

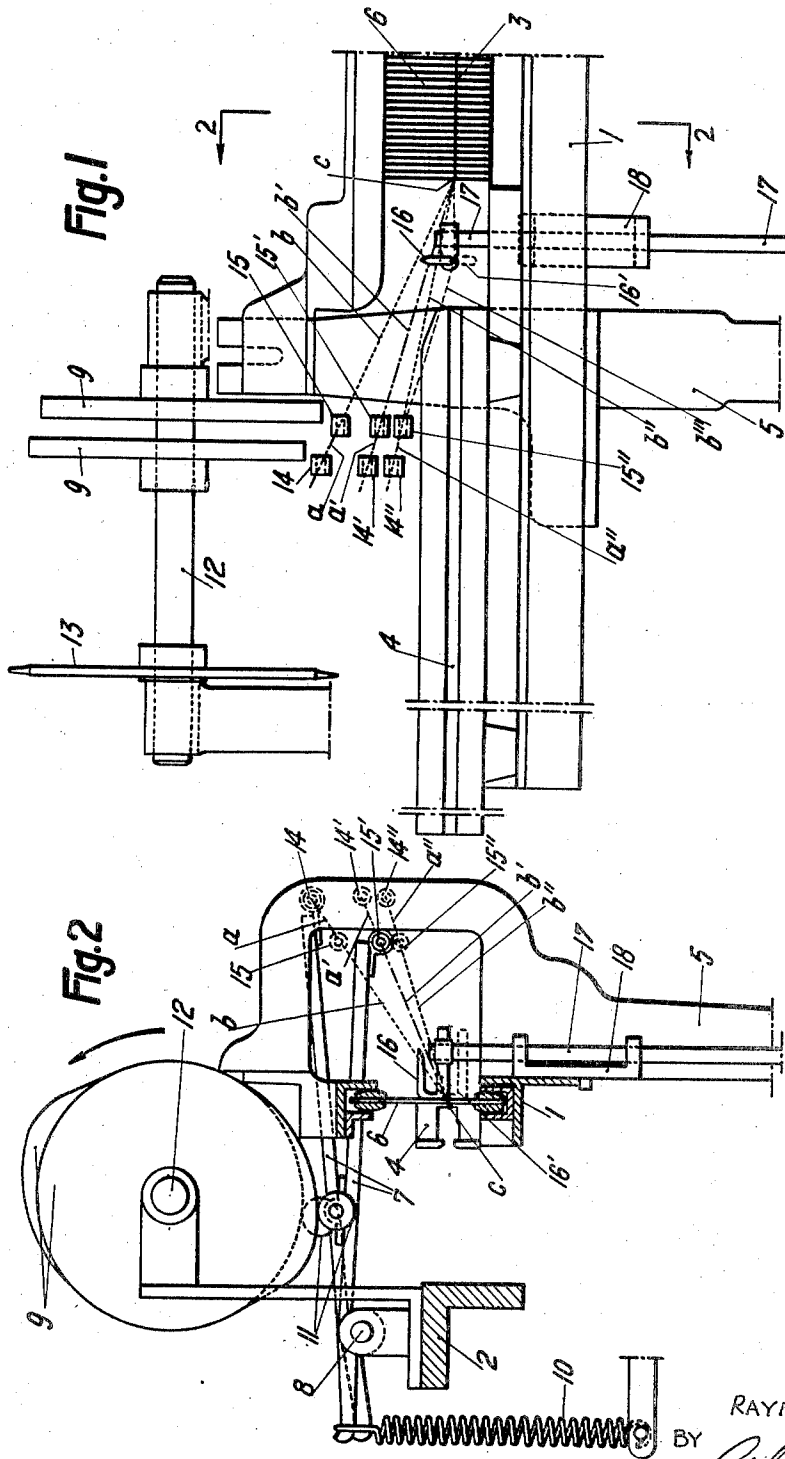
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WEFT INSERTING DEVICE FOR WEAVING LOOMS HAVING A CONTINUOUS WEFT SUPPLY

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WEFT INSERTING DEVICE FOR WEAVING
LOOMS HAVING A CONTINUOUS WEFT
SUPPLY

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The invention relates to weaving looms having weft inserting members without a cop and has for its object a device which enables wefts of different natures, colour, or kind to be inserted.

Such devices have already been proposed for these looms which have shuttles without a cop or have needles, and which are supplied by large stationary weft bobbins: for example those in which the members for presenting the various weft threads are located, for the selection, either behind, or in front, or at the end of the slay, or again above or below the path of the weft inserting member at the instant when the latter catches the weft.

