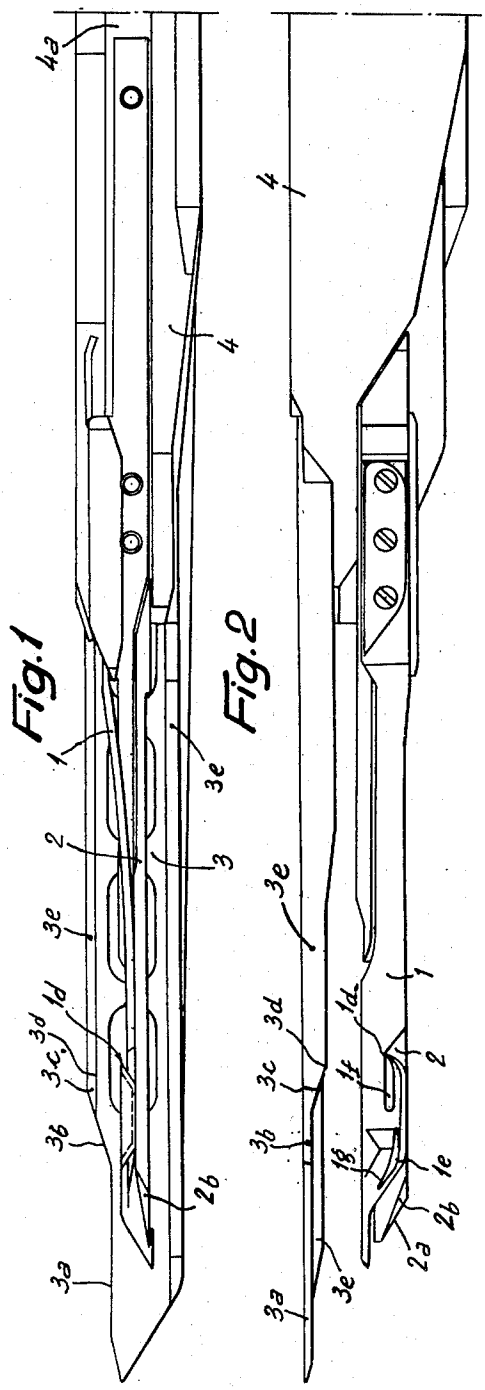
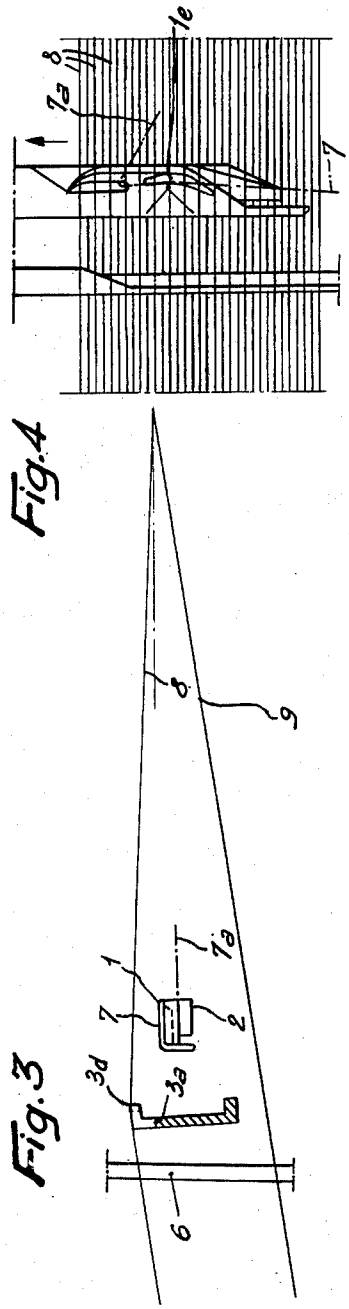
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WEFT-INSERTING DEVICES FOR WEAVING LOOMS

