

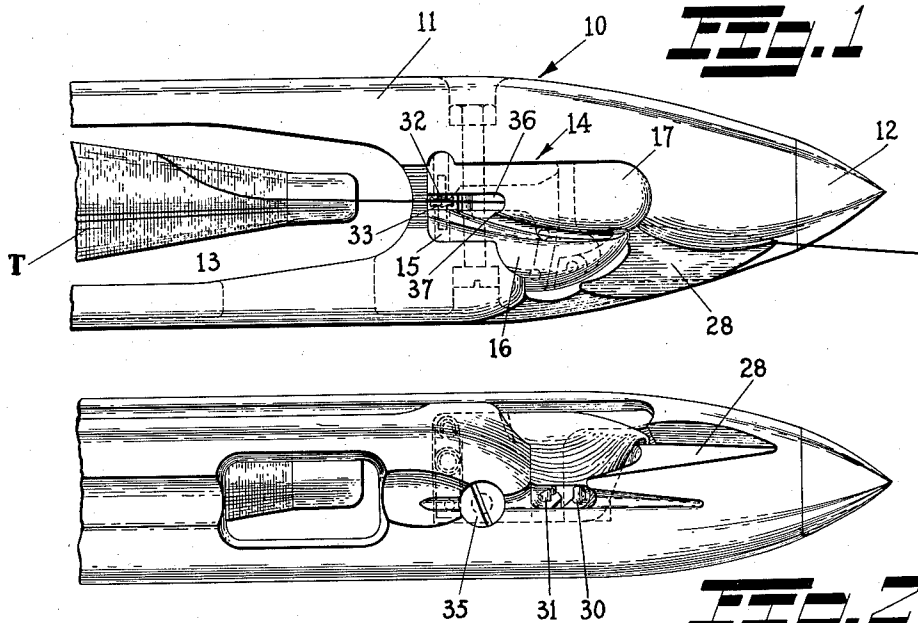
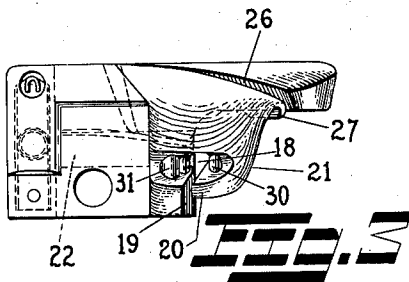
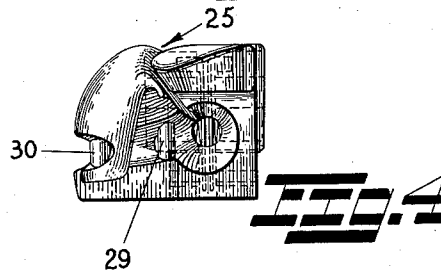
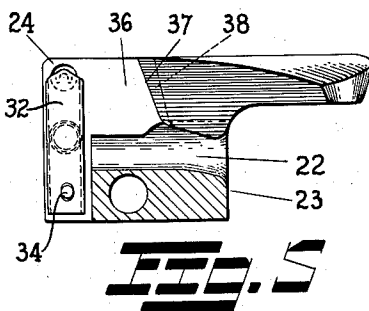
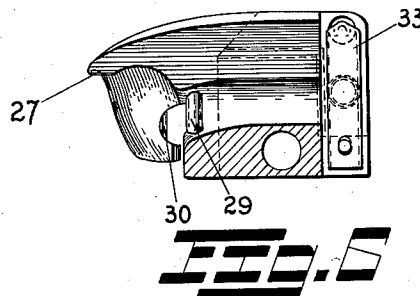
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SHUTTLE AND THREADING BLOCK

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SHUTTLE AND THREADING BLOCK

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This invention relates to a novel threading block for loom shuttles and to the combination of that block with a shuttle.

It is a general object of the invention to devise a shuttle and threading block which shall serve more effectively to thread the filling quickly and surely at transfer of filling in the loom and which shall be particularly resistant to unthreading.

A further object is that of devising a threading block and shuttle combination in which the parts shall be simple in design, easily manufactured, and most rugged and durable in use.

