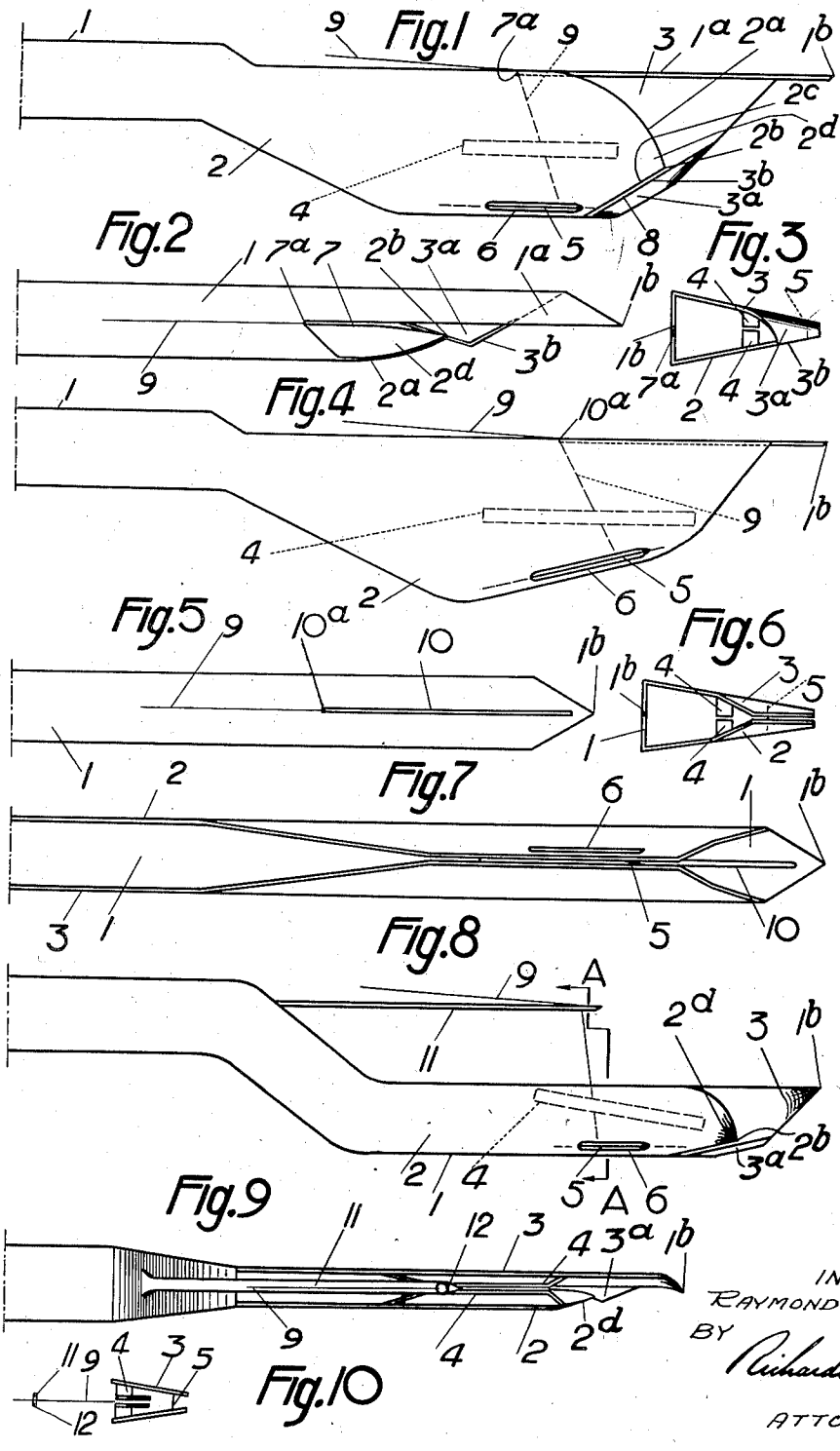
May 10, 1938. R. DEWAS 2,116,620

WEFT FEEDER FOR WEAVING LOOMS

Filed May 3, 1935 2 Sheets-Sheet 1



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WEFT FEEDER FOR WEAVING LOOMS

