June 3, 1958 V. M. J. ANCET ET AL 2,837,124

SHUTTLELESS WEAVING LOOM

Filed June 1, 1954 6 Sheets-Sheet 1

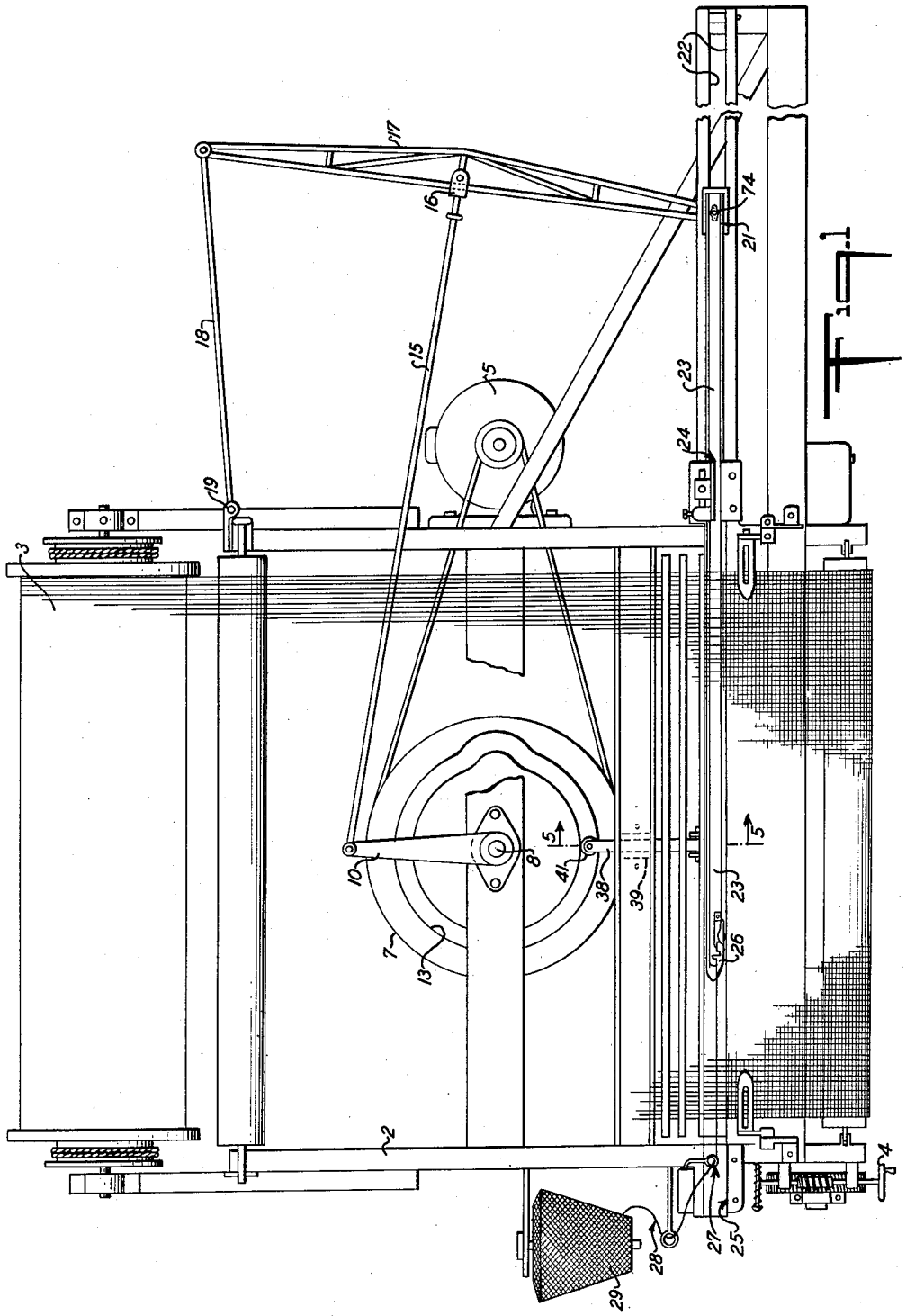


FIG. 1

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SHUTTLELESS WEAVING LOOM

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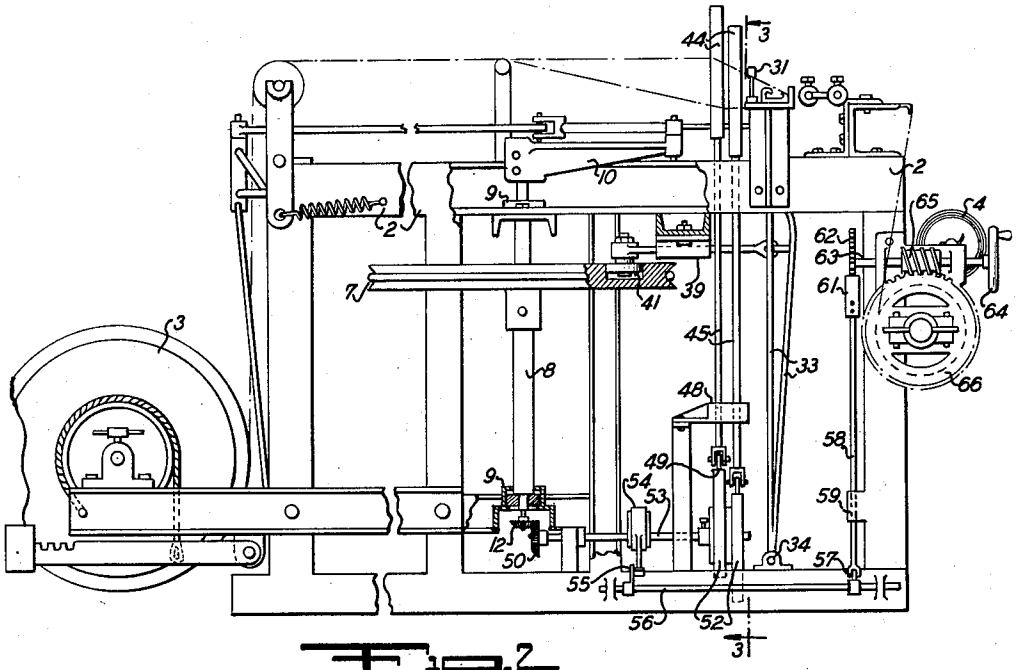