Another and more specific object is that of improving the threading block of United States Patent No. 2,835,278 and rendering it more resistant against unthreading.

Other objects are those mentioned in the patent above and those which will appear from the following more detailed disclosure.

In automatic bobbin changing looms the shuttle threading block plays a very important part since it must be capable of threading almost instantly as the filling is replenished, threading partially on the first pick and then completely at the second. Failure to thread, broken filling, unthreading and other undesired results cut efficiency and cannot be tolerated, or at least must be kept at an absolute minimum.

For weaving fine goods, it is desired that at transfer of filling to the shuttle, it shall thread as intended, but also, it should thread very quickly so that the initial pick may not be distinguishable from those following.

The shuttle and shuttle block combination of said patent are very effective in accomplishing the rapid threading and tension on the filling is well controlled. There is one feature, however, which is not fully satisfactory and that follows more or less what may be expected with blocks of the type which thread most readily. It is pretty much axiomatic in weaving that a block which threads with greatest facility will also unthread easily, at least under some conditions. With the block of the patent some undesired unthreading has been experienced when a loop of filling is thrown toward the shuttle end as it often is at checking of the shuttle at the right hand side of the loom. Of course, the loom may rethread and not stop, but tension is momentarily affected and thus unthreading is not to be tolerated if it can be helped.

According to the invention the inner end of the block is formed with a means to trap or inhibit the filling, or a loop thereof, from escaping from the channel and threading slot even though it may start to unthread.

The invention will be described in detail by reference to specific embodiments thereof one of which is illustrated in the accompanying figures of drawing, wherein:

FIG. 1 is a plan view of a shuttle to which the invention is applied.

FIG. 2 is a front elevation of the shuttle of FIG. 1.

FIG. 3 is a front elevation of the shuttle threading block.

FIG. 4 is an end view of the block.

FIG. 5 is a section of the block cut along a center line of the thread channel.

FIG. 6 is a section of the opposite half of the block.

Now referring to FIGS. 1 and 2, a shuttle 10 of wood or other material has the usual body 11, tip 12, bobbin

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chamber 13 in which a bobbin and thread package T are held in a manner well known to those skilled in the art. A threading block 14 is retained in a recess in continuation of the bobbin chamber.

As seen in FIG. 1, the thread drawn from supply T extends angularly to a point at the end of the loom as the transfer is effected and as the shuttle with its new supply is picked across the loom. The block is particularly well adapted to thread very quickly as will be explained.

Block 14 is comprised of a body portion 15 from which there extends laterally to the front side an apron 16, and toward the end or toward the shuttle tip, a shield 17. The apron is rounded as shown and at its lower end, has a side eye 18 to which a vertical entrance slot 19 leads. The apron and side eye are set into the material of the shuttle itself with the lowest part 20 of the eye below the material of the shuttle in front of it so that on the second pick of the loom after transfer the filling may pass down edge 21, beneath point 20 and up into the side eye through slot 19. Once completely threaded it is very difficult for the filling to become unthreaded by escaping from the side eye trap.

Body 15 is drilled or otherwise formed with a longitudinal thread channel 22, this extends all the way through the body and is rounded at the end 23, preferably being flared to permit the thread to be fed from the channel and to turn laterally and through the side eye with a minimum of friction and without danger of being cut or abraded.

The block illustrated is for use mainly with synthetic filling materials and is provided with tension pads, however, if used for cotton, no tension means is needed and then the channel of the block may be flared at the entrance end. In the case where tension pads are used the identity of the channel is more or less lost as it runs into the pad slot 24, FIGS. 3-6.

The threading of the filling is initially facilitated by a threading slot differently positioned and disposed at an unusual angle in relation to the other parts. The blank or casting from which the block is made is formed with a shallow recess or crevice 25 inclined as in FIGS. 1 and 4. This crevice is well to the front of the vertical center plane of the shuttle and is aligned very closely with the filling as it extends just before threading. A threading slot is then cut by a suitable cutter starting with this recess and inclining the path of the cutter from front to rear of the shuttle. The slot 26 then extends from front to rear in the longitudinal direction and also inclines from a point forwardly of the shield 17 to about the center plane of the body and of the shuttle as well, as observed at the end adjacent the bobbin chamber. This slot is referred to as making a compound angle and is most effective in rapid delivery of the filling to the channel. It also intersects the latter at an angle so that once the filling enters and runs lengthwise of the channel, it is effectively restrained against unthreading due to lateral or centrifugal forces acting in and on the thread.