Filed May 3, 1935 2 Sheets-Sheet 2

Fig.11

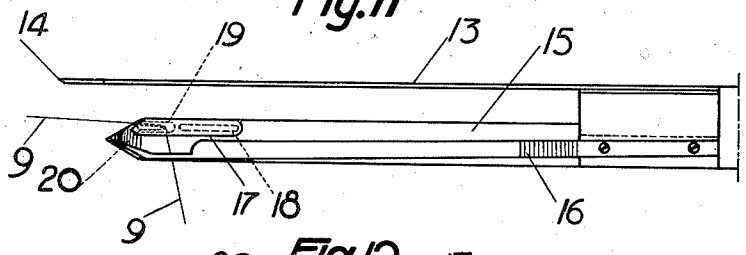


Fig.12

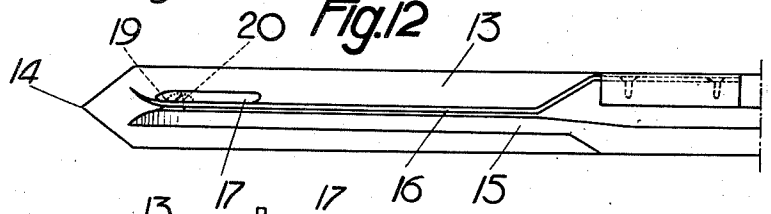


Fig.13

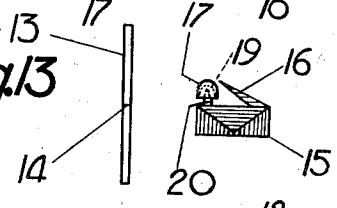


Fig.14



Fig.15

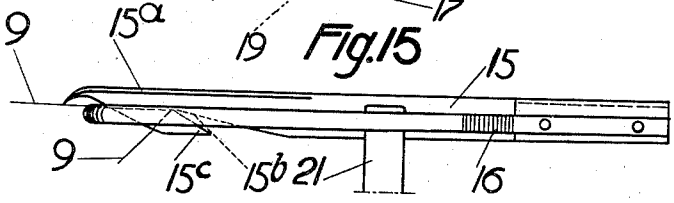


Fig.16

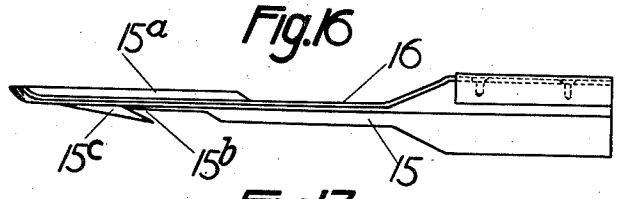
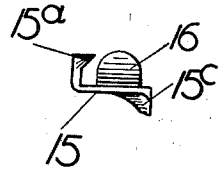


Fig.17



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2,116,620

WEFT FEEDER FOR WEAVING LOOMS

Raymond Dewas, Amiens, France

Application May 3, 1935, Serial No. 19,576
In France June 2, 1934

15 Claims. (Cl. 139—127)

The invention relates to thread carrier devices of the kind described in Patent No. 2,072,161 and has for its purpose, particularly when such a device is intended to be used as a weft-carrier in needle-weaving looms with continuous supply of weft, to introduce improvements and alterations in the construction of the conveying and pulling members arranged at the ends of the needles, with a view to enabling them to function in a more certain manner, with greater rapidity and at the same time to be more suitable for use with delicate wefts, that is to say with threads which are fragile by their very nature or by their fineness or as the result of the irregularities which they may display, etc.

These improvements and modifications of construction are directed to, among other purposes, particularly:—

So far as the conveying needle is concerned, the said improvements and modifications deal with the carrying into effect of the combination of the triangular notched covering plate with the branches of the conveying member which carries the thread clamp and the cutting blade, which combination allows of the employment of a single member suitably shaped for the construction of the whole of the said conveying member, and also with the realization of good threading and also with the obtaining of a narrow selvedge.

And, so far as the pulling needle is concerned, the said improvements and modifications deal with the attachment to this needle of a member which prevents gliding or slipping, as well as with the realization, not only of the catching of the thread taking place when the needles meet one another, but also with this catching taking place when the needles separate from one another.

The conveying and pulling members, improved in accordance with the invention, constitute variants in construction of the "thread carrier device" which is described in the patent mentioned above and are described and shown hereafter, by way of example and diagrammatically in the attached drawings, in which:—

Figure 1 is a plan view from above of one variant of construction of a conveying member arranged at the end of a needle of a needle-weaving loom;

Figure 2 is an elevation showing the side of the conveying member which faces the reed; and

Figure 3 is an end elevation showing the right hand end of Figure 2.

