

March 23, 1965

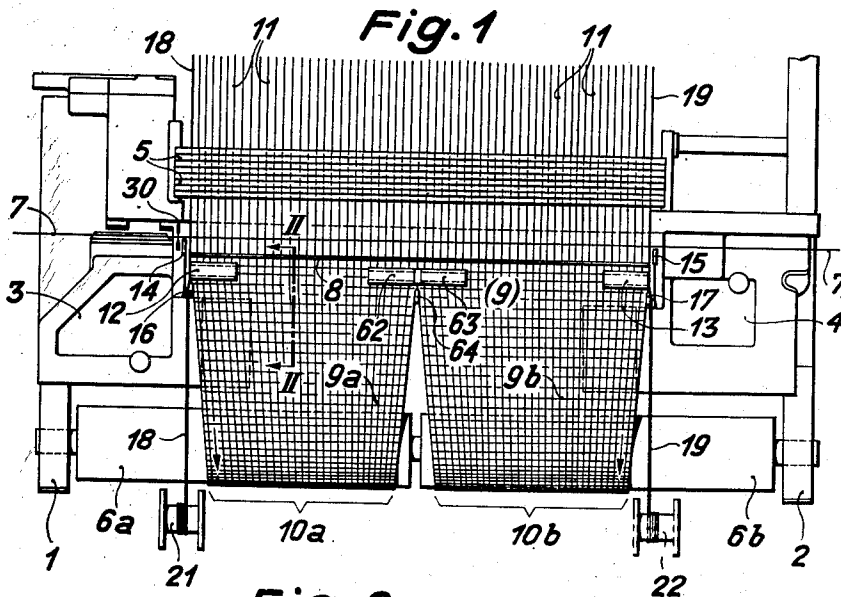
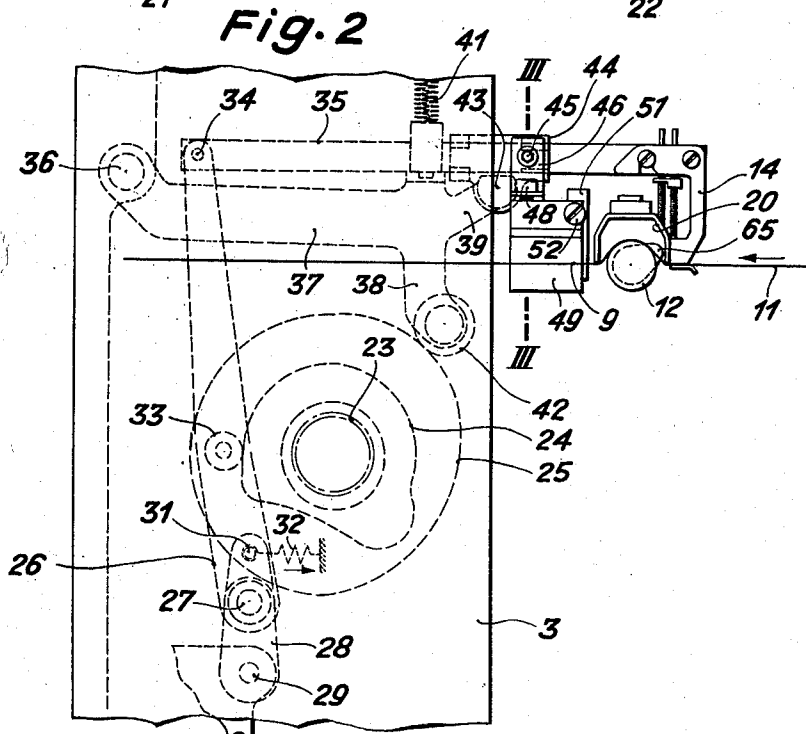
P. LÜBER

