July 20, 1965 H. FEND ETAL 3,195,580

DEVICE FOR PILING-UP A WEFT-THREAD FOR LOOMS

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Fig. 1

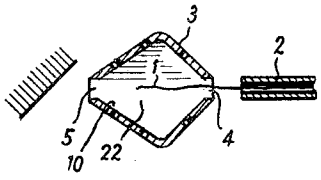


Fig. 2

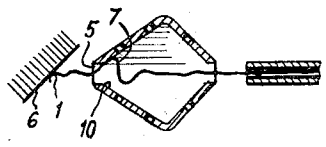


Fig. 3

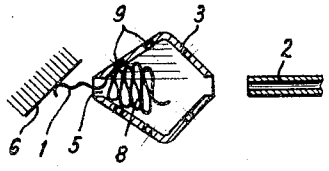


Fig. 4

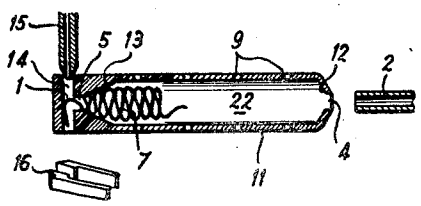
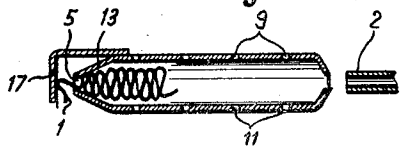


Fig. 5



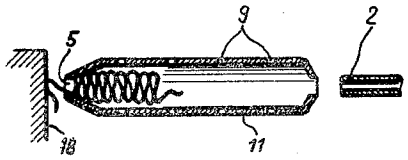


Fig. 6

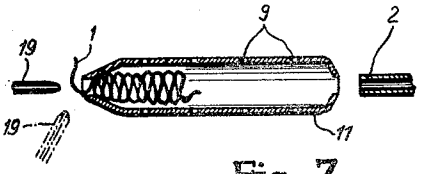


Fig. 7

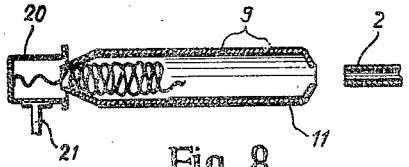


Fig. 8

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DEVICE FOR PILING-UP A WEFT-THREAD FOR LOOMS

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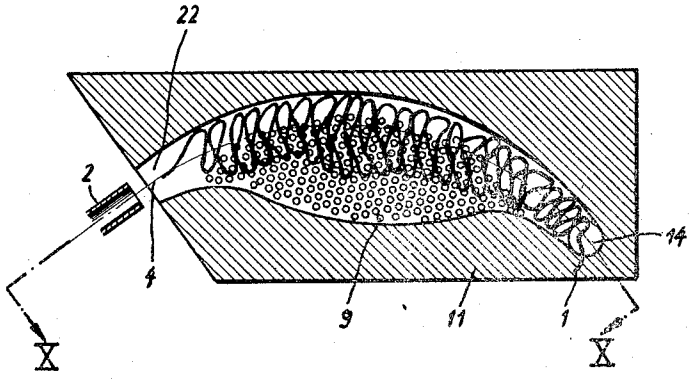
Fig. 9



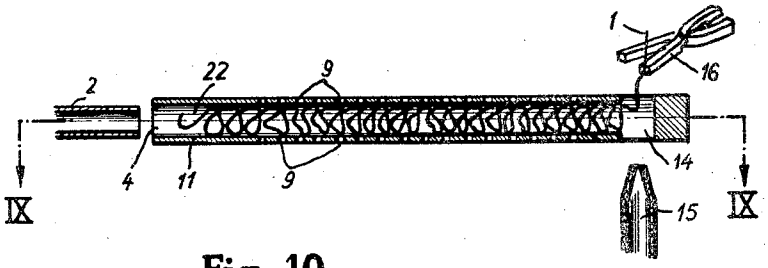


Fig. 10

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United States Patent Office 3,195,580 Patented July 20, 1965

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DEVICE FOR PILING-UP A WEFT-THREAD FOR LOOMS

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10 Claims. (Cl. 139—224)

With looms of a certain type, for example those described in the U.S. patent specification No. 2,845,093, the weft thread is carried into the warp shed at each pick at a measured length. A weft thread previously cut to its correct length is for this purpose inserted into a shuttle. Thereafter the shuttle is carried over the whole width of the weave through the shed, while the weft thread held fast at one end is taken out of the shuttle and inserted into the shed, so that it can be bound-in behind the shuttle when changing the shed.