FIG. 2

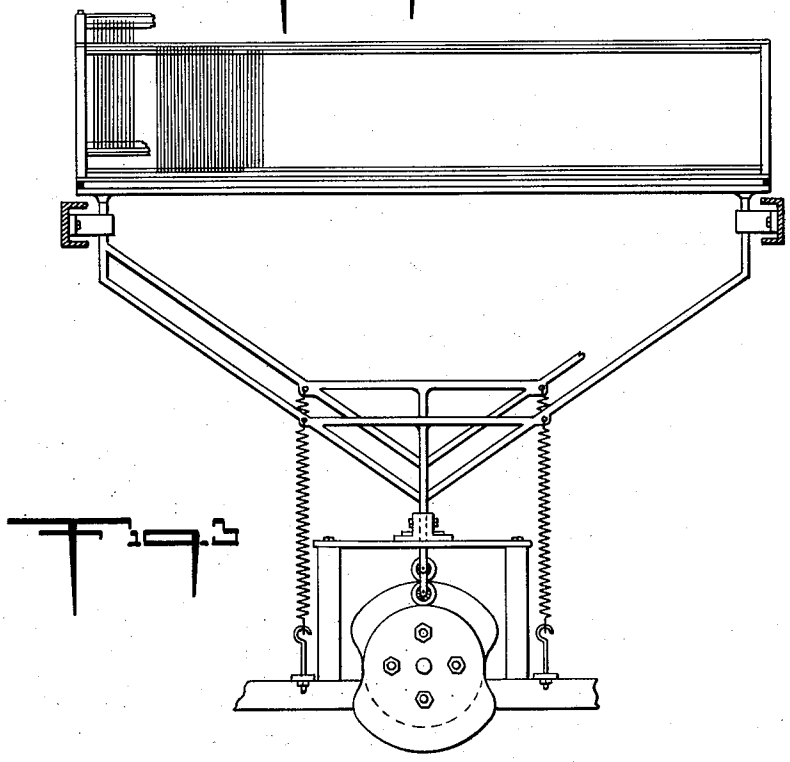


FIG. 1

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SHUTTLELESS WEAVING LOOM

Filed June 1, 1954 6 Sheets-Sheet 3

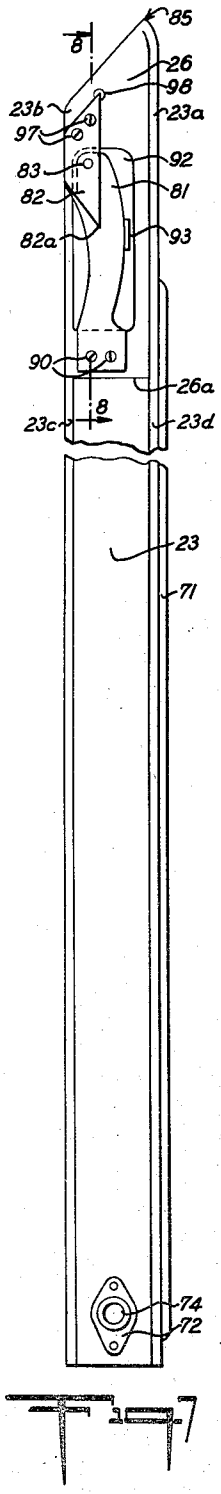


FIG. 7

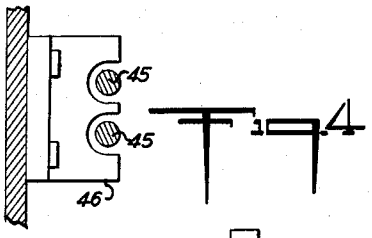


FIG. 4

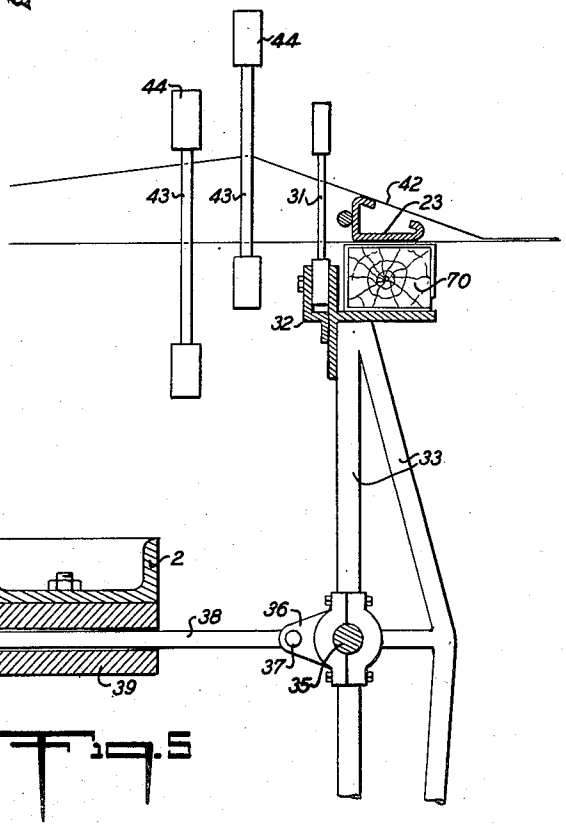


FIG. 5

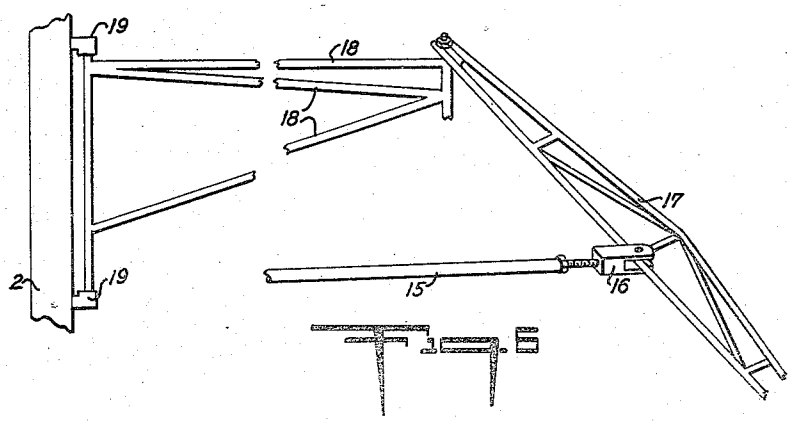


FIG. 6

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SHUTTLELESS WEAVING LOOM

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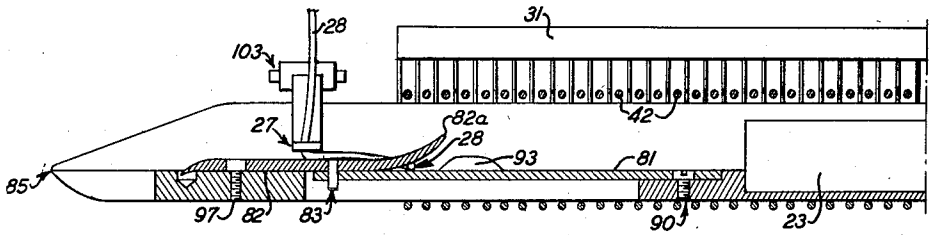


FIG. 8

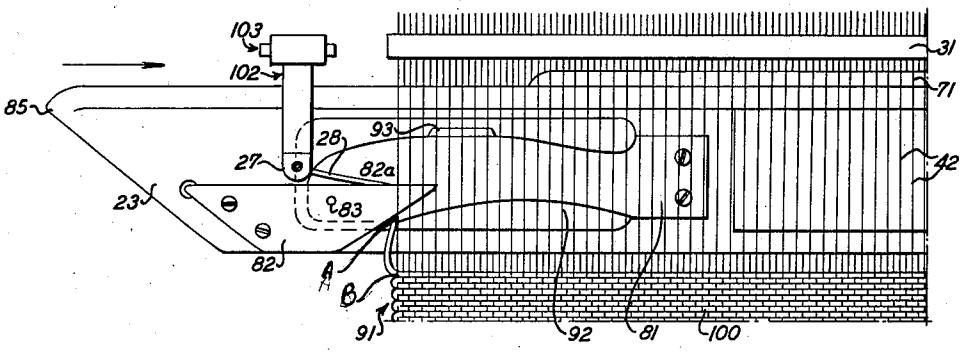


FIG. 9

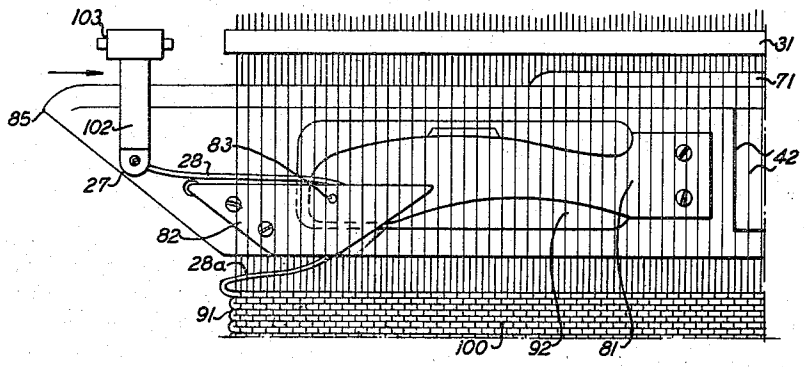


FIG. 10

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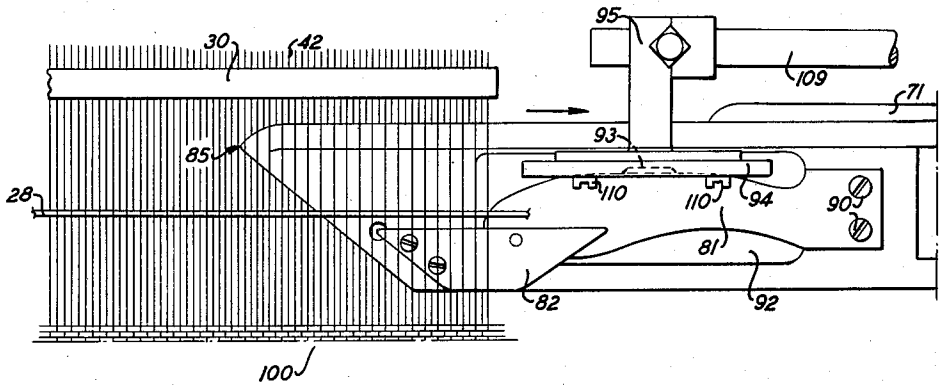