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FABRIC CONTROL AND SEVERING MEANS FOR A LOOM

Filed Aug. 12, 1963

2 Sheets-Sheet 1



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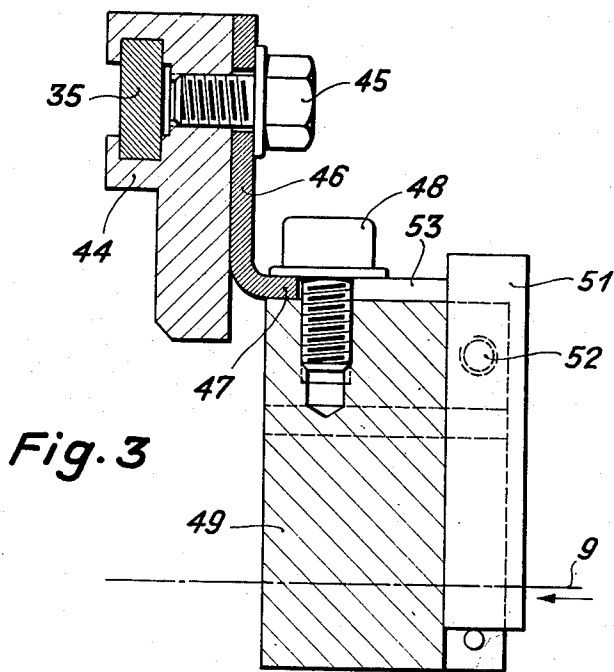
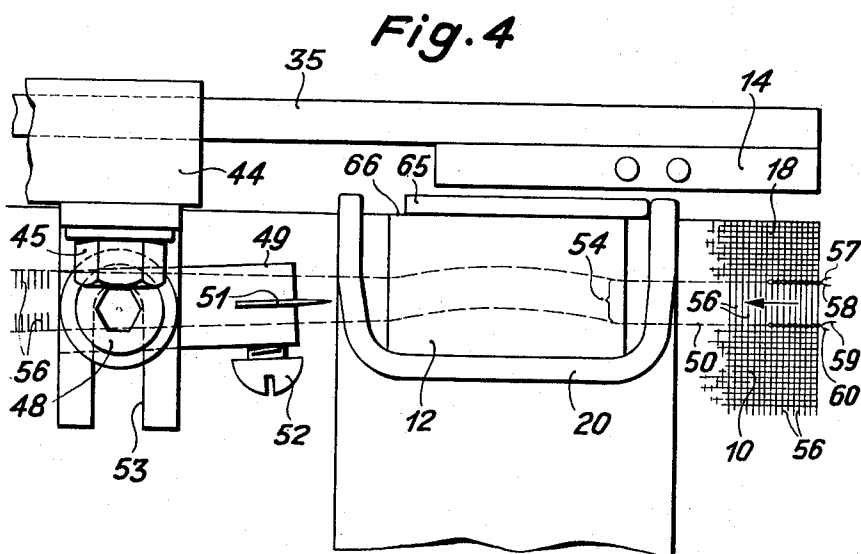
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2 Sheets-Sheet 2



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FABRIC CONTROL AND SEVERING MEANS FOR A LOOM

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5 Claims. (Cl. 139—291)

The invention relates to a weaving machine, particularly to a weaving machine of the gripper shuttle type, having temples and severing means for cutting off a portion of the fabric in the direction of the warp during operation of the weaving machine. The severing means according to the invention is provided for the purpose of severing the selvage produced by tucking the ends of weft threads, which have been cut in the picking line by means of scissors, into the subsequent shed, and for parting and cutting the fabric into two or more lengths of fabric.

In conventional looms severing means for severing a selvage from the main body of the fabric and for parting the fabric into two or more lengths of fabric are placed in the neighborhood of the breast beam of the loom. In the loom according to the invention such severing means are placed adjacent to the temples at the sides thereof where the fabric emerges from the temples and are secured against movement in the direction parallel with the picking line.

The severing means forming part of the loom according to the invention includes cutting means which may be in the form of knife, or of scissors. The cutting means may also be formed by a saw having fine teeth, by a heated wire, or by a water or gas jet. The cutting means is placed adjacent to and not more than approximately $\frac{3}{4}$ " from the location where the fabric emerges from the respective temple, measured in the direction of movement of the fabric.