The present invention relates to a device for piling-up such a weft thread cut to the right length for a loom, which device comprises a hollow body into which hollow body the weft thread is blown through a thread inlet opening and from which body it protrudes with one end of the thread after the same has been blown in, a second opening issuing into the cavity of this hollow body, the orifice of which lies in the region where the blown-in air flow carries along the thread.

It is known to provide as the carrier of the weft thread a hollow body into which the weft thread is blown from the rear by means of compressed air and from which the weft thread is drawn off in the weaving operation through the same opening, i.e. likewise towards the rear. This hollow cylinder has at its frontal face also a second opening in the region where the blown-in air flow carries along the thread in order to make it symmetrical and to obviate a preliminary sorting-out prior to the insertion of the weft thread.

With hollow cylinders of this type it is necessary to measure the length of the weft thread prior to blowing it in, and to cut it off at its rear end, which protrudes from the weft thread carrier. One is accordingly forced to perform the cutting-off operation at a predetermined moment. Moreover one is tied down to certain functional laws as regards the place of cutting. Furthermore care has to be taken that the previously measured lengths of the weft are completely inserted into the weft carrier for all gauges of thread, and that only the end required for seizing the weft protrudes from the weft carrier.

In order to eliminate all the difficulties and losses of time caused by the aforesaid requirements, the present invention has the new object, of providing a device of the kind referred to, with the use of a hollow body open at both ends in such a manner that the weft thread previously cut off at a length is blown in at the front end and is seized at the opposite i.e. the rear end, at the latest before its entry into the shed. The end of the weft thread is to be seized before its passing through the shed, is accordingly that one which lies at the tip of the blown-in weft thread. In order to attain this object, it is necessary to take care, that the forward end of the weft thread blown into the hollow body protrudes from the other end of the hollow body to such an extent only, that it can be seized prior to its passage through the shed, and that the subsequent whole length of the weft thread previously cut to the proper length remains lying firmly piled-up in the cavity of the hollow body. The said hollow body may form the shuttle proper, or a part to be inserted into the shuttle.

It is another object of the present invention to provide a hollow body which can be used for any gauges of weft threads, since the end blown-in last has not to be sought any more.

It is yet another object of the present invention to provide a device of the kind referred to wherein the operation of cutting the weft thread to pre-determined lengths can be performed at the functionally most favourable moment.

With these and other objects in view, which will become apparent later from this specification and the accompanying drawings, we provide a device on looms for piling-up a weft thread pre-cut to a predetermined length preparatory to its insertion into the warp shed of a loom comprising a movable hollow body having an interior piling-up space for passing through said warp shed, said hollow body having an inlet opening and an outlet opening, said interior piling-up space lying between said inlet opening and said outlet opening so that the loading end of said weft thread emerging from said interior piling-up space can pass through said outlet opening, blowing-in means for said weft thread adjacent said inlet opening for blowing said weft thread through said inlet opening into said interior piling-up space and for carrying along said weft thread towards said outlet opening and for blowing said leading end into said outlet opening, said hollow body having guiding means guiding said end of said weft thread into said outlet opening, slowing-down means arranged outside of said interior piling-up space for acting on said leading end of said weft thread emerging from said interior piling-up space.

Preferably said hollow body has additional openings positioned outside the direction of the airflow which in operation blows said weft thread into said hollow body and affording said airflow an additional escape thereby assisting the slowing-down of said leading of said weft thread by said slowing-down means.

These and other features of our said invention will be clearly understood from the following description of seven embodiments thereof given by way of example with reference to the accompanying drawings, in which:

FIGS. 1, 2 and 3 show a first embodiment, namely:
FIG. 1 the beginning of blowing-in;
FIG. 2 the beginning of the formation of a pile-up;
FIG. 3 the finally blown-in weft thread;
FIG. 4 shows a second embodiment;
FIG. 5 a third embodiment;
FIG. 6 a fourth embodiment;
FIG. 7 a fifth embodiment;
FIG. 8 a sixth embodiment;
FIG. 9 a plan view of a seventh embodiment in section on the line IX—IX of FIG. 10;
FIG. 10 an elevation of the seventh embodiment in section on the line X—X of FIG. 9.