Said devices cannot be used in practice in weaving looms which have a shuttle without a cop or have needles, operating according to the applicant's weaving process, and which are described in particular in his United States Patents Nos. 2,072,159—2,053,657—2,072,161—2,116,620—reference being made to the fact that according to said process, in order to enable the weft thread to be caught by the moving weft inserting member when the latter enters the shed, the weft thread which comes from the bobbin has to be stretched in front of the shed from the fell point to which it is still attached, and approximately at mid-height of the shed.

Prior art devices cannot be used in the applicant's weaving process, since the presenting members of these devices do not occupy certain specific positions, namely, they are not placed simultaneously above the plane of the cloth. Furthermore, presenting members of prior art devices are usually not formed, so that they can be carried by the slay and can hook the thread at a predetermined spot and instant when the slay occupies a predetermined position. However, even a hook member of this type could not be utilized unless it catches the thread at the place and instant required by the applicant's process. Finally, in the applicant's process, the positioning member must cooperate with presenting members of a specific type.

The device which is the object of the invention and is more particularly applicable to the applicant's looms, comprises, in principle and as regards construction, a series of presenting members for the selection of the threads (preferably eyelets) having the feature of being located above the plane of the cloth at the same time as at some distance outside the selvage and beyond the point where the weft inserting member comes into contact with the weft to be caught, and also in a plane which corresponds

approximately to that in which the slay passes when it is at about two thirds of its rearward travel, said presenting members cooperating with a fixed or movable positioning member (preferably a finger or hook), which is dependent of the slay and the function of which is, in particular, to control and perfect the correct positioning of the weft thread on the path of the weft inserting member which has to catch it, and also, in spite of the rearward movement of the slay, to compel the thread to pass between the reed and the weft inserting member when the latter is formed by a needle.

In order to enable the invention to be clearly understood, and by way of an exemplary realization, an embodiment applied to a needle loom is described hereinafter and diagrammatically illustrated in the accompanying drawing in which:

Fig. 1 is a partial view in front elevation (on the breast beam side) showing one of the ends of the slay,

Fig. 2 being a view in side elevation, in section along the line 2—2 of Fig. 1.

According to these figures, 1 is the slay, seen from the breast beam 2, in position for beating up the weft at the fell of the cloth 3, 4 being the box or channel for the inserting needle, 5 one of the swords and 6 the reed.

Elements 7 are rocking levers, the pivot 8 of which is fixed on the end of the breast beam 2, the downward and upward movements of said levers, in vertical planes, being effected by means of cams 9 and retracting springs 10, rollers 11, secured to the levers 7, being in contact with the cams 9 which are fast on a shaft 12 provided with a wheel 13, the chain of which passes over a driving sprocket fast on the end of the crank-shaft of the loom.

Said rocking levers 7 are arranged outside the sword 5 and their construction is such that the presenting members for the weft threads to be selected, which members are formed by eyelets in the example, which are mounted at the end of said levers, are located outside the selvage of the cloth 3, above the slay 1 and approximately at two thirds of the rearward travel of said slay.

Furthermore, said levers 7 preferably have slightly different lengths and oscillations, so as to prevent the entanglement of the threads.

In order to facilitate the comprehension of the invention, it has been assumed that only two levers 7 are used having eyelets 14 and 15 which alternately present two different wefts a and b,

for manufacturing a plain or calico weave fabric, each of said threads running from the fell point *c* to its supply bobbin, passing through its respective eyelet 14 or 15.

- 5 In the example shown (Fig. 2), the eyelet 14 and its lever 7 are shown in the raised inoperative position, the weft thread *a* not having to be presented to the weft inserting member, whereas the eyelet 15 and its lever 7 are shown
10 in the lowered position 15' for presenting the thread in the position *b*'.

- In the next operation, as the thread *a* has to be presented, the eyelet 14 will be lowered to 14' in order to present said thread in the position *a*',
15 whereas the other thread will have returned to the inoperative position *b*, its eyelet having been raised to 15.

- In order to ensure the correctness of the presentation of the thread in the path of the
20 weft inserting member, a finger, hook, or other equivalent member, 16, the point of which is turned in the direction of the rearward travel of the slay 1, is mounted on the rear face of said slay.

- 25 Said finger 16 may be movable, so as to enable the positioning of the thread to be more accurately and conveniently adjusted according to the kind or the dimensions of the weft inserting member used. It may, in this case, have a re-
30 ciprocating upward and downward movement, which, owing to its downward movement, will furthermore enable the levers 7 to be moved less downwards.

- In the example shown, the finger 16, which is
35 formed by a polished steel wire, is movable and its rod-shaped support 17 reciprocates in a slide-way 18 fixed on the rear face of the slay 1, the end of said rod being actuated, for example by a grooved cam fast on the shaft which serves
40 as a spindle for the swords 5, in the case in which said shaft actuates the weft inserting needles by the propelling means usually used in these looms.