Filed June 14, 1955 2 Sheets-Sheet 1





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Fig.5

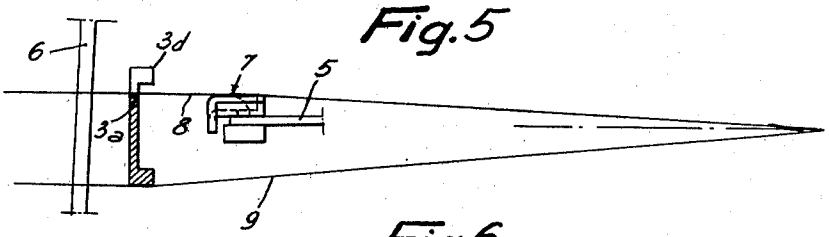


Fig.6

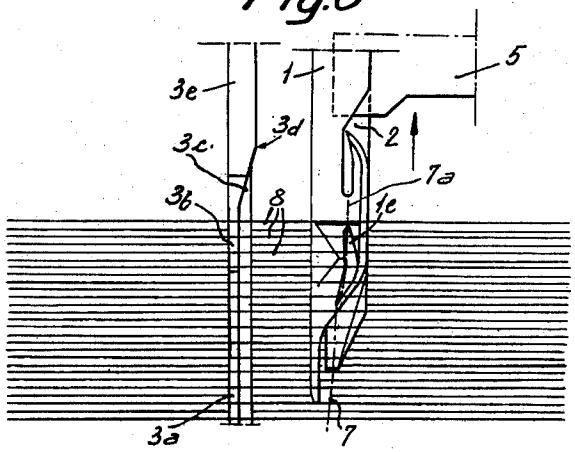


Fig.7

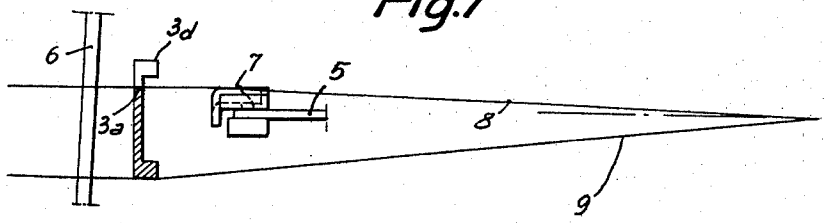
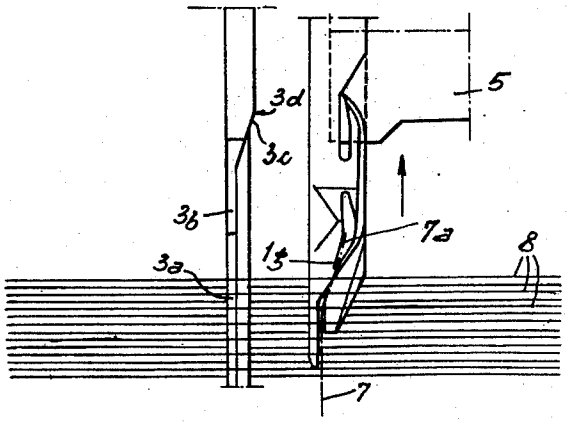


Fig.8



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WEFT-INSERTING DEVICES FOR WEAVING LOOMS

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Application June 14, 1955, Serial No. 515,501

Claims priority, application France June 16, 1954

2 Claims. (Cl. 139—123)

The invention relates to weaving looms with continuous weft-feeding; it concerns the weft-inserting, and in particular the weft-inserting needles, especially pulling needles having a springy clamp of the kind described and shown in my U. S. Patent No. 2,567,993, which are provided with a guard, the dimensions of which exceed, both in length and height, the outer dimensions of the elastic clamp referred to.

Owing to the presence of this guard, the warp threads cannot be caught, neither by the extremities of the branches of the clamp on the pulling needle, when this enters into the shed to meet the conveying needle for exchanging the weft, nor by the hook of said pulling needle during its outward travel off the shed.

Between the moment when the end of the weft thread, freed from the gripping action of the pulling clamp escapes from the longitudinal slit of the springy branch and the moment when (the needle having continued its outward run) the projecting part of the guard gets out of the shed, allowing then, at this very instant, the warp threads of the selvedge to close up again thus immobilizing the end of the said weft thread, there is a lapse of time which, although of extremely short duration, is sufficient for the end of the weft to be inserted without the necessary precision, thus causing irregularities, in or about the selvedge, that are detrimental to the good appearance of the cloth and consequently reduce its value.

The aim of the invention is to control the action of the end of the weft, during the period of time, between the moment it is freed from the clamp and the moment when the guard gets out of the shed. To this end the invention introduces improvements which, while allowing the guard to perform its duty with respect to the warp threads, also causes it to perform a supplementary role in controlling the end of the inserted weft, when released from the grip of the elastic clamp, while the pulling needle is withdrawn off the shed.

The invention also has reference to improvements in the springy branch of the elastic clamp of the pulling needle.

One way of carrying the invention into effect is hereinafter described and schematically shown by way of example in the attached drawings in which:

Fig. 1 is a side elevation, of the side facing the fell of the cloth, of the springy clamp of a pulling needle, including an improved guard according to the invention.

Fig. 2 is a plan view of the arrangement.

Figs. 3 to 8, in three groups of two diagrams each, respectively show a side elevation and plan of the phases of the means controlling the behaviour of the end of the shot weft.

So far as the pulling needle of the kind referred to is concerned, **1** is the springy branch and **2** the rigid branch of the elastic clamp, **3** is the guard, and **4** the arm of the pulling needle made of moulded plastic material, for example, with its lateral longitudinal groove **4***a* for the passage of the releasing blade **5**.

The guard is made of a sheet or strip **3**, of metal or

other material, the height and length of which exceed the external measurements of the elastic clamp **1—2**, and whose upper and lower longitudinal edges **3***e* are bent at right angles as far as the front part. The end of the guard is pointed in order to allow it to perform the dual role of protection and control. Such a guard is, as illustrated in Figs. 1–2 characterised in that the upper edge of the strip **3**, is so shaped, starting from its point that extends beyond the end of the elastic clamp **1—2**, successively to present distinct zones **3***a*, **3***b* and **3***c*.