Fig. 11

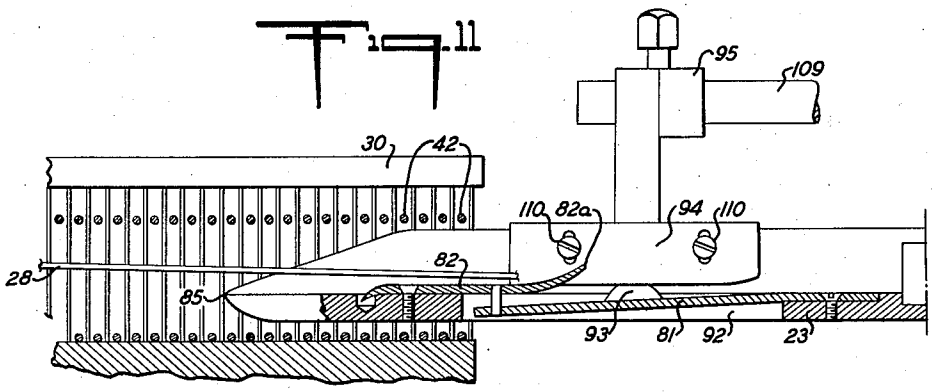


Fig. 12

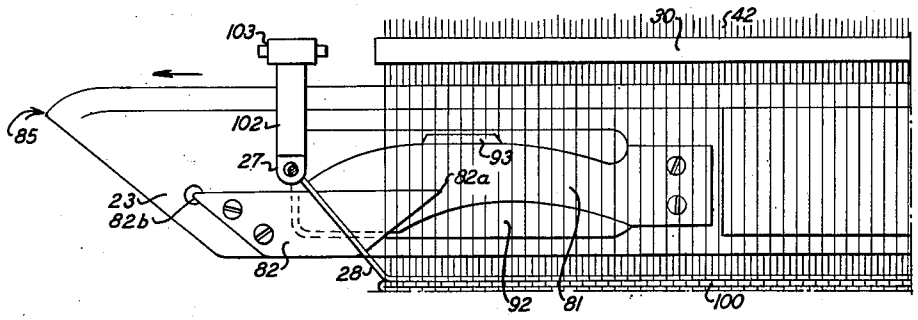


Fig. 13

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SHUTTLELESS WEAVING LOOM

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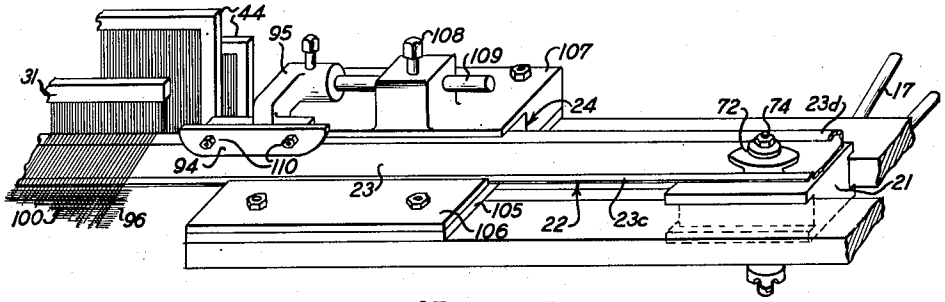
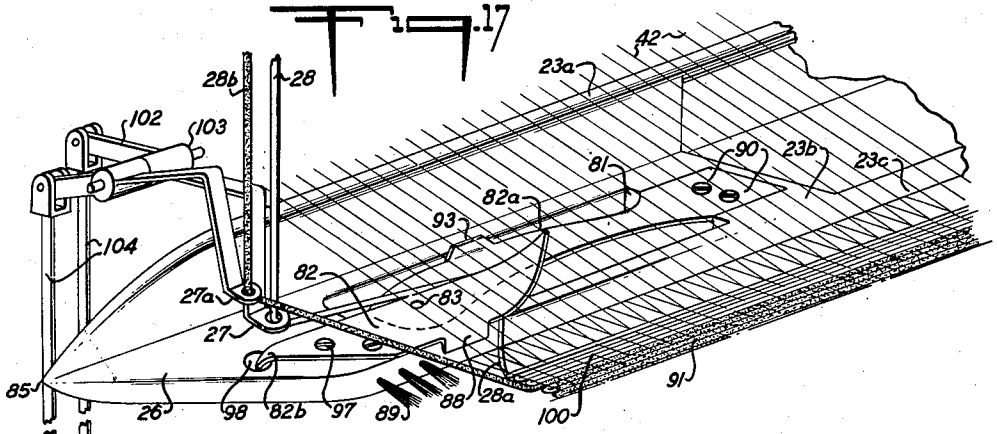


Fig. 17



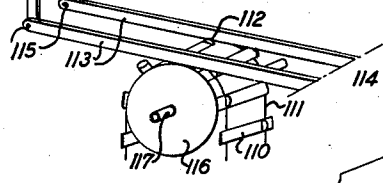
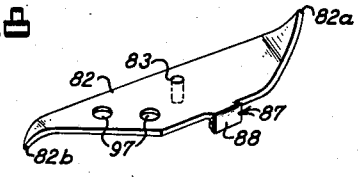


Fig. 18



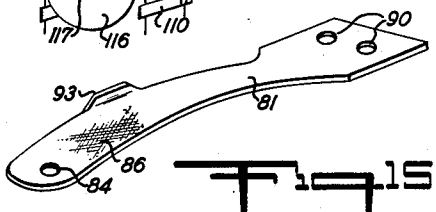


Fig. 16

Fig. 15

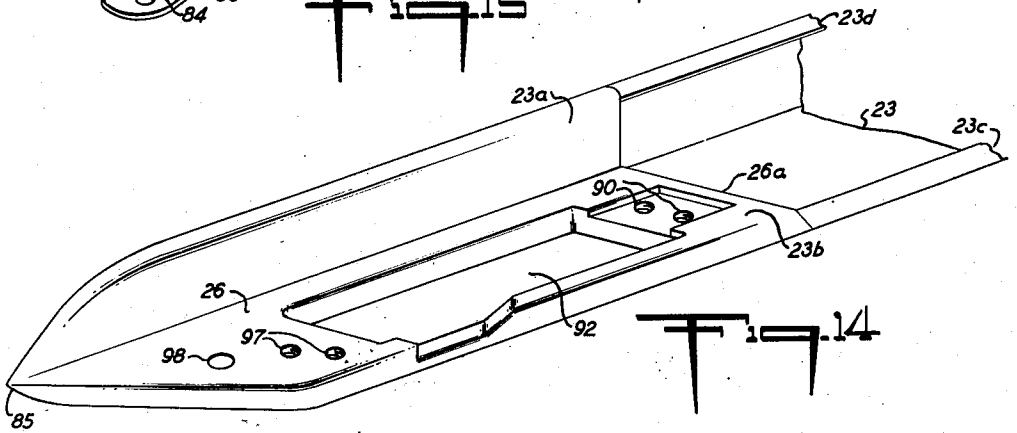


Fig. 14

United States Patent Office 2,837,124
Patented June 3, 1958

2,837,124

SHUTTLELESS WEAVING LOOM

Victor Marie Joseph Ancet and Marius Fayolle, also known as Marcel Fayolle, Lyon, France

Application June 1, 1954, Serial No. 433,739
Claims priority, application France June 9, 1953
21 Claims. (Cl. 139—123)

Our invention has for its object a number of improvements in the execution of shuttleless weaving looms.