In the following embodiments equivalent components are denoted by the same reference characters.

In the first embodiment illustrated in FIGS. 1 to 3, the end of a thread 1 is blown out of a nozzle 2 by means of compressed air through an inlet opening 4 into an interior piling-up space 22 of a hollow body 3. At the other end of the hollow body 3 there is yet an outlet opening 5 in the direction of blowing, which in relation to the interior piling-up space 22 of the hollow body 3 issues from a diverging portion 10 of the piling-up space lying between said inlet opening and said outlet opening.

FIG. 2 illustrates the operation of blowing-in at an advanced stage: the end 1 of the thread, by contining to fly in the direction of blowing, has already reached an abutment in the form of an oblique plate 6, the portion 10 serving as a guide for threading the end 1 of the thread through the opening 5, in case the end 1 of the thread should have slightly deflected from the direction of blow-

ing when being blown-in. Since the thread has been slowed down on the face 6, the rear portion 7 of the thread begins to form loops which do not pass through the opening 5.

FIG. 3 shows, still for the first embodiment, the final phase of the blowing-in. The entire length of the weft thread has emerged from the nozzle 2, and has formed in the hollow body 3 a pile-up 8, which at least partly obturates the outlet opening 5, through which the end 1 protrudes, which has been slightly deflected by the oblique face 6. In order to afford to the air blown-in a further escape from the hollow body, the latter is provided with a series of holes 9 lying outside the main direction of the air flow and acting like a sieve. These openings 9 form at the same time an additional slowing-down means assisting the abutment proper, namely the oblique face 6 in its slowing-down effect. The reason for this is that through the outlet opening 5 during the blowing-in, i.e. while the end 1 of the thread passes through this outlet opening 5, only a small proportion of the air may flow, which would flow through the outlet opening 5 when these additional openings 9 were omitted, i.e. the carrying-along effect is reduced or in other words an additional slowing down is effected.

A second embodiment is shown in FIG. 4 in the state of the finally blown-in weft thread, as are the further embodiments. The inlet opening 4, associated with the nozzle 2, of a cylindrical hollow body 11 lies likewise in a diverging portion 12 of the hollow body 11. Towards the outlet opening 5, the hollow body 11 shows likewise a convergence, namely a cone 13, on which the piled-up thread 8 bears. The thread outlet opening 5 of the piling-up space 22 issues outwardly into a transverse bore 14 lying in the wall of the hollow body 11 transversely of the axis of the blown-in air flow and constituting the slowing-down means, an auxiliary nozzle 15 for compressed air being provided as an expulsion means for the end 1 of the thread in order to drive the same out of this transverse bore 14. This auxiliary nozzle may be supplemented or replaced in a modification by a suction cup arranged at the opposite side of the transverse bore 14. Moreover, as a further modification it is also possible, to construct the expulsion means as a stem expelling the end 1 of the thread from the transverse bore 14. Such modifications have the advantage, that the end 1 emerging from the thread outlet opening 5 may be transported in a well supported manner together with the hollow body 11, and may be completely transferred outwardly at will by expulsion means arranged at a suitable point to an adjacent holding means in the form of a clamping tong 16.

The third embodiment according to FIG. 5 likewise shows a cylindrical hollow body 11 arranged downstream of a nozzle 2. At the forward end, this hollow body 11 likewise has a cone 13, which facilitates the exit of the end 1 of the thread from the outlet opening 5 when blowing-in the same. The slowing-down means consist in a stop plate 17 fixed to the hollow body downstream of the thread outlet opening 5 in a position deflecting the thread, which plate is formed by a strip section fixed to the hollow body 11 and turned up at a right angle to the direction of blowing.

In a further embodiment according to FIG. 6, merely the stop-plate 17 of FIG. 5 fixed to the hollow body has been replaced by a stop plate 18 fixed to the device outside the hollow body, which plate is likewise arranged downstream of the thread outlet opening 5 in a position deflecting the thread, perpendicular to the direction of blowing-in.

In the embodiment according to FIG. 7 the slowing-down means are constituted by an air flow directed from outside towards the thread outlet opening of the hollow body, which flow emerges from a nozzle 19. This nozzle 19 lies in the axis of the blown-in air flow, but according to a modification illustrated in chain-dotted lines in the drawing it may alternatively be directed at an angle to the axis of the blown-in air flow.