The temples keep the web stretched transversely and exactly guide the web or fabric. At the location where the severing means are arranged the guiding action of the temples is fully effective and the fabric is most stable so that an accurate cut can be made at a predetermined point which does not change its location. If the portion of the fabric to be severed, for example a selvage, is separated from the main body of the fabric by twisted warp threads, the cutting means of the severing device can be placed very close to the twisted threads at the edge of the main body of the fabric. In that case the weft thread ends projecting from the fabric are very short and of equal length. Because of the accurate and taut guidance of the fabric by the temples there is no danger of cutting into the main part of the fabric. Due to the exact guidance of the fabric by the temples at the location of the cutting means the twisted warp threads adjacent to the selvage and adjacent to the main body of the fabric may be very little spaced and form a narrow path, free of warp threads, wherein the severing means operate and along which the selvage is cut off. The width of this path may be about $\frac{3}{32}$ " only.

In looms having selvage-forming devices adjacent to temples the severing means may be connected to and operated by a part of the selvage-forming devices without changing the movements of said part. The selvage-forming devices includes weft thread clamps placed in the neighborhood of the temples for seizing and holding the projecting ends of weft threads to be cut preparatory to tucking the weft thread ends into a subsequent shed. These weft thread clamps have elements for moving the

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clamps up and down, i.e. at a right angle with the plane of the fabric adjacent to the picking line. According to the invention the severing means are operatively connected to said vertically reciprocating elements of the weft thread clamps and are actuated simultaneously therewith. The severing means are preferably connected to guides for horizontally guiding said elements, said guides being moved up and down for imparting an up and down movement to the clamps.

The novel features which are considered characteristic of the invention are set forth with particularity in the appended claims. The invention itself, however, and additional objects and advantages thereof will best be understood from the following description of embodiments thereof when read in connection with the accompanying drawing wherein:

FIG. 1 is a diagrammatic plan view of a part of a loom for weaving of the gripper shuttle type and equipped according to the invention.

FIG. 2 is a large scale vertical sectional view of a portion of the loom shown in FIG. 1, the section being made along line II—II of FIG. 1.

FIG. 3 is a large scale sectional view of a part of the portion of the loom shown in FIG. 2, the section being made along line III—III of FIG. 2.

FIG. 4 is a top view of parts in the neighborhood of line III—III of the portion of the loom shown in FIG. 2.

Referring more particularly to FIG. 1 of the drawing, numerals 1 and 2 designate lateral frame elements supporting a shuttle picking device 3, a shuttle receiving device 4 for receiving shuttles after they have inserted weft threads 56 (FIG. 4), a plurality of heald frames 5, and a two-piece cloth beam 6a, 6b. The shuttles are picked along a line 7. The beat-up line of the weft threads is designated by numeral 8, the cloth or fabric is designated by numeral 9 and the warp threads are designated by numeral 11.

As seen in FIGS. 1 and 2 a temple 12 covered by a cover 20 is placed adjacent to the shuttle picking device 3. A second temple 13 is placed adjacent to the shuttle receiving device 4. In the middle of the fabric 9 a double temple including a temple 62 and a temple 63 is provided. The temples 12, 13, 62 and 63 are substantially equally constructed. The outer ends of the outer temples 12 and 13 are each provided with a finger-like guide 65 for guiding the fabric 9, as seen in FIGS. 2 and 4.

A lateral thread clamp 14 is actuated by the shuttle picking mechanism 3 and a lateral thread clamp 15 is actuated by the shuttle receiving mechanism 4. Adjacent to the temples 12, 13, 62 and 63 severing devices 16, 17 and 64, which will be described in detail later, are arranged for cutting weft threads immediately after the cloth has left the temples. The severing devices 16 and 17 are operatively connected to the thread clamps 14 and 15, respectively, for joint operation with the thread clamps. The cutting device 64 may be operatively connected to the lay or to the main shaft of the weaving machine for actuation thereby. All cutting devices 16, 17 and 64 are reciprocatingly movable in vertical direction.