Figures 4, 5, 6 are views corresponding to Figures 1, 2, 3, respectively and show a second variant of construction of a conveying member; and

Figure 7 is an elevation showing the side of the said member which faces the fell of the fabric.

Figure 8 is a plan view from above of a third variant of construction of a conveying member.

Figure 9 is an elevation showing the side of the said member, facing the reed; and

Figure 10 is a sectional view taken on the line A—A of the end of this conveying member.

Figure 11 is a plan view from above of one variant of construction of a pulling member, arranged for the catching of the thread when the needles advance towards one another.

Figure 12 is an elevation showing the side of the said member which faces the fell of the fabric;

Figure 13 is an end elevation on an enlarged scale of the fork of the said member; and

Figure 14 is a fragmentary elevation showing the side of the said pulling member which faces the reed, the protecting branch sliding along the reed and the springy branch of the clamp not being shown in order to make the drawings more clear.

Figure 15 is a plan view from above of a variant of construction of a pulling member arranged for the catching of the thread when the needles separate from one another, the protecting branch which slides along the reed not being shown.

Figure 16 is an elevation showing the side which faces the fell; and

Figure 17 is an end view to an enlarged scale of the fork of the said member.

The first variant in the construction of the conveying member, (Figures 1 to 3) is constituted by a piece of sheet steel cut in accordance with a particular template in such a way that, after the bending over of the edges, the middle part of the plate forms the side 1 facing the reed, and that the bent over edges 2 and 3 form the branches between which are fixed, in any suitable manner, the springy clamp 4, as well as, beneath the latter, the cutting blade 5 part of which appears in the cleaning opening 6 located in one of the bent over sides of the sheet.

The front part 1 of the metal sheet is cut out in such a manner that, after bending over the lateral sides 2 and 3, the edge of the side 3 cut on the slant projects beyond the edge of the side 2 to a certain extent, and that the middle part 1, reduced in width as shown at 1a, similarly projects, to a certain extent, beyond the edge of the side 3, in such a way as to form the point or the beak 1b of the conveying member.

The bent over edge of the side 2, which is

rounded at 2a and forms a beak at 2b, is followed by a receding edge 2c; the front part of the side 2, thus shaped, is bevelled at 2d in such a way that the lower part 3a of the edge 3, which is folded back upon itself conceals the beak 2b by its raised edge 3b and thus prevents the floating warp threads from entering the opening 8 which is left between the two branches thus formed by the sides 2 and 3, cut out and bent over.

The rounding 2a of the edge 2 joins, at its upper part, with the middle part 1, in which a notch 7 is located, the bottom 7a of which forms the point of support for the weft thread 9 which is thus stretched between the said point and the springy clamp 4.

The working of this conveying needle is the same as that of the conveying needle described in the above-mentioned patent.

According to the second variant of construction (Figures 4 to 7) the conveying member is constituted in a similar fashion to that in the first variant, with these differences that the middle face 1 maintains its entire width and has an opening 10, in which is threaded the weft thread 9, and the bottom 10a of which forms the point of support for this thread which is stretched between the said point and the springy clamp 4; this slot may be reduced in size to such an extent as to consist merely of an eyelet.

The front edges of the sides 2 and 3 constitute, below the middle part 1a forming a beak at 1b, an opening which conducts the weft thread between the branches 4 of the springy clamp and on to the cutting blade 5.

The parts which continue these edges, and face the fell, are so shaped as to allow of the mounting of the cutting blade 5 in such a position that the said blade passes close to the point of the fell of the cloth.

This variant in the form of construction offers the advantage of enabling the weft thread to remain threaded permanently, which protects the thread, when it is caught at the entry of the shed, from the choking incidental to its passage in the slot disposed between the branches 2 and 3 and this facilitates the use of certain delicate threads.

Further, the position of the cutting blade 5 offers, when the needles accompany, during its movement, the slay of the loom, especially when the said slay is put into action by the usual crank, the advantage that it is possible to obtain a very narrow selvedge, this arrangement being applicable to the other variants including the form of construction described in the above-mentioned patent.

In the case of these forms of construction, it is preferable that the weft thread should be stretched tightly between the point of support and the point of the fell of the cloth, at the moment of the catching of the thread by the conveying member.