(*a*) The first zone **3***a*, is horizontal and corresponds to the minimum height of the guard situated below the level of edge **3***e*, acting to prevent the warp threads being caught by the ends of the clamp when the needle enters the shed, as well as when it is withdrawn, at the moment when the clamp and its guard leave the shed, so as to allow the selvedge warp threads of the upper sheet **8** to come into contact with the upper surface of springy branch **1** of the clamp;

(*b*) The second zone, **3***b* is inclined and forms an intermediate plane between the preceding zone **3***a* and the upper edge **3***e*, acting to allow the passage or progressive sliding of the warp threads of the upper sheet **8** from zone **3***a* to zone **3***c*, and vice-versa.

(*c*) The third zone **3***c* links zone **3***b* to the widening part of the upper right angled flange **3***e*, whose width gets greatest at the point **3***d*, situated immediately straight in front of the tip of the hook **1***d* of the springy branch **1**, thus preventing engagement of the selvedge warp threads by the hook, when the clamp is getting off the shed.

In order to perfect, if necessary, and as circumstances require, the action controlling the behaviour of the end of the weft, from the moment it is released, the invention also has another purpose, the arrangement on the upper surface of the springy branch **1** of a recess or groove **1***e*, preferably elbow-shaped, and forwardly inclined at **1***g* towards reed **6**, the recess **1***e* being in alignment with the longitudinal slit **1***f*.

The technical results which make it possible to obtain the improvements according to the invention will be more clearly understood by the explanation of a working example; reference will be made to the groups of diagrams in Figs. 3 to 8 showing the three control phases effected by the invention.

In Figs. 3 and 4 the pulling needle **4** is shown in the shed about the end of its backward run, at the moment when the elastic clamp carrying the weft-thread **7** is clamped between the branches **1** and **2**, and its guard begins to emerge from the shed, the end of the thread still occupying the position **7***a*.

In these figures, **8** are the selvedge warp threads of the upper sheet and **9** are those of the lower sheet.

In Figs. 5 and 6, the pulling needle **4**, having continued to get off the shed, the releasing blade **5** deflects the springy branch **1** from the rigid branch **2**, and nullifies the gripping action of clamp **1—2** on weft thread **7**.

At this moment, the end **7***a* of the weft thread frees itself by teasing out along or unthreading itself from the longitudinal slit **1***f* of springy branch **1** and slides on the surface thereof being guided by the recess or groove **1***e*, in which it is held by the pressure of the selvedge warp threads of the upper sheet **8**.

In fact, practically, towards the end of the backward run of the clamp and guard, said threads of the upper sheet **8** slide from the upper edge **3***e* of the guard **3** to the horizontal zone **3***a*, thus allowing said threads to come into contact with the surface of springy branch **1** of the clamp, until the said clamp has actually emerged from the shed, as can be seen clearly from the third group of diagrams of Figs. 7 and 8.

Thus, it can easily be seen that the behaviour of end **7***a* of the shoot **7** is controlled until said end has com-

pletely unthreaded itself through, being forced to follow the recess or groove 1*e*; the conclusion of said unthreading or teasing out corresponding to the moment when the shed closes.

In order to increase the margin of safety against the untimely catching up of the warp threads by the end of rigid branch 2, the said end is cut away at 2*a*; but owing to the bevel 2*b*, the releasing blade 5 has the same margin when the needle enters the shed.

It must be understood that variations and improvements of details and the employment of equivalent means are possible without departing from the nature of the invention. For example, the groove or guiding recess 1*e*, which forms a compulsory passing point for the weft thread 7 and its end 7*a*, may be replaced by other means, for example, a protuberance or a projection.

What I claim is:

1. In a weft inserting device for a continuous feed weaving loom having a pulling needle comprising a resilient clamp with its rigid branch and its springy branch, and a guard, said guard as it protects the warp threads, concurrently controls the end of the weft when it is released from the resilient clamp, its upper edge so shaped that from its point beyond the end of the resilient clamp there is a succession of distinct zones: a first horizontal zone corresponding to the least height of said guard, to prevent the warp threads being caught by the ends of the branches of the resilient clamp during the forward run of the pulling needle through the shed as well as during its backward run at the moment when the clamp and the guard begin to get off the shed thus allowing the selvedge warp threads of the upper sheet to come into contact with the upper surface of the springy branch of the clamp; a second zone, inclined to form an intermediate plane between the first zone and the upper edge of the guard at its greatest height to allow the passage or progressive sliding of the warp threads of the upper sheet, from one level to another, both either when the needle is entering or leaving the shed; and a third zone, linking the second zone to a wide part forming an upper right angled flange on the guard reaching its greatest width at a point situated directly in front of the tip of the hook of the springy branch to prevent the catching of the selvedge warp threads by said hook, while the clamp is getting off the shed.

2. In a weft threading device for a continuous feed weaving loom having a pulling needle comprising a resilient clamp the springy branch of which has a longitudinal slit delimited by a hook, said springy branch having a groove on its upper surface on alignment of said longitudinal slit and extending substantially to the end of the upper face of said springy branch for the passage of the end of the weft to control the behaviour of said end of the weft when it is released and until it has unthreaded itself through.

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