Although our said invention relies on conventional technical principles, it has for its object a novel loom in which the usual mechanical complications are cut out while the parts constituting it are strong and simple and provide a highly reliable operation together with an economical execution. Our invention has more precisely for its object a loom the different operations of which (control of the shed, feeding of the weft and beating up of said weft) are controlled by a common vertical central shaft together with novel means for:

The positioning of the weft in front of the drawing member.
The engagement of the weft thread by said member.
The release of said thread at the required moment when a sufficient length thereof has been drawn through the shed.
The cutting of the weft thread.
The execution of selvedges.
The reciprocatory control of the weft-drawing member.
The control of the batten and, the control of the shed.

Our invention will be better understood after reading the following disclosure relating to a preferred embodiment of our improved weaving loom illustrated by way of example in accompanying drawings, wherein:

Figs. 1 and 2 are general views respectively from above and from one side of said embodiment of a weaving loom.

Fig. 3 is a vertical sectional view through line 3—3 of Fig. 2.

Fig. 4 is a detail sectional view through line 4—4 of Fig. 3.

Fig. 5 is a partial sectional view through line 5—5 of Fig. 1.

Fig. 6 shows the leverage controlling the lath sword forming the weft-drawing member.

Fig. 7 is a general plan view of said sword or weft-drawing member.

Fig. 8 is an elevational sectional view, through line 8—8 of Fig. 7, of the head of the sword, carrying the thread-catching parts, extending through a sheet of warp threads and projecting towards the weft provision side.

Fig. 9 is a plan view of said weft-drawing member in the same position, i. e. at the moment at which the sword begins receding and is about to carry along with it the weft thread.

Fig. 10 is another plan view showing the head of the sword in a position located still more to the rear during its receding movement, i. e. at the moment at which it has just cut through the connection of the engaged thread with the preceding pick inside the shed and has left a terminal section thereof folded back inside the shed.

Fig. 11 illustrates the head of the sword appearing at the other edge of the fabric at the moment at which it releases the end of the weft which it has just carried along throughout the breadth of the fabric.

Fig. 12 illustrates in elevational, sectional view the arrangement shown in Fig. 11 for the same position of the sword.

Fig. 13 is a plan view of the sword shown as returning towards the position of Figs. 8 and 9 before the weft thread has engaged the interval between its weft-catching parts.

Fig. 14 shows in full detail the head of the sword, the weft-catching parts of which have been disconnected

Figs. 15 and 16 illustrate respectively each of the weft-catching parts.

Fig. 17 is a perspective view showing the means for guiding the sword and connecting it with its actuating member and it also shows the slope providing for the release of the pick.

Fig. 18 is a perspective view corresponding to Fig. 10 with the addition of associated means for interchanging two different wefts.

In Figs. 1, 2 and 3, **2** designates the frame of the loom carrying along its rear edge the warp beam **3** and along its front edge the fabric winding roller **4**. The frame **2** is provided laterally with an electric motor **5** driving through the belt **6** a pullely **7** keyed to a shaft **8** located vertically in the plane of symmetry of the loom body. Said shaft carried by and revolving in the bearings **9** carries at its upper end a crank **10** and at its lower end a bevel wheel **12**. The pulley **7** includes a plate inside the upper surface of which is provided an annular groove **13** deformed at **14** so as to be sinuous over a fraction of its periphery.

The crank **10** is pivotally secured to the end of a tubular connecting rod **15**, terminating as shown in Figs. 1 and 6 with a strap **16** wherethrough it may be coupled in an adjustable manner to a lever **17** constituted by a system of stayed tubes. Said lever **17** is in its turn connected through one end with another lever of the same type **18** revolubly carried inside bearings **19**, the axis of which is vertical, said bearings being carried by the frame **2** of the loom. At its other end, the lever **17** is pivotally secured to a slider **21** carried inside a slideway **22** rigid with the frame **2** along its front edge as will be disclosed with further detail hereinafter.

Said slideway **22** extends over a length that is more than double the breadth of the fabric. It is as a matter of fact adapted to allow the movements of the slider **21** on which is mounted the member **23** which serves for drawing the weft along. In fact said weft-drawing member **23** may be drawn completely outside and beyond the shed so as to allow the beating up of the weft.

The weft-drawing member **23** assumes therefore a continuous reciprocating movement as provided by the rotary shaft **8** transmitting movement through crank **10**, connecting rod **15** and lever **17** to the slider **21**. Said member **23** rests not only on the slider **21** but also, near the entrance into the shed, inside a short passageway **24**.

On the other side of the loom is provided another passageway **25** alinged with said passageway **24** and wherein the head **26** of the weft-drawing member **23** is engaged so as to be properly positioned underneath the thread guide or guides **27** which distribute the weft **28** fed from a provision **29** positioned laterally with reference to the frame of the loom. Between the two passageways **24** and **25**, the weft-drawing member **23** is held in register with the reed **31** (Figs. 2 and 5) by the usual projecting part **70** of the batten **33**.

Said reed is carried by a fitting **32** (Figs. 2 and 5) secured to the upper edge of the batten **33**. The latter, constituted by a system of stayed tubes, is pivotally secured through its lower edge to an axis **34** carried by the frame **2**.

The batten is provided in proximity with its upper edge with a cylindrical transverse member **35** engaging

a bearing 36 pivotally secured at 37 to an arm 38 which is slidingly carried inside a slideway 39 rigid with the frame 2; the rear end of said arm 38 carries a roller 41 engaging the groove 13 in the plate-shaped pulley 7.

The angular setting of the pulley 7 on the main shaft 8 being suitably defined, the batten 33 remains stationary in its rear position while the roller 41 runs in the annular part of the groove 13 and it is then suddenly shifted forwards to beat up the weft when said roller engages the sinuous fraction 14 of said groove; during said shifting, the weft-drawing member 23 continues moving outside the shed.

By reason of the very small cross-section of the weft-drawing member 23 and of its head 26, it is sufficient to open the shed 42 (Fig. 5) to a very small extent when providing for the passage therethrough of said weft-drawing member. Consequently the loom according to our invention is provided with a particularly simple arrangement for the control of the healds 43 in the case of simple weaves for plain fabrics.

Said healds are carried by frames 44 rigid with supports 45 (Figs. 2 and 3) which are adapted to slide vertically through the notches 46 (Figs. 3 and 4) in a part rigid with the frame 2. Each of said supports 45 is provided in its lower medial part with a rod 47 carrying a roller 49 and adapted to slide freely inside a vertical slideway 48 rigid with the frame 2. Under the action of gravity and of the traction exerted by the springs 51 on the supports 45, the latter are urged into direct engagement through their rollers 49 with the corresponding cams 52 keyed to a shaft 53, each cam being located in the plane of the heald-carrying support controlled thereby.

Said shaft 53 positioned in the medial longitudinal plane of the loom body carries at its rear end a bevel pinion 50 meshing with a pinion 12 carried by the main shaft 8.

In the case of a taffeta weave, as assumed in the example illustrated in the drawing, the two cams 52 are keyed at 180° with reference to each other on the shaft 53 and the two heald-carrying supports are raised in alternation by said cams.

When the ratio between the pinions 12 and 50 is not less than 1/2, which is the case when using a taffeta weave, the drive of the roller 4 receiving the fabric may be obtained through the secondary shaft 53; to this end, the latter carries an eccentric 54 as shown in Fig. 2, said eccentric member producing through a crank pin 55 the rocking of a shaft 56 carrying a further crank 57 to which is pivotally secured a rod 58. The latter assumes a reciprocating movement inside the bearings 59 and carries at its upper end a catch 61 elastically engaging a notched wheel 62. Said wheel is carried by a shaft 63 provided with an adjusting handwheel 64 and with a worm 65 meshing with a wormwheel 66 driving in any suitable manner the fabric-winding roll 4. This arrangement provides a progression of the fabric for every two weft shoots.