For this purpose a tension device may be provided; preferably it can consist of an arm fixed to the connecting rod of the crank the end of which has an eyelet through which the thread can pass in order to avoid the employment of driven parts.

Owing to the presence of this tension device and as a result of the angular displacement of the connecting rod, the eyelet is displaced relatively to another or several other eyelets which are fixed to the slay.

As regards the third variant of construction of the conveying member (Figures 8 to 10), this is constituted also of a metal sheet with bent over edges 2 and 3, with this difference that the middle part 1 faces the fell of the cloth.

Above the branches 2 and 3 and in the median plane or approximately so is arranged a needle 11, which is fixed to the metal sheet by its end in any suitable way, the other end having an eyelet 12, through which the weft thread is threaded permanently; this eyelet, which is situated above the clamp, constituting the point of support for the thread, the eyelet being of any shape and dimensions and assuming, if necessary, the shape of a slot.

The advantage of the point of support, formed by the eyelet 12 at the end of the needle 11, is that certain delicate warps are submitted to less hardship, in view of the fact that the metal sheet of the conveying member is of much reduced dimensions and no longer has to overlap the clamp of the pulling needle at the moment of the exchange of the weft thread.

In the event where the threading of the thread is not to be permanent, the eyelet 12 may be replaced by a notch, the bottom of which will form the point of support for the thread.

It is to be understood that, in the forms of construction given above, the metal sheet which forms the conveying needle may be perforated as much as may be necessary, with a view, among other purposes, to a reduction of the weight.

With regard to the first variant of construction of the pulling member, (Figures 11 to 14), which is equally applicable to the form of construction of the conveying needle described in the patent mentioned above, as with the variants before described, this variant, which has been devised with a view to effecting the exchange of the thread at the moment of the meeting of the two needles, is constituted, as in the form of construction described in the application of patent mentioned above, of a fork with two prongs which terminate the pulling needle, one of which, 13, with its point 14, prolongs the surface of the needle facing the reed and acts as a protector, whilst the other itself is formed as a fork, with the characteristic that the prong, 15, is rigid, whilst the other, 16, is springy.

The springy prong 16 is shaped in such a fashion that the releasing blade moves it aside when this latter is still at a certain distance from the point at which the thread is maintained between the springy prong and the rigid prong.

The end of the springy prong 16 is reduced in width so as to provide a gap between its inner edge and a part for threading and holding so as to facilitate the threading, in the said part, of the end of the weft thread taken from the conveying needle at the moment when the two needles meet.

This part, which is situated on the inner edge of the rigid prong 15, and close to its end, comprises a sort of beading 17 like the flange of a rail, of solid metal, which is prolonged at the lower bead part by a flat projection forming a support 18, the edge of which is fixed on the rigid prong 15. The lower forward face of this beading is furnished with a recess 19 into which enters freely the point of a hook 20 of saw-tooth shape, which is held by its base on the rigid prong 15.

As a result of this form of construction the floating end of the weft thread runs no risk of remaining in the selvedge in the form of a loop; in addition to this, whilst working with a minimum of tension, it is possible to obtain a selvedge as short as may be desired, whatever may

be the speed of the needle and the inertia of the thread; finally the thread is held better in this form of clamp, the pull of the thread taking place across the breadth of the clamp, perpendicularly or obliquely, as it may occur in the clamp of the conveying member.

When a pulling needle of this kind meets a conveying needle of one of the forms of construction already described the thread, stretched between the point of support and the springy clamp **4** of the conveying member, enters between the branches **15** and **16** of the pulling needle at the same time as it passes over the tooth **20**.

When the pulling member recedes towards the selvedge and is within a few centimetres from it, the releasing and cleaning blade moves the springy prong **16** away from the rigid prong **15**, thus releasing the end of the weft thread which is gripped thereby.

As the pulling member continues its movement out of the shed, the end of the weft thread slides along the length of the tooth **20** and turns round it, thus preventing it from looping itself in the selvedge.

The second form of construction of the pulling member, (Figures 15 to 17) which is also applicable to all the forms of the conveying needles previously described, has been devised with a view to effecting the exchange of the thread when the needles separate. It is constituted in similar fashion to the first form of construction above described, with this difference, however, that the end of the springy prong **16** is not reduced in width and that the retaining member **17** is replaced by a hook instead, which moreover may be transformed into a threading member in the spirit of the first form of construction above described.