Selvages 18 and 19 are formed at the lateral edges of the cloth 9 by tucking the ends of the weft threads 56 (FIG. 4) immediately after insertion of the weft threads into the subsequent shed. The weft threads have been cut by scissors 30 placed in the picking line 7. The selvages 18 and 19 are separated from the main part 10 of the cloth, for example, by two pairs of crossed warp threads or binding threads 57, 58 and 59, 60. In this way a channel 54 is produced wherein there are no warp

threads and which may be, for example, 2 mm. wide. Each pair of threads 57, 58 and 59, 60 forms a crossed binding, for example a twisted binding. The selvages 18 and 19 are cut away from the main body of the cloth by the severing devices 16 and 17 and are wound on rollers 21 and 22, shown in FIG. 1.

The shuttle picking mechanism 3 includes a shaft 23 (FIG. 2) driven by the main drive of the loom. Two cams 24 and 25 are made fast on the shaft 23. A cam follower lever 26 cooperates with the cam 24, the lower end of the lever being pivotally connected to a lever 28. The latter is swingably mounted at 29 and is pulled to the right in FIG. 2 by means of a spring 32 having one end connected to a stationary part of the loom and the second end connected at 31 to the free end of the lever 28. The spring 32 maintains engagement of a cam follower roller 33 mounted on the lever 26, with the cam 24. The upper end of the lever 26 is pivotally connected at 34 to a rod 35 whose right end supports a weft thread clamp 14. The latter is reciprocatingly moved by the elements 24, 26 and 35 for seizing each inserted weft thread whereupon the weft thread is cut by the scissors 30 (FIG. 1). The projecting free end of the cut weft thread is tucked into the subsequent shed.

A roller 42 mounted on a three-arm cam follower lever 37, 38, 39 which is swingably mounted at 36 to a stationary part of the loom engages the cam 25, the lever 37, 38, 39 being pressed downward by a spring 41 (FIG. 2). The arm 39 of the three-arm lever pivotally supports at 43 a guide 44 for horizontally guiding the rod 35. This arrangement maintains the vertical position of the rod 35. The guide 44 is moved up and down by the elements 25, 38 and 39 for vertically moving the thread clamp 14 in addition to the horizontal movement thereof. The vertical movement of the clamp 14 is necessary for accurately seizing the weft thread and transferring it to a tucking or selvage-forming needle.

An angle 46 is connected to the guide 44 by means of a bolt 45. The angle 46 has a portion 47 provided with a slot 53. A blocklike knife carrier 49 is adjustably connected to the part 47 by means of a bolt 48. The carrier 49 is provided with a slot into which a knife 51 is inserted and clamped to the part 49 by means of a screw 52. The elements 49, 51 form a cutting device which is designated by numeral 16 in FIG. 1, for severing the selvage 18 from the cloth 10.

The angular position of the knife carrier 49 around the vertical axis of the bolt 48 can be more or less close to the selvage 18 or to the main portion 10 of the cloth. The slot 53 and the bolt 48 also permit changing the distance of the carrier 49 from the rod 35 and from the outermost warp thread.

In this way the length of the weft thread ends projecting beyond the edge 50 of the fabric can be changed. When working with smooth weft threads, for example rayon, the position of the knife will be so adjusted that it is in the upper part of the passage 54 shown in FIG. 4 so that the projecting weft thread ends are relatively long and the twisted threads 59 and 60 do not slip from the weft threads 56 and fraying is avoided. If working with cotton, the edge of the knife 51 is preferably placed in the position shown in FIG. 4, or even further down so that the ends of the weft threads extending beyond the edge 50 are very short, for example only 0.5 mm.

By swinging the knife carrier 49 around the axis of the bolt 48 the position of the knife 51 can be slanted according to the shrinking of the cloth, i.e. reduction of the width of the cloth lengths 9a and 9b in FIG. 1 to the widths 10a and 10b relative to the width of the cloth at the beat-up line 8.