The head 26 which will be described hereinafter with further detail forms the front end of the weft-drawing sword 23. Said sword (Figs. 7 and 14) includes a shaped metal part forming with the head 26 to which it is welded at 26*a* an unbroken member which is light and rigid. Said shaped part obtained starting from a thin metal sheet has a cross-section the shape of which is that of an L or that of an angle bar, the two flanges 23*a* and 23*b* of which are turned inwardly so as to form a channel along their corresponding edges 23*c* and 23*d*. The vertical flange is outwardly lined with a longitudinal shoe 71 made of a light friction-resisting material, such as agglomerated wood or plastic material, so as to form the guiding means for the sword 23 first inside the passageway 24 (Figs. 1 and 17) and then along the reed 31 if it is necessary to make the sword engage the latter. In the rear end (Figs. 1, 7 and 17) of the sword 23 is inserted a boss 72 inside which is formed an opening the axis of which is perpendicular to the horizontal flange 23*b* of the sword. Said opening allows the passage therethrough of the stem 74 of a bolt or the like member wherethrough the sword 23 is secured to the slider 21 assuming as disclosed hereinabove a reciprocatory movement inside the stationary slideway 22. The sword 23 is thus projected into the shed in the manner of a billiard cue moving with reference to the hands of a player: the slider 21 corresponding to the hand pushing the cue while the passageway 24 corresponds to the hand guiding said cue.

Figs. 8 to 16 and 18 relate chiefly to the constitution and operation of the elements forming the head 26 of the sword 23 and adapted to engage the weft thread 28 at the moment required for the drawing of said thread, after which said elements release said thread. The different elements forming the sword head include two plates 81 and 82 (Figs. 15 and 16) positioned above each other and secured in head to tail relationship over the horizontal flange 23*b* of the head of the sword 23. The plate 82 is in contact with the plate 81 and covers the latter at least partly so as to form therewith a substantially V-shaped unit, the apex of the V corresponding to the point of contact between the plates while its opening is directed towards the rear section of the sword.

To this end, the upper plate 82 is slightly raised so as to form a nose 82*a* near one of its ends, said nose 82*a* extending in the direction of receding motion of the sword 23.

On the other hand, the lower plate 81 elastically urges the upper plate 82 upwardly so that it is possible by lowering said plate 81 to cut out the contacting point between the plates.

In the above described contacting area is located a depending stud 83 carried by the upper plate 82 and passing freely through the lower plate 81 as allowed by an opening 84 in the latter. These parts 81—82 are protected by the vertical flange 23*a* of the sword 23, the upper edge of said vertical flange having an outline slowly sloping downwardly towards its pointed end 85. It is apparent that a thread 28 appearing underneath the level of the tip 82*a* of the plate 82 engages the interval between the plates 82 and 81 during the receding movement of the sword 23, but only during said movement.

In contradistinction, and by reason of the presence of the vertical flange 23*a*, no warp thread 42 may at any moment and under any circumstances be engaged by the sword.

When the weft thread 28 has begun engaging the interval between the two plates 81 and 82, it has a tendency to be wedged therebetween and all the more so when it opposes a greater resistance against progression. To increase said wedging effect, the plates 81 and 82 may be provided on their contacting sections with striations 86 (Fig. 15).

The stud 83 has for its object to limit the engagement of the thread 28 and to locate it each time accurately. Said stud furthers also the subsequent release of the thread.

Fig. 9 shows how the weft thread 28, fed from the provision 29 (Fig. 1) and passing through the thread-guide 27 leading it to a level lower than that of the nose 82*a* of the plate 82 at a location between said nose and the vertical flange 23*a* of the sword, is engaged between the two plates 81 and 82 when said sword 23 begins its receding motion.

It will be remarked that said weft thread 28 is still bound with the preceding weft through a point B on the selvedge of the fabric that is being woven.

It is readily apparent that, if the sword 23 continues receding in the direction of the arrow illustrated in Fig. 9, the thread will of necessity break between said point B and the point A at which it passes out of the interval between the two plates 81 and 82.

However, in order to avoid any abnormal stress on the selvedge threads and also an irregular or incomplete breaking of the thread, we provide, according to the in-

vention, a cutting member on the path A—B, whereby the thread is applied on the cutting edge of said member as a consequence of its reversal, as apparent from inspection of Figs. 9, 10 and 18. In accordance with a preferred embodiment, Fig. 16 shows the plate **82** provided with a cutting edge **87** on its suitably bent and sharpened section **88**. Said cutting edge on the weft drawing member faces thus the line along which the fabric is being formed.

Fig. 18 is a perspective view of the weft thread **28** as it is being cut over the cutting edge **87**. Furthermore, it shows that the free end of the weft thread **28***a* which has been cut along the edge of the fabric is turned in over a predetermined length inside the shed. This automatic turning in thus obtained allows providing, along the edge of the fabric that is being woven, an excellent selvedge **91** constituted by the inturned thread ends. In order to hold said inturned ends in position, the end of the weft drawing member carries along its edge a few projecting bristles **89** which, as they pass over the thread, urge it towards the bottom of the shed. This arrangement which is optional is illustrated only in Fig. 18.

Our invention also provides an arrangement such that, when the head **26** of the sword **23** has passed through the shed and has carried the weft thread **28** along with it over a suitable length, said weft thread is released and passes out of the interval between the plates **81** and **82**.

In said arrangement, the lower plate **81** is constituted by a spring blade the free end of which bears elastically with a suitable pressure against the plate **82** so as to urge the latter upwardly, which cuts out the necessity of providing a pivotal connection.

On the other hand, its free end is not entirely covered by the plate **82** and extends breadthwise between the nose of said plate **82** and the vertical flange **23***a* of the sword. Said lower plate is secured at **90** to the horizontal flange **23***b* of the sword through its other end and it extends in overhanging relationship over a rectangular gate **92** formed in said flange **23***b*. This elongated gate or recess **92** opens laterally into an auxiliary recessed part **120** formed in the edge of the horizontal flange **26** of the head of the sword. This auxiliary recessed part provides on the one hand a passage for the weft thread while on the other hand the cutting section **88—87** of the upper blade **82** (Fig. 16) engages said recessed part. On the other hand, a small upstanding boss **93** is formed on said plate **81** in the area located between the plate **82** and the flange **23***a* whereby the rectilinear path of said boss is spaced with reference to that of the plate **82**. Said boss or projection may be formed in one with the material of the actual plate which is suitably bent for this purpose.

When the head of the sword is just about to be retracted entirely outside the shed, the boss **93** on the plate **81** passes underneath a slope **94** (Figs. 11, 12 and 17) which is suitably adjusted as to position and is carried by a support **95** the position of which is adjustable. When the boss **93** engages the underside of the slope **94**, it is submitted to a thrust which imparts a downwardly directed movement to the end of the elastic plate **81**.

The contact between the two plates **81** and **82** being cut out, the thread **28** to which a slight tension has been imparted by a suitable braking, is released and ceases immediately being drawn along. The position of the carrier **95** for the slope **94** being adjustable, it is possible to define very accurately the length of the weft and in particular to provide for the free ends **96** (Fig. 11) to form the opposite selvedge of the fabric **100**, by resorting to a gauze pitch arrangement.

It should be remarked that the upper plate **82** secured at **97** to the sword **23** has its end **82***b* opposed to its end **82***a*, in the shape of a bent nose the direction of which is opposed to that of the nose at **82***a* so as to engage an opening **98** formed in the flange **23***b* and to cut out under

all circumstances any possibility of engaging the thread (Figs. 14, 16 and 18).

As disclosed hereinabove, the thread **28** passes through a thread-guide **27** the lower end of which lies at a level lower than that of the nose **82***a* of the plate **82**, between said nose **82***a* and the vertical flange **23***a* of the sword.

According to our invention, said thread-guide **27** is carried by an arm **102** pivotally secured to a stationary point **103** while a plurality of thread-guides, two in the case illustrated in Fig. 18, through which pass respectively the threads **28** and **28***b*, are provided in close proximity with each other as shown at **27—27***a*.