With a view to the catching of the thread when the needle recedes, the end of the rigid prong **15** has an edge **15***a* bent at right angles on the side which faces the reed, the opposite edge being cut away so as to present a notch **15***b* with the shape of a hook **15***c*, the extreme tip of which is bent back slightly below the plane of the said prong.

With this form of construction, the exchange of the thread takes place as follows:—

When this pulling needle meets a conveying needle similar to one or other of the forms of construction described, the thread, which is stretched between the point of support and the springy clamp **4**, comes into contact along the edge of the hook **15***c* and falls into the notch **15***b*.

As soon as the two needles recede, the part of the thread which is situated between the hook and the point of support lodges in the bottom of the notch **15***b* and is drawn under the pulling member, approximately in the axis of the whole, whilst that part of the thread which is situated between the hook and the springy clamp **4** of the conveying member passes under the springy prong **16** which holds it so as to draw the thread out of the said clamp **4**.

When the needle reaches a few centimetres from the selvedge, the releasing blade **21** moves the springy prong **16** away, thus allowing the thread to slide, as it passes, along the notch and turning round it, the said thread being thus prevented from looping itself in the selvedge.

It is to be observed that with this type of pulling needle it is possible to omit the protecting prong **13**, which slides along the reed, and consequently to alter, among other things, the margin **15***a*.

By the use of these two forms of construction of pulling needles, it results that they work in accordance with a method of operation which in principle is as follows:—

(*a*) At the moment of the exchange, the thread enters the fork with the springy prong and a part forming a retaining point, on which the pull of the thread is exerted, in such a way that, when once the exchange has been completed, the thread commencing with its end, is first maintained between the springy prong and the rigid prong and is then supported by the retaining point.

(*b*) At the moment of the release, the releasing blade moves the springy prong away from the rigid prong of the fork, thus releasing the thread well before its arrival at the place where the said thread is maintained by the said springy prong, thus securing the unthreading of the end of the thread round the retaining point.

This method of operation may be obtained by other forms of construction of the pulling members; in the same way it is to be understood that, without departing from the spirit of the invention, alterations, improvements, and additions may be introduced, as well as the employment of equivalent means.

For example: the pulling clamp may be supported by the protecting branch **13**, to which it would be connected by suitably arranged supports which may be springy or not, so as to allow the needle **11** having the eyelet **12** to pass between them according to the third form of construction of the conveying member.

In order to advance the moment when the branches of the clamp of the pulling member are moved aside by the releasing blade, small bosses may be provided on one or on both of the inner faces of the prongs.

In the same way, in the place of and instead of the releasing blade, it would be possible to make use of external bosses or stops fulfilling the same purpose.

Again, it is possible to substitute, for the springy fork of the pulling needles, a clamp formed as a kind of hairpin with a raised head so as to alloy of the passage of the releasing blade, the turned up part of the head of the hairpin holding and conveying, during unthreading, the end of the thread out of the selvedge.

In certain cases the rigid prong of the pulling member may also be springy.

Similarly, it will be possible to provide threading and holding members, disposed on the rigid prong, on each side of the end of the springy prong, arranged for this purpose.

When it is necessary to clean the clamp of the conveying member, it will be possible to arrange a cleaning blade outside the entry selvedge, the said member being suitably arranged for the purpose, or to make use of a blade mounted upon the pulling member in such a way that it will enter into the conveying clamp as soon as the pulling clamp has taken a sufficient hold of the thread, this blade having besides the advantage of assisting the threads to leave the conveying clamp without effort when weaving with delicate threads. It is further to be understood that, as regards the conveying members and also the pulling members, they may be made, in whole or in part, of moulded material (metal, plastic or otherwise) instead of being made of sheet metal as stated above.

In the device constructed in accordance with the principles of the present invention, the threading of the end of weft thread **9** takes place between the thread clamp **4**, and is unthreaded

every time the pulling needle takes it off to convey it outside the right selvedge of the shed.

As shown in Figure 1, when the thread 9, stretched between the bottom 7a (point of support) of the notch 7 and the clamp 4, is taken off by the clamp 15, 16 of the pulling needle, said thread is unthreaded from the clamp 4 as the pulling needle goes back towards the right selvedge and is then stretched between the clamp 15, 16 and the bobbin.