- The operation of this device is as follows,
45 starting from the positions given the various members in the drawing:

- At the instant when the slay beats up the weft (Fig. 1), the lever 7 which has an eyelet 15 and which has started moving downwards, has
50 brought its eyelet from the inoperative position 15 to the position 15', thereby angularly displacing the thread to be presented, from the position *b* to the position *b*', starting from the fell point *c*, and bringing it finally to the correct position at *b*', owing to the fact that said lever 7 com-
55 pletes the downward movement of its eyelet to 15'', preferably at the instant when the slay 1 starts its rearward movement.

- Owing to the rearward movement of the slay, the point of the finger 16 passes above the thread
60 *b*' and said finger is moved downwards as shown at 16'. Owing to this fact, the thread is therefore caught and moved downwards by the finger 16 into the position *b*'''.

- 65 At this instant, the portion of thread between the fell point *c* and the finger at 16', is in the correct presenting position in front of the opening of the shed, and in the path through which the inserting needle travels when it is driven
70 towards the shed.

- When the thread is caught by the needle and drawn into the shed, the lever 7 moves upwards and brings the eyelet into the inoperative position 15, the thread which comes from said eyelet
75 remaining caught by the finger 16. As the slay

continues its rearward travel, the arm of the needle and the finger 16 are brought behind the plane of the eyelet 15, but the thread is compelled to go round said finger, thereby obliging it to continue to pass between the reed and the 5 arm of the needle.

After the change of the weft thread which is caught in the middle of the shed by the pulling needle from the inserting needle, the slay again moves forwards towards the fell and owing to this forward movement, the finger 16 loses con- 10 tact with the thread which, when the weft is beaten up, will thus be directly tensioned between the fell point *c* and the eyelet in the inoperative position 15. 15

The other lever 7 has started, slightly before the beating of the weft, to move its eyelet down- wards from the inoperative position 14 and bring it successively to 14' and finally to 14'', the thread *a* successively moving to *a*' and *a*'', then 20 being caught by the finger 16 at the beginning of the return travel of the slay, and so forth, alternately for each lever 7.

As stated, the number of levers having an eyelet may be greater; similarly, when the weave 25 requires it, the eyelets are actuated by a dobby motion of the type, for example, of those used for shuttling, said motion being advantageously constructed to impart to the eyelets an equivalent movement to that given by the cams 9. 30

The finger may be so shaped that, alone or in combination with other fingers or elements which are or are not secured to the same support 17, the equivalent of the grid of a weft stop motion is formed thereby, the fork of which is 35 located behind the slay and is supported by the usual hammer lever which is itself mounted on the frame. Of course, it is understood that without exceeding the spirit of the invention, changes, improvements and additions may be 40 made, and also the use of equivalent means may be contemplated.

Thus, for example, the levers 7 and the cams 9 could be arranged parallel with the slay, or again, while remaining arranged perpendicular 45 to the slay, as shown, said levers and cams could be located on the other side, that is to say towards the rear of the slay, or again the levers might occupy intermediate positions, but in these different cases the position of the eyelets 50 would remain the same.

As regards the finger 16, when movable, same could have other movements than a rectilinear reciprocating one, it being possible for such 55 movements to be more or less complex, combined with each other or not, in order to enable said finger to fulfil its function in the most efficient manner.

If necessary, in the case in which it is not desired to check the presence of the weft on 60 the pulling needle itself, said finger may furthermore be used as an electric weft stop motion for example by providing it with a suitably insulated blade which would be lifted by the thread.

Finally, the number of levers 7 may be dou- 65 bled so as to enable two similar threads to be made available, thereby enabling the spare thread to be presented automatically in the event of breakage or exhaustion of the other thread, without stopping the loom. 70

I claim:

1. A device for inserting different wefts in weaving looms which have weft inserting mem- 75 bers without a cop, in which the presenting members for the selection of the threads have the

feature of being located above the plane of the cloth, at the same time as at some distance outside the selvage and beyond the point where the weft inserting member comes into contact with the weft to be caught, and also in a plane which approximately corresponds to that in which the slay passes toward the end of its rearward travel, said presenting members,—preferably eyelets—co-operating with a positioning member, constituting a hooked finger which is dependent on the slay and which hooks the portion of the selected thread between the point where the weft inserting member comes into contact with the weft to be caught and the eyelet, from the beginning of the rearward travel of the

slay, after beating up the weft, and releases said thread towards the end of its forward travel, prior to the beating up of the following weft which has just been supplied by said thread.

2. An embodiment of a device as in claim 1, according to which the presenting eyelets are mounted at the end of rocking levers which are actuated by cams, the positioning member constituting a hooked finger directed towards the rear of the loom and movably mounted on the rear face of the slay in such a manner that a reciprocating movement may be imparted to it by a cam.

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