It is apparent that if, under the action of a linkage **104**, one of the thread guides is raised, the corresponding weft thread is no longer within reach of the nose **82***a* on the sword. On the contrary, if the thread-guide is lowered, its thread is again capable of being engaged by the nose **82***a*. In the case of Fig. 18, the thread-guide **27** is shown in its lower position and its thread **28** is caught by the catching plates. The thread-guide **27***a* is raised and its thread **28***b* is in its inoperative position. Any suitable mechanism acting on the linkage **104** may provide for the instantaneous interchange of the threads **28** and **28***b* between two passages of the weft drawing member. This mechanism may comprise, for example, a belt consisting of elements **110** and **111** operatively engaging at **112** the links **113** pivotally supported at **114** and connected by pins **115** to the linkage **104**.

The guiding channel **24** for the sword **23** is defined by a plate **105** (Fig. 17) secured to the end of the slideway **22**; said plate **105** carries on one hand an auxiliary plate **106** providing for the guiding of the sword along the inturned edge **23***c* of its flange **23***b* and, on the other hand, a carrier **107** along which the shoe **71** guiding the sword is adapted to slide.

To the carrier **107** is secured, at a point, the longitudinal position of which is adjusted by the screw **108**, a rod **109** serving as a holder for the support **95** to which the thrust-exerting slope **94** is secured at a level which may be adjusted as provided by elongated openings therein associated with the bolts **110**.

What we claim is:

1. A method for laying a pick in a shuttleless loom including a weft drawing member adapted to reciprocate through the shed, a weft means feeding weft to one end of the reciprocating path of said weft drawing member and a clamping member rigid with the weft drawing member the opening of which faces the rear of the weft drawing member, said method consisting in shifting the inoperative weft drawing member throughout the breadth of the fabric inside the shed until the weft clamping member has moved ahead of the weft feeding means, leading the weft thread across the opening of the clamping member when the weft drawing member is approximately in its foremost position nearest the weft feeding means, causing the weft drawing member to recede with the clamping member engaging the weft thread to lay a pick during its receding movement, severing the pick to be laid from that precedingly laid at the beginning of said receding movement, releasing the weft thread from the clamping member at the end of the laying of the pick when the weft drawing member has receded throughout the breadth of the shed and returning forwardly said now inoperative weft-drawing member for further operation.

2. In a shuttleless weaving loom, the combination of means feeding weft into one side of the shed, a weft drawing member adapted to be shifted forwardly towards the location of hte selvedge facing the weft feeding means and then back throughout the breadth of the location of the fabric which is being woven, an elastic weft clamping member carried by said weft drawing member and opening in the direction of the rear end of the weft drawing member, said clamping member being adapted to engage and carry along with it during its receding movement the weft thread fed by the weft feeding means to lay said

thread in the shed, the clamping member including cutting means adapted to sever the pick which is being laid from the pick which has been precedingly laid at a point slightly on the inside of said selvedge facing the weft feeding means.

3. In a shuttleless weaving loom, the combination of means acting on the warp threads to form a shed, means feeding weft into one side of the shed, a weft drawing member having at least in its front section an L shaped-cross-section including an horizontal shoe flange and a vertical flange, the said vertical flange adapted to hold the warp sheet away from a clamping member located on the horizontal flange, the breadth of both flanges decreasing gradually towards the tip of the weft drawing member, said weft drawing member being adapted to be shifted forwardly towards the location of the selvedge facing the weft feeding means and then back throughout the breadth of the location of the fabric which is being woven, an elastic weft clamping member carried by the horizontal flange of said weft drawing member and opening in the direction of the rear end of the weft drawing member, said clamping member being adapted to engage and carry during its receding movement along with it the weft thread fed by the weft-feeding means to lay said thread in the shed, the clamping member including cutting means adapted to sever the pick which is being laid from the pick which has been precedingly laid at a point slightly on the inside of said selvedge facing the weft feeding means and means carried by the weft drawing member to turn back or to complete the turning back into the shed of the severed end of the precedingly laid pick.

4. In a shuttleless weaving loom, the combination of means acting on the warp threads to form a shed, means feeding weft into one side of the shed, a weft drawing member, a weft clamping member carried by said weft drawing member, said weft drawing member having at least in its front section an L shaped cross-section including an horizontal shoe flange and a vertical flange, the said vertical flange adapted to hold the warp sheet away from the clamping member located on horizontal flange, the breadth of both flanges decreasing gradually towards the tip of the weft drawing member, said weft drawing member being adapted to be shifted forwardly towards the location of the selvedge facing the weft feeding means and then back throughout the breadth of the location of the fabric which is being woven, an elastic weft clamping member carried by the horizontal flange of said weft drawing member and opening in the direction of the rear end of the weft drawing member, said clamping member being adapted to engage and carry during its receding movement along with it the weft thread fed by the weft-feeding means to lay said thread in the shed, the clamping member including cutting means adapted to sever the pick which is being laid from the pick which has been precedingly laid at a point slightly on the inside of said selvedge facing the weft feeding-means, and bristles carried by one end of the weft drawing member and extending towards the front of the loom and adapted to turn back or to complete the turning back into the shed of the severed end of the precedingly laid pick.

5. In a shuttleless weaving loom, the combination of means acting on the warp threads to form a shed, means feeding weft into one side of the shed, a weft drawing member having at least in its front section an L-shaped cross-section including an horizontal shoe flange and a vertical flange, the said vertical flange adapted to hold the warp sheet away from clamping member located on horizontal flange, the breadth of both flanges decreasing gradually toward the tip of the weft drawing member, said weft drawing member being adapted to be shifted forwardly towards the location of the selvedge facing the weft feeding means and then back throughout the breadth of the location of the fabric which is being woven, an elastic weft clamping member carried by the horizontal flange of said weft drawing member and opening in the direction of the rear end of the weft drawing member, said clamping member being adapted to engage and carry rearwardly along with it the weft thread fed by the weft feeding means to lay said thread in the shed, the clamping member including cutting means adapted to sever the pick which is being laid from the pick which has been precedingly laid at a point slightly on the inside of said selvedge facing the weft feeding means, a slideway extending laterally of the loom and bearing a short channel formed laterally the location of the shed in the loom and through which the weft drawing member is shifted into the shed, a slider slidingly engaging said slideway and connected with the corresponding end of the weft drawing member and a longitudinal shoe of friction resisting material lining the outside of the vertical flange of said weft drawing member and fitted between said flange and the inside of the channel to guide the weft drawing member.

6. In a shuttleless weaving loom, the provision of a weft drawing member provided with an elongated recess and adapted to reciprocate into and out of the shed formed in said loom, means feeding a weft thread into the front end of the weft drawing member when the weft drawing member has passed completely through the shed and starts to return, a clamping member including two superposed blades located in head to tail elastically interengaging relationship to form a rearwardly directed opening adapted to engage the weft thread and to draw it along with it and said weft drawing member during the receding movement of the latter, said blades being rigidly secured each to one of the longitudinal ends of the elongated recess in the weft drawing member and overlapping each other through a portion of their length above said recess, the upper blade having a free end forming a nose raised in the direction of the rear end of the weft-drawing member, the longitudinal outline of said upper blade merging gradually into contacting relationship with the lower blade to provide for a transverse contacting plane between the two blades.

7. In a shuttleless weaving loom, the provision of a weft drawing member provided with an elongated recess and with a depressed section formed in the edge of the weft drawing member and located in transverse alignment of said recess, said weft drawing member being adapted to reciprocate into and out of the shed formed in said loom, means feeding a weft thread over the front end of the weft drawing member through the depressed section thereof when the weft drawing member has passed completely through the shed and starts to return towards the weaving line inside the shed, a clamping member including two superposed blades located in head to tail elastically interengaging relationship to form a rearwardly directed opening adapted to engage the weft thread and to draw it along with it and with said weft drawing member during the receding movement of the latter, said blades being rigidly secured each to one of the longitudinal ends of the elongated recess in the weft drawing member and overlapping each other through a portion of their length above said recess, the upper blade having a free end forming a nose raised in the direction of the rear end of the weft drawing member, the longitudinal outline of said upper blade merging gradually into contacting relationship with the lower blade to provide for a transverse contacting plane between the two blades, and a cutting element rigid with the upper blade and located very near the edge of the latter facing the line along which the fabric is being woven and fitting inside the depressed section formed in the said edge of the weft-drawing member.