As shown in Figures 4, 8, and 10, when the thread 9, stretched between the bottom 10a of the rectilinear opening 10 or of the circular opening or eyelet 12, and the clamp 4, is taken off by the clamp 15, 16 of the pulling needle, said thread is unthreaded from the clamp 4, and the pulling needle goes back toward the right selvedge, but it still remains passed through the opening 10, abutting against its fore end near the point 10, or through the eyelet 12.

Since the conveying needle proceeds rearwardly in relation to the left selvedge, the edge of the fore end of slot 10 or the edge of the eyelet 12 will rub and glide along the thread 9 stretched between the bobbin and the clamp 15, 16 of the pulling needle which is running toward the right selvedge.

When the pulling needle has reached its destination, out of the right selvedge of the shed, and the conveying needle is out of the shed in front of the left selvedge, the pick having been beaten up by the sley, the thread stands stretched between the left point of the fell of the cloth and the bobbin, passing through the slot 10 and abutting against its fore end, or passing through the eyelet 12.

When the conveying needle enters again into the shed for a next pick, the clamp 4 seizes this stretched thread 9.

The advantage is that when weaving fine threads, they are not rubbed by the edges of the notch 7 (Figure 2) and therefore do not run the risk of being worn out or cut.

The provision of the member 17, 18, 19, 20 has for its purpose to compel the thread caught between the prongs 15, 16 of the springy clamp of the pulling needle (Figs. 11 and 14) not to glide or slip freely between said prongs 15, 16 when the needle arrives at the end of its receding stroke.

The inconvenience of the free slipping was that the end of the thread was freed from the clamp too early, and, therefore, it remained within the selvedge in a wavy or scrolled state, the end of the thread not extending outside the selvedge, and consequently making faults.

Due to the provision of the member 17, 18, 19, 20, the end of the thread when the pulling needle emerges from the shed is compelled to turn around said member or to rub against it, somewhat like a rope around a capstan or a bollard, with a snubbing action.

Then the end of the thread, although freed from the clamp, is compelled to unwind itself whilst the needle is emerging from the shed, and therefore, the end of said thread also emerges from the shed and is left pending outside the selvedge.

What I claim is:

1. In looms of the type having a reed and a pair of reciprocable needles movable toward and away from one another for laying the pick in the shed a conveying member forming the end of one of the needles, said member having one part forming the side facing the reed and another part forming a continuation of the first-mentioned part and having a shorter and a longer side, the second-mentioned part comprising a pair of prongs; a resilient clamp situated between said prongs, and a cutting blade situated between said prongs, the front edge of one of said prongs projecting beyond the front edge of the other prong, the first-mentioned part having its width reduced for a part of its length so as to form a point projecting beyond said longer side; an opening having the form of a notch being formed in the first-mentioned part approximately at the height of said shorter side, the bottom of said notch forming a point of support for the thread.

2. A device in accordance with claim 1, wherein the part of the conveying member facing the reed has an opening having the form of a slot, and wherein the front edges of the part forming the prongs are shaped in such a way as to form a notch between the point of the part facing the reed and the fell of the fabric, said notch leading the thread between the branches of the resilient clamp.

3. In looms of the type having a reed and a pair of reciprocable needles movable toward and away from one another for laying the pick in the shed a conveying member forming the end of one of the needles, said member having one part forming the side facing the reed and another part forming the continuation of the first-mentioned part and having a shorter and a longer side, the second-mentioned part comprising a pair of prongs; a resilient clamp situated between said prongs, the front edge of one of said prongs projecting beyond the front edge of the other prong, the first-mentioned part having its width reduced for a part of its length so as to form a point projecting beyond said longer side, and a needle having one end attached to said conveying member and another end forming an eyelet situated between said prongs and the reed, an edge of said eyelet constituting a point of support for the thread between the resilient clamp and the reed.

4. In looms of the type having a reed and a pair of reciprocable needles movable toward and away from one another for laying the pick in the shed a conveying member forming the end of one of the needles, said member having one part forming the side facing the reed and another part forming a continuation of the first-mentioned part and having a shorter and a longer side, the second-mentioned part comprising a pair of prongs; a resilient clamp situated between said prongs, a cutting blade situated between said prongs, the front edge of one of said prongs projecting beyond the front edge of the other prong, the first-mentioned part having its width reduced for a part of its length so as to form a point projecting beyond said longer side, and a needle integral with the conveying member, said needle having an opening in the form of a notch, the bottom of which constitutes a support for the thread.

5. A device in accordance with claim 1, wherein the parts of the edges of the prongs facing the fell of the cloth are so limited as to permit the mounting of the cutting blade in such position that said blade passes closely to the fell of the cloth.

