feeding means, and other means enclosed within said casing for rotating said supply at a uniform rate and for rotating said feeding means synchronously therewith but intermittently.

3. A selvage thread feeding means for looms which comprises a support, aligned bearings in said support, a selvage thread supply and a selvage thread feeding means and concentric shafts rotatively carried in said bearings, means by which said selvage thread supply is carried at the end of one said shaft, other means fixing said feeding means at an end of the other shaft and means for continuously rotating said shaft to which the supply is attached and other means operative to rotate the shaft carrying the feeding means intermittently.

4. A selvage thread feeding means for looms which comprises a support, aligned bearings in said support, a selvage thread supply and a selvage thread feeding means and concentric shafts rotatively carried in said bearings, means by which said selvage thread supply is carried at the end of one said shaft, other means fixing said feeding means at an end of the other shaft and means for continuously rotating said shaft to which the supply is attached and other means operative to rotate the shaft carrying the feeding means intermittently, said shaft carrying the selvage thread feeding means being extendible for positioning the feeding means adjacent the warp sheet at the loom without affecting the intermittent rotation of said shaft.

5. A selvage thread feeding means for looms which comprises a supporting casing, aligned bearings in said casing, concentric shafts rotatively supported in said bearings, a selvage thread supporting and tensioning means fixed at the end of one of said shafts, a disk fixed to the opposite end of the other of said shafts and having selvage thread guiding means adjacent its periphery through which said selvage threads are passed, means for rotating that shaft to which said supplies are fixed at a uniform rate and means for rotating the shaft carrying said disk from the first, but with an intermittent motion.

6. A selvage thread feeding means for looms which comprises a supporting casing, aligned bearings in said casing, concentric shafts rotatively supported in said bearings, a selvage thread supporting and tensioning means fixed at the end of one of said shafts, a disk fixed to the opposite end of the other of said shafts and having selvage thread guiding means adjacent its periphery through which said selvage threads are passed, means for rotating that shaft to which said supplies are fixed at a uniform rate and means which comprises a Geneva motion for rotating the shaft carrying said disk from the first shaft and with an intermittent movement.

7. A selvage thread feeding means for looms which comprises a supporting casing, aligned bearings carried in said casing, an outer tubular shaft rotatable in certain ones of said bearings and an inner tubular shaft borne in others of said bearings and within said outer shaft, a selvage thread feeding and shedding disk fixed to a projecting end of said inner shaft and a support for selvage thread supplies fixed to the opposite end of the outer shaft, means for rotating the outer shaft at a uniform rate and a drive means from the outer to the inner shaft which includes a Geneva movement and a gear train.

8. A selvage thread feeding means for looms which comprises a supporting casing, aligned bearings carried in said casing, an outer tubular shaft rotatable in certain ones of said bearings and an inner tubular shaft borne in others of said bearings and within said outer shaft, a selvage thread feeding and shedding disk fixed to a projecting end of said inner shaft and a support for selvage thread supplies fixed to the opposite end of the outer shaft, and a gear train from a rotating part of said loom to said outer shaft for rotating it at a uniform rate, an indexing disk of a Geneva movement fixed for rotation with said outer shaft and means for intermittently rotating the inner shaft therefrom which comprises a Geneva wheel cooperating with said indexing disk and a gear and pinion said gear being rotatable by said wheel and meshing with the pinion, said pinion being in driving engagement with the inner shaft.

9. A selvage thread feeding means for looms which comprises a supporting casing, aligned bearings carried in said casing, an outer tubular shaft rotatable in certain ones of said bearings and an inner tubular shaft borne in others of said bearings and within said outer shaft, a selvage thread feeding and shedding disk fixed to a projecting end of said inner shaft and a support for selvage thread supplies fixed to the opposite end of the outer shaft, and a gear train from a rotating part of said loom to said outer shaft for rotating it at a uniform rate, an indexing disk of a Geneva movement fixed for rotation with said outer shaft and means for intermittently rotating the inner shaft therefrom which comprises a Geneva wheel cooperating with said indexing disk and a gear and pinion said gear being rotatable by said wheel and meshing with the pinion, said pinion being in driving engagement with said inner shaft by a means restricting relative rotation but permitting sliding movement of the shaft.

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