The sixth embodiment according to FIG. 8 shows a basket-shaped sieve 20 arranged downstream of the thread outlet opening of the hollow body on a holder 21 serving as a slowing-down means.

The last embodiment according to FIGS. 9 and 10 shows a flat, curved interior piling-up space 22, wherein the air flow is guided in a slight arc. The second opening lies however yet in the region where the blown-in air flow carries along the thread. The openings 9 are arranged sieve-like on the top and bottom of the flat hollow body outside the main direction of the air flow. The slowing-down means consist likewise, as shown in FIG. 4, in a bore 14 arranged transversely of the hollow body.

While we have described herein and illustrated in the accompanying drawings what may be considered typical and particularly useful embodiments of our said invention, we wish it to be understood that we do not limit ourselves to the particular details and dimensions described and illustrated; for obvious modifications will occur to a person skilled in the art.

What we claim as our invention and desire to secure by Letters Patent is:

1. A device for piling-up a weft thread pre-cut to a predetermined length preparatory to its insertion into the warp shed of a loom comprising a movable hollow body having an interior piling-up space for passing through said warp shed, said hollow body having an inlet opening and an outlet opening, said interior piling-up space lying between said inlet opening and said outlet opening so that the loading end of said weft thread emerging from said interior piling-up space can pass through said outlet opening, blowing-in means for said weft thread adjacent said inlet opening for blowing said weft thread through said inlet opening into said interior piling-up space and for carrying along said weft thread towards said outlet opening and for blowing said leading end into said outlet opening, said hollow body having guiding means guiding said end of said weft thread into said outlet opening, slowing-down means arranged outside of said interior piling-up space for acting on said leading end of said weft thread emerging from said interior piling-up space.

2. A device for piling-up a weft thread pre-cut to a predetermined length preparatory to its insertion into the warp shed of a loom comprising a movable hollow body for passing through the warp shed having an inlet opening for said pre-cut weft thread, pneumatic means for blowing said pre-cut weft thread into said inlet opening and carrying said weft thread through the interior of said hollow body, said hollow body having an outlet opening from which an end of said weft thread can emerge and towards which said pre-cut weft thread with said end is carried along in the interior of said hollow body, guiding means on said hollow body guiding the thread through said outlet opening, and slowing-down means located outside of said hollow body for acting on said end of the weft thread emerging from said outlet opening.

3. A device as claimed in claim 1 wherein a part of said hollow body converges in the direction towards said outlet opening to form said guiding means.

4. A device as claimed in claim 1, wherein said slowing-down means for the leading end of said weft thread comprises a stop-plate fixed to said hollow body downstream of said outlet opening thereof in a position to deflect the end of the weft thread emerging from said outlet opening.

5. A device as claimed in claim 1, wherein said slowing-down means for said leading end of the weft thread comprises a bore arranged in the wall of said hollow body transversely of the direction of blowing-in said weft thread, and expulsion means for expelling said end of the weft thread from said bore.

6. A device as claimed in claim 1, wherein said slowing-down means for said leading end of the weft thread

comprises a bore arranged in the wall of said hollow body transversely of the direction of blowing-in said weft thread, and a nozzle directed into said bore for expelling said leading end of the weft thread from said bore.

7. A device as claimed in claim 1, wherein said slowing-down means for said leading end of the weft thread comprises a nozzle for blowing an air flow from outside towards said outlet opening of said hollow body.

8. A device as claimed in claim 1, wherein said slowing-down means for said leading end of the weft thread comprises a cup-shaped sieve arranged downstream of said outlet opening of said hollow body.

9. A device as claimed in claim 1, wherein said hollow body has additional openings positioned outside the direction of the air flow which blows said weft thread into said hollow body for affording said airflow an additional escape thereby assisting the slowing-down of said leading end of said weft thread by said slowing-down means.

10. A device as claimed in claim 1, wherein said slowing-down means for said leading end of the weft thread

comprises a stop plate fixed to said device outside said hollow body downstream of said outlet opening for deflecting said leading end of the weft thread emerging from said outlet opening.

References Cited by the Examiner

UNITED STATES PATENTS

1,787,491	1/31	Primavesi	139—12 X
2,770,261	11/56	Turner	139—126
2,902,058	9/59	Walton	139—126
3,124,164	3/64	Ewing	139—12

FOREIGN PATENTS

1,227,995	3/60	France.
1,237,034	6/60	France.
860,167	2/61	Great Britain.
174,387	2/61	Sweden.

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