The travel of the shuttle just after transfer and as it is picked takes advantage of this angularly disposed threading slot so that the filling enters and in fact, snaps into the channel almost immediately.

The blank is so cast that the cutting of the notch 26 leaves a lip 27 somewhat hooked in form at the apron side of the block. This cooperates with a threading notch 28 cut in the shuttle material. This notch is much smaller than usual and occupies only about one-third of the shuttle width. It is thus far to the front of the shuttle and as can be seen in FIG. 1, the lip 27 lies under the shield 17 and forms a trap in conjunction with notch 28. Once the filling has entered below the lip it will be trapped since so long as it is taut, it cannot escape. As soon as

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the shuttle is picked back, the filling is threaded into the side eye. The thread might, of course, run through the smooth surfaces of the cast iron or other block since it is sand blasted and finished to present only a polished surface. However, life is increased if hardened steel pins are used and thus three pins 29, 30 and 31 are set into the block so that the wear incidental to the running thread is taken by them.

The notch 24 is suitably drilled to accommodate tension pads 32 and 33 backed by the usual springs and guided at the bottom by a pin 34. These may be of any suitable type and preferably are grooved as in United States Patent 2,046,287. Returning to FIG. 1, it is to be noted that in all forms the shield is of considerably greater width than similar members heretofore utilized, in fact, it is of substantially the same width as the body 15. The shape of the block, however, requires that only a minimum of the shuttle material be cut away for the recess. The block may be held in place by the usual cross bolt 35.

This block is substantially flat on top except for the crevice 26 and the general rounded contour of the apron along with the fact that the material of the shuttle has been cut away to a lesser extent than usual gives a smooth exterior on which the filling may not catch. Also there is less likelihood that the shuttle material will become cracked or splintered.

The form of the invention above described has marked advantages and also may be applied to the usual shuttle without modification thereof except that it becomes necessary to cut out or away less of the shuttle material than formerly.

The thread channel must naturally align fairly closely with the axis of the bobbin from which the filling is drawn. Heretofore the side eye itself, if in the block, has been located far enough inwardly from the front face of the shuttle so that pins and plates have been utilized to take the wear and cutting action of the thread. These are set in the shuttle material in a manner well known and require added work, complication and also a further cutting away of the material in order to be accommodated. By further accentuating certain of the novel aspects of the block as above described, it is practical for the first time to bring the side eye of the block into a position of maximum efficacy for feeding, along with retaining all essential feeding and threading characteristics and advantages of the block above described with greater strength of shuttle at the block end.

Thus far described the block is substantially identical with that of the patent above noted. While resistant to unthreading caused by several conditions, that block is, however, open to becoming unthreaded when a loop of filling is thrown toward the end of the shuttle. Such a condition occurs frequently with certain types of filling material although with others it may be of practically no consequence. When the shuttle is arrested in its movement toward the replenishing side of the loom, inertia frequency tends to keep the filling flowing from the end of the bobbin and since it is not taken or cannot as easily pass through the side eye, etc., it tends to form a loop of loose thread which in certain instances may align so well with the threading slot that it, or the thread behind the loop, passes out through the threading slot. This thus results in an unthreading which may be only partial, but nevertheless, requires a rethreading. The extent of unthreading may be such as to affect tension and fabric appearance even though the thread does rethread itself. Again it may result in stopping the loom. Obviously, these are conditions all of which are undesired but which are corrected by the improvements herein to be described.

As seen in the various figures of drawing, the threading slot has been modified by cutting a filling restraining notch 36 inwardly of the block from the tension pads, or from that end of the block which may not have pads in some cases. This notch is preferably of the same width

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as the pad slot and is directed more or less vertically of the block. It is cut so that it leaves material defining a hook having a point 37 which is positioned to block off exit of the thread from the threading slot beneath and adjacent it. As shown in FIG. 5, this notch is formed so its innermost, curved bounding surface 38 is inclined as shown. Of course, the notching cut removes material which heretofore has defined the threading slot so the latter is shorter and also does not necessarily cross the center line of the channel 22. In other words, the notch constitutes a sort of barrier opening in the direction of the end of the block at which filling enters and blocks off ballooning filling from unthreading toward the end of the shuttle.