6. In looms of the type having a reed and a pair of reciprocable needles movable toward and away from one another for laying the pick in the shed a pulling member carried by one of said needles for the exchange of the thread when the needles meet, comprising a fork having two prongs, one of said prongs being resilient and the

other rigid, a member for retaining and untwisting the thread, said member being situated close to the end of one of said prongs and comprising a beading and a support provided at its lower rear part and attaching it to the last-mentioned prong, the lower forward face of the beading having a recess; and a tooth fixed to said prongs, said tooth projecting into said recess.

7. In looms of the type having a reed and a pair of reciprocable needles movable toward and away from one another for laying the pick in the shed a pulling member carried by one of said needles for the exchange of the thread, comprising a fork having two resilient prongs, a member for retaining and untwisting the thread, said member being situated close to the end of one of said prongs and comprising a beading and a support provided at its lower rear part and attaching it to the prong, the lower forward face of the beading having a recess; and a tooth fixed to said prongs, said tooth projecting into said recess.

8. In looms having a reed, a supply bobbin and a pair of reciprocable needles movable toward and away from one another for laying the pick in the shed, a conveyor member forming the end of one of said needles, said member comprising two branches, forming a pair of prongs, a resilient clamp situated between said prongs, and means carried by said conveyor member upon that surface thereof which faces the reed, said means forming a support for the weft thread stretched between said clamp and the supply bobbin.

9. In looms having a reed, a supply bobbin and a pair of reciprocable needles movable toward and away from one another for laying the pick in the shed, a conveyor member forming the end of one of said needles, said member comprising two branches, one of said branches forming a pair of prongs, a resilient clamp situated between said prongs, and means carried by said conveyor member upon that surface thereof which faces the reed, said means having edges constituting an opening and supporting the weft thread stretched between the clamp and the supply bobbin.

10. In looms having a pair of reciprocable needles movable toward and away from one another for laying the pick in the shed, a conveyor member forming the end of one of said needles, said member comprising two branches forming a pair of prongs, a resilient clamp situated between said prongs and a cutting blade situated between said prongs.

11. In looms, in combination with a pair of reciprocable needles movable toward and away from one another for laying the pick in the shed and passing each other substantially in the middle of the shed; a conveyor member carried by one of said needles, and a pulling member carried by the other one of said needles, said pulling member comprising two branches constituting a prong adapted to grip the weft held by the conveyor member when said pulling member meets said conveyor member, and pull the weft through said shed on the return movement of the pulling member.

12. In looms having a pair of reciprocable needles movable toward and away from one another for laying the pick in the shed, a conveyor member and a pulling member carried by separate needles and constructed to cooperate, said pulling member comprising two branches adapted to grip the weft held by said conveyor member and pull it through said shed on the return movement of the pulling member, and means on one of said branches for retaining and untwisting the weft thread.

13. In looms of the type having a shed and a pair of reciprocable needles moving toward and away from each other for laying the pick in the shed, a pulling member carried by one of said needles and comprising a fork for the exchange of thread when the two needles after having met in the shed move away from each other, one of the prongs of said fork having two prongs, one of said last-mentioned prongs being resilient and the other rigid, said rigid prong having an end which is raised at a right angle and which extends closely and parallel to the corresponding end of the resilient prong, the opposite edge of said rigid prong being notched to form a hook the dent of which is situated somewhat below the plane of the rigid prong.

14. In looms of the type having a shed and a pair of reciprocable needles moving toward and away from each other for laying the pick in the shed, a pulling member carried by one of said needles and comprising a fork for the exchange of thread when the two needles meet in the shed, one of the prongs of said fork having two prongs gripping the thread, and a releasing blade engaging the last-mentioned prongs and moving them apart to begin to free the thread before said pulling member leaves the shed, said prongs being so shaped that they are moved apart by the releasing blade before it reaches the thread gripped by the prongs.

15. In looms of the type having a reed, a shed, and a pair of reciprocable needles moving toward and away from each other for laying the pick in the shed, a pulling member carried by one of said needles and comprising a fork for the exchange of thread when the two needles meet in the shed, said fork having a protecting prong, a holding prong, and supports integral with said protecting prong and supporting said holding prong, said protecting prong sliding along said reed, and a needle carried by the other one of the first-mentioned needles and adapted to penetrate between said supports.

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