8. In a shuttleless weaving loom, the provision of a weft drawing member provided with an elongated recess and with a depressed section formed in the edge of the weft drawing member and located in transverse alignment of said recess, said weft drawing member being adapted to reciprocate into and out of the shed formed in said loom, means feeding a weft thread over the front end of the weft drawing member through the depressed

section thereof when the weft drawing member has passed completely through the shed and starts to return towards the weaving line inside the shed, a clamping member including two superposed blades located in head to tail elastically interengaging relationship to form a rearwardly directed opening adapted to engage the weft thread and to draw it along with it and with said weft drawing member during the receding movement of the latter, said blades being rigidly secured each to one of the longitudinal ends of the elongated recess in the weft drawing member and overlapping each other through a portion of their length above said recess, the upper blade having a free end forming a nose raised in the direction of the rear end of the weft-drawing member, the longitudinal outline of said upper blade merging gradually into contacting relationship with the lower blade to provide for a transverse contacting plane between the two blades, and a cutting element forming a downwardly bent sharpened extension of the upper blade located very near the edge of the latter facing the line along which the fabric is being woven and fitting inside the depressed section formed in the said edge of the weft drawing member.

9. In a shuttleless weaving loom, the provision of means acting on the warp threads to form a shed, a weft drawing member having at least in its front section an L-shaped cross-section including an horizontal shoe flange and a vertical flange, the said vertical flange adapted to hold the warp sheet away from clamping member located on horizontal flange, the breadth of both flanges decreasing gradually towards the tip of the weft drawing member, said weft drawing member being provided with an elongated recess in its lower flange and adapted to reciprocate into and out of the shed formed in said loom, means feeding a weft thread into the front end of the weft drawing member upon fully entering the shed, a clamping member including two superposed blades located in head to tail elastically interengaging relationship to form a rearwardly directed opening adapted to engage the weft thread and to draw it along with it and said weft drawing member during the receding movement of the latter, said blades being rigidly secured each to one of the longitudinal ends of the elongated recess in the weft-drawing member and overlapping each other through a portion of their length above said recess, the upper blade having a free end forming a nose raised in the direction of the rear end of the weft-drawing member, the longitudinal outline of said upper blade merging gradually into contacting relationship with the lower blade to provide for a transverse contacting plane between the two blades, a boss formed on the upper surface of the lower blade in transverse alignment with a point of the upper blade slightly to the front of the nose on the latter and registering with a longitudinal line of the weft drawing member located between the raised nose of the upper blade and the vertical flange of the weft drawing member and stationary means cooperating with said boss to lower the lower blade and thus release the thread engaged between the blades for a predetermined position of the weft drawing member.

10. In a shuttleless weaving loom, the provision of a weft drawing member provided with an elongated recess and with a depressed section formed in the edge of the weft drawing member and located in transverse alignment of said recess, said weft drawing member being adapted to reciprocate into and out of the shed formed in said loom, means feeding a weft thread over the front end of the weft drawing member through the depressed section thereof when the weft drawing member has passed completely through the shed and starts to return towards the weaving line inside the shed, a clamping member including two superposed blades located in head to tail elastically interengaging relationship to form a rearwardly directed opening adapted to engage the weft thread and to draw it along with it and with said weft

drawing member during the receding movement of the latter, said blades being rigidly secured each to one of the longitudinal ends of the elongated recess in the weft drawing member and overlapping each other through a portion of their length above said recess, the upper blade having a free end forming a nose raised in the direction of the rear end of the weft drawing member, the longitudinal outline of said upper blade merging gradually into contacting relationship with the lower blade to provide for a transverse contacting plane between the two blades, a cutting element rigid with the upper blade and located very near the edge of the latter facing the line along which the fabric is being woven and fitting inside the depressed section formed in the edge of the weft drawing member, a stud extending across the transverse contacting plane between the two blades, said stud being adapted to limit the engagement of the thread between the two blades.

11. In a shuttleless weaving loom, the provision of means acting on the warp threads to form a shed, a weft drawing member having at least in its front section an L-shaped cross-section including a horizontal shoe flange and a vertical flange, the said vertical flange adapted to hold the warp sheet away from clamping member located on horizontal flange, the breadth of both flanges decreasing gradually towards the tip of the weft drawing member, said weft drawing member being provided with an elongated recess in its lower flange and adapted to reciprocate into and out of the shed formed in the loom, a clamping member including two superposed blades located in head to tail elastically interengaging relationship to form a rearwardly directed opening adapted to engage the weft thread and to draw it along with it and said weft drawing member during the receding movement of the latter, said blades being rigidly secured each to one of the longitudinal ends of the elongated recess in the weft drawing member and overlapping each other through a portion of their length above said recess, the upper blade having a free end forming a nose raised in the direction of the rear end of the weft drawing member, the longitudinal outline of said upper blade merging gradually into contacting relationship with the lower blade to provide for a transverse contacting plane between the two blades, a boss formed on the upper surface of the lower blade in transverse alignment with a point of the upper blade slightly to the front of the nose on the latter and registering with a longitudinal line of the weft drawing member located between the raised nose of the upper blade and the vertical flange of the weft drawing member, a stationary slope cooperating with the boss on the lower elastic blade to space apart the blades of the clamping member at the end of the stroke of the weft drawing member by lowering the lower blade and means for adjustably shifting said slope with reference to the path of the weft drawing member in longitudinally and transverse directions and in proximity with said path.

12. In a shuttleless weaving loom, the provision of means acting on the warp threads to form a shed, a weft drawing member carrying a weft clamping member and having at least in its front section an L-shaped cross-section including an horizontal shoe flange and a vertical flange, the said vertical flange adapted to hold the warp sheet away from the weft clamping member located on horizontal flange the breadth of both flanges decreasing gradually towards the tip of the weft drawing member, said weft drawing member being provided with an elongated recess in its lower flange and adapted to reciprocate into and out of the shed formed in the loom, a clamping member including two superposed blades located in head to tail elastically interengaging relationship to form a rearwardly directed opening adapted to engage the weft thread and to draw it along with it and said weft drawing member during the receding movement of the latter, said blades being rigidly secured

each to one of the longitudinal ends of the elongated recess in the weft drawing member and overlapping each other through a portion of their length above said recess, the upper blade having a free end forming a nose raised in the direction of the rear end of the weft drawing member, the longitudinal outline of said upper blade merging gradually into contacting relationship with the lower blade to provide for a transverse contacting plane between the two blades, a boss formed on the upper surface of the lower blade in transverse alignment with a point of the upper blade slightly to the front of the nose on the latter and registering with a longitudinal line of the weft drawing member located between the raised nose of the upper blade and the vertical flange of the weft drawing member, a stationary slope cooperating with the boss on the lower elastic blade to space apart the blades of the clamping member at the end of the stroke of the weft drawing member by lowering the lower blade and means for adjustably shifting said slope with reference to the path of the weft drawing member in longitudinally and transverse directions and in proximity with said path, a plurality of weft feeding guides adapted to feed selectively different wefts to the clamping member, said guides being located in adjacent relationship along a line parallel with the path followed by the weft drawing member near the tip thereof, and means for raising and lowering selectively each guide into a position such that its output opening lies in the vicinity of the edge of the woven fabric on the side facing the point of engagement of the weft into the latter, at a point lying in the path of the interval between the vertical flange of the weft drawing member and the nose of the upper blade of the clamping member and underneath the level of said nose.

13. In a loom, the combination of a stationary weft supply, means for laying single picks fed by said supply inside the shed, means for beating up the pick inside the shed, means controlling the formation of the shed, a main shaft arranged vertically in the median plane of the loom, a cam controlling the pick beating up forming means and controlled by said vertical shaft, a horizontal crank radially rigid with the main vertical shaft, a horizontal slideway extending laterally of the loom, a slider adapted to reciprocate inside said slideway, a horizontal rocking arm pivotally secured through one end to said slider, a connecting rod operatively connecting the crank on the vertical shaft with said rocking arm, means whereby the slider controls the weft laying means and means wherethrough the vertical shaft controls the shed forming means.