The cloth 9 is cut by the cutting device 64 to form two lengths 9a and 9b which are wound onto the cloth beams 6a and 6b, respectively. The neighboring edges of the two cloth lengths are defined by twisted warp

threads for avoiding fraying of the neighboring edges of the cloth lengths.

The mounting of the cutting device 64 is similar to the mounting of the cutting devices 16 and 17 so that displacement in the direction of the weft threads 56 is definitely prevented. The position of the cutting knife in the direction of the weft threads, however, can be changed upon loosening of the bolt 48 and re-tightening the bolt after the knife has been placed in the desired position. The cutting devices 17 and 64 are preferably slidably arranged on a rod mounted on the loom frame parallel to the picking line and can be fixed in several positions according to the desired width of the lengths of cloth woven on the loom. Preferably, the double temple 62, 63 together with the cutting device 64 are adjustably mounted as a unit on the aforementioned rod and the shuttle receiving device 4 together with the temple 13, the clamp 15 and the cutting device 17 are also adjustably mounted as a unit on the rod and can be fixed thereon to suit the desired width of the cloth. The cutting device 64 has a single cutting edge placed in a plane normal to the woven fabric and extending between the neighboring ends of the axially aligned temples 62 and 63.

The guide element 65 prevents sliding of the edge of the cloth beyond the outer end 66 of the temple 12. If such sliding would occur there would be a possibility that the knife 51 cuts into the main part 10 of the cloth. If the cloth deviates from the desired path it can only move inward on the temple. In this case the knife 51 may cut into the selvage 18, causing little damage.

In a modification of the invention either some or all of the cutting devices 16, 17 and 64 are stationary, i.e., are mounted on the shuttle picking device 3 and on the shuttle receiving device 4 or on the temples 12, 13, 62 and 63.

If movable cutting devices are used, they may be operatively connected, for example, to the drive of the head frames instead of to the weft thread clamps. The cutting device or devices for parting the cloth into two or more lengths may be stationary. These cutting devices may replace the function of the otherwise required selvage-forming devices which tuck the weft thread ends projecting from the neighboring edges of the cloth lengths into the shed after the weft threads have been cut by scissors corresponding to scissors 30 and operating in the picking line 7, to form a selvage. In this case the neighboring edges of the lengths of fabric must be secured against fraying by pairs of twisted warp threads or by special twisted binding threads.

I claim:

1. A machine for weaving a fabric from warp and weft threads, comprising:

temples,

means for cutting off the ends of the weft threads projecting from the edge of the fabric,

a clamping mechanism for holding the ends of the weft threads during cutting off of the weft thread ends,

said clamping mechanism including a weft thread clamp and a clamp carrying means capable of being vertically reciprocatingly moved for vertically reciprocatingly moving said clamp,

severing means placed adjacent to said temples at the sides thereof where the fabric emerges from the temples for cutting off a portion of the fabric in the direction of the warp during operation of the weaving machine, and

means supporting said severing means and including means for securing said severing means against movement in the direction of the weft threads,

said supporting means being connected to said clamp-carrying means for vertical reciprocating movement of said severing means simultaneously with the vertical reciprocating movement of said clamp-carrying means.

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2. A machine as defined in claim 1 wherein said clamp carrying means includes a substantially horizontal rod, said means supporting said severing means being longitudinally slidable on said rod.

3. A machine according to claim 2 including means for vertically reciprocatingly moving said means supporting said severing means for vertically reciprocatingly moving said rod and the clamp carried by said carrying means.

4. A machine as defined in claim 1 including guide means for said clamp carrying means for guiding the latter to move in a substantially vertical direction, said guide means forming part of said supporting means for said severing means.

5. A machine as defined in claim 1 wherein said supporting means includes means swingable around a substantially vertical axis and including said securing means for securing said severing means in a predetermined angular position relative to the direction of the warp.

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