

Oct. 16, 1951

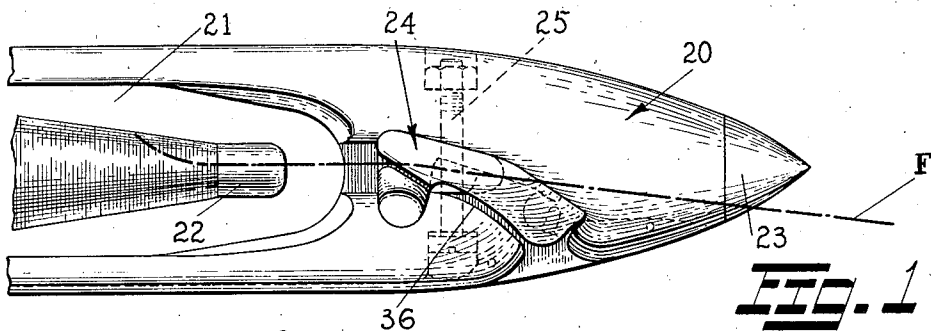