14. In a loom, the combination of a stationary weft supply, means for laying single picks fed by said supply inside the shed, means for beating up the pick inside the shed, means controlling the formation of the shed, a main shaft arranged vertically in the median plane of the loom, a cam controlling the pick beating up forming means and controlled by said vertical shaft, a horizontal crank radially rigid with the main vertical shaft, a horizontal slideway extending laterally of the loom, a slider adapted to reciprocate inside said slideway, a horizontal rocking arm pivotally secured through one end to said slider, a carrier holding the rocking arm at its end opposed to that engaging the slider and pivotally secured to a stationary point, a connecting rod operatively connecting the crank on the vertical shaft with said rocking arm, means whereby the slider controls the weft laying means and means wherethrough the vertical shaft controls the shed forming means.

15. In a loom, the combination of a stationary weft supply, means for laying single picks fed by said supply inside the shed, a batten for beating up the pick inside the shed, means controlling the formation of the shed, a main shaft arranged vertically in the median plane of the loom, cams controlling directly the shed forming means and controlled by said vertical shaft, a horizontal crank radially rigid with the main vertical shaft, a connecting rod lying in a horizontal plane and operatively connecting the weft laying means with said horizontal crank, a horizontal plate rigid with the vertical shaft at a point of its length and provided on one of its horizontal surfaces with a cam groove, a roller engaging said cam groove and a horizontally sliding rod carrying said roller and coupled with the medial section of the batten to control the latter.

16. In a loom, the combination of a stationary weft supply, means for laying single picks fed by said supply inside the shed, a batten for beating up the pick inside the shed, means controlling the formation of the shed, a main shaft arranged vertically in the median plane of the loom; cams controlling directly the shed forming means and controlled by said vertical shaft, a horizontal crank radially rigid with the main vertical shaft, a connecting rod lying in a horizontal plane and operatively connecting the weft laying means with said horizontal crank, a single cam rigid with the vertical shaft at a point of its length and forming a flywheel, a power unit, means for operatively connecting the latter with the periphery of the flywheel cam to make the latter revolve together with the vertical shaft and means wherethrough said cam controls the batten.

17. In a loom, the combination of a stationary weft supply, means for laying single picks fed by said supply inside the shed, means for beating up the pick inside the shed, reciprocatory means controlling the formation of the shed, a main shaft arranged vertically in the median plane of the loom, a gear wheel coaxially rigid with the lower end of the vertical shaft, an auxiliary shaft controlled by the said gear wheel and extending underneath and perpendicularly to the plane of movement of the shed forming means and a set of cams rigid with said auxiliary shaft, and adapted to control said recprocatory shed forming means, a horizontal crank radially rigid with the main vertical shaft, a connecting rod lying in a horizontal plane and operatively connecting the weft laying means with said horizontal crank and means wherethrough the vertical shaft controls the pick beating up means.

18. In a loom, the combination of a stationary weft supply, means for laying single picks from the said supply inside the shed, a harness controlling the warp threads and constituted by vertical healds and cooperating flat parallel vertically shiftable heald carriers, a main shaft arranged vertically in the median plane of the loom, a batten adapted to beat up the pick inside the shed, a crank rigid with the upper end of said shaft, means wherethrough said crank controls the weft laying means, a single cam rigid with the shaft at a point of its length and controlling the batten, a gear wheel rigid with a point of the shaft near its lower end, an auxiliary shaft controlled by the said gear wheel and extending underneath and perpendicularly to the planes of the heald carriers and a set of auxiliary cams rigid with said auxiliary shaft, located respectively in the planes of the corresponding heald carriers, engaging the medial section of the underside thereof and adapted to control their reciprocation.

19. In a loom, the combination of means for controlling the formation of the shed, a weft drawing member for laying single picks, a main shaft arranged vertically in the median plane of the loom, a batten adapted to beat up the pick inside the shed, means wherethrough the main shaft controls the batten and the shed forming means, a horizontal crank rigid with the upper end of the main vertical shaft a connecting rod lying in a horizontal plane and controlled by said horizontal crank, a weft laying member controlled by said connecting rod and adapted to be shifted longitudinally through the shed, said weft laying member moving throughout the breadth of the location of the fabric which is being woven, an elastic weft clamping member carried by said

weft drawing member adapted to engage and to cut the weft thread at a point slightly to the rear of the selvedge of the fabric which is being woven facing the front of the weft drawing member, the opening of said clamping member rigid with the said weft drawing member facing the rear end of the latter to provide for engagement with the weft thread and for its insertion in the shed through the receding movement of said weft drawing member away from said selvedge.

20. In a shuttleless weaving loom, the combination of means acting on the warp threads to form a shed, means feeding weft into one side of the shed, a weft drawing member having at least in its front section an L shaped cross-section including a horizontal shoe flange and a vertical flange, the said vertical flange adapted to hold the warp threads away from clamping member located on horizontal flange, the breadth of both flanges decreasing gradually towards the tip of the weft drawing member, said weft drawing member being adapted to be shifted forwardly towards the location of the selvedge facing the weft feeding means and the back throughout the breadth of the location of the fabric which is being woven, an elastic weft clamping member carried by the horizontal flange of said weft drawing member and opening in the direction of the rear end of the weft drawing member away from the said selvedge, said clamping member being adapted to engage and carry rearwardly along with it the weft thread fed by the weft-feeding means to lay said thread in the shed, the clamping member including cutting means adapted to sever the pick which is being laid from the pick which has been precedingly laid at a point slightly on the inside of said selvedge facing the weft feeding means, means carried by the weft drawing member adapted to turn back or to complete the turning back into the shed of the severed end of the precedingly laid pick, means for beating up the pick inside the shed, a main shaft arranged vertically in the median plane of the loom, a cam controlling the pick beating up forming means and controlled by said vertical shaft, a horizontal crank radially rigid with the main vertical shaft, a connecting rod lying in a horizontal plane and operatively connecting the weft drawing member with said horizontal crank and means wherethrough the vertical shaft controls the shed forming means.

21. In a shuttleless weaving loom, the combination of means acting on the warp threads to form a shed, means feeding weft into one side of the shed, a weft drawing member carrying a weft clamping member having at least in its front section an L shaped cross-section including a horizontal shoe flange and a vertical flange, the said vertical flange adapted to hold the warp threads away from clamping member located on horizontal flange, the breadth of both flanges decreasing gradually towards the tip of the weft drawing member, said weft drawing member being adapted to be shifted forwardly towards the location of the selvedge facing the weft feeding means and then back throughout the breadth of the location of the fabric which is being woven, an elastic weft clamping member carried by the horizontal flange of said weft drawing member and opening in the direction of the rear end of the weft drawing member away from the said selvedge, said clamping member being adapted to engage and carry rearwardly along with it the weft thread fed by the weft-feeding means to lay said thread in the shed, the clamping member including cutting means adapted to sever the pick which is being laid from the pick which has been precedingly laid at a point slightly on the inside of said selvedge facing the weft feeding means, bristles carried by one end of the weft drawing member and extending in the direction facing the bottom of the shed and adapted to turn back or to complete the turning back into the shed of the severed end of the precedingly laid pick, a slide-way extending laterally of the loom and bearing a short channel formed laterally the location of the shed in the loom and through which the weft drawing member is shifted into the shed, a slider slidingly engaging said slideway and connected with the corresponding end of the weft drawing member and a longitudinal shoe of friction resisting material lining the outside of the vertical flange of the said weft drawing member and fitted between said flange and the inside of the channel to guide the weft drawing member, means for beating up the pick inside the shed, a main shaft arranged vertically in the median plane of the loom, a cam controlling the pick beating up means and controlled by said vertical shaft, a horizontal crank radially rigid with the main vertical shaft, a connecting rod lying in a horizontal plane and operatively connecting the said slider with said horizontal crank and means wherethrough the vertical shaft controls the shed forming means.

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