In use the block functions at threading in the manner described in the patent above noted and will not unthread due to a loop of filling being thrown toward the end of the shuttle. As that takes place, the loop may pass above the block and draw the filling from the pads, but will be trapped in the hooked end of the filling restraining notch. It may not pass further so remains threaded except for being drawn out of the pads whereas such action has heretofore frequently resulted in a complete escape of filling from the threading slot 26 thus affecting the tension even if the shuttle should automatically rethread. However, it was much more likely that the filling would break causing the loom to stop.

The restraining or trapping notch may be formed in any convenient way but preferably is cut by an end mill type cutter which is positioned at the appropriate angle. It may also cut at the same width as the cutter which forms the pad slot although the two are cut separately. Sand blasting or tumbling may be utilized to smooth all surfaces after which the block may be finished with any suitable lacquer or other coating.

While one embodiment of the invention has been disclosed, it is to be understood that the inventive concept may be carried out in a number of ways. This invention is, therefore, not to be limited to the precise details described, but is intended to embrace all variations and modifications thereof falling within the spirit of the invention and the scope of the claims.

We claim:

1. The combination of a shuttle and threading block said shuttle having a bobbin chamber and adjacent one end a recess in continuation of said chamber in which said threading block is held, said block comprising a body portion, a shield extending toward the end of the shuttle and an apron inclined toward the front of the shuttle and terminating at its lower end in a side eye opening having an upwardly directed, entrance slot, a thread channel in said body portion aligned substantially along the center line of the shuttle, a threading notch in the shuttle positioned wholly at the front of a plane taken on the vertical center line of the shuttle and a threading slot in the block substantially aligned with said notch and extending for a substantial part of the length of the thread channel and apron defined as a parallel sided cut directed at a compound angle so that it inclines from the front of the shuttle rearwardly and also from the end of the shuttle adjacent said threading block toward the bobbin chamber to intersect the thread channel, said apron being formed to function in conjunction with said notch to restrain filling once threaded and means including a part of said body portion defining a filling restraining notch communicating with said channel and threading slot and opening in the direction of the filling entrance end of the block for inhibiting the unthreading of the filling.

2. Mechanism as defined in claim 1 wherein said means defining a filling restraining notch includes an inwardly directed hook-like point above and adjacent said threading slot.

3. A mechanism as defined in claim 1 wherein tension

pads are provided and positioned at the entrance of said channel, threading slot and loop restraining notch.

4. A threading block for shuttles which comprises a body portion, a shield, an apron inclined toward the front of the block and having at its lower end a side eye opening having an upwardly directed, entrance slot, a thread channel in said body portion extending substantially along the length of the block when applied in a shuttle, a threading slot in the block extends for a substantial part of the thread channel and apron defined as a parallel sided cut directed at a compound angle so that it inclines from the front of the block at its upper face to the channel and inclined longitudinally from the shield end at the front toward the center of the block at the end opposite the shield, and laterally from front to back of the block, means forming a part of said apron for restraining filling once threaded and means including a part of said body portion defining a filling restraining notch communicating with said channel and threading

slot and opening in the direction of the filling entrance end of the block for inhibiting the unthreading of the filling.

5. Mechanism as defined in claim 4 wherein said means defining a filling restraining notch includes an inwardly directed hook-like means above and adjacent said threading slot.

6. Mechanism as defined in claim 4 wherein said means defining a filling restraining notch terminates in a hooked portion above and adjacent said threading slot and serving as a barrier against unthreading of the filling.

References Cited in the file of this patent

UNITED STATES PATENTS

1,091,432	Hollins	Mar. 24, 1914
2,314,669	Talbot	Mar. 23, 1943
2,581,494	Messier	Jan. 8, 1952
2,835,278	Villani	May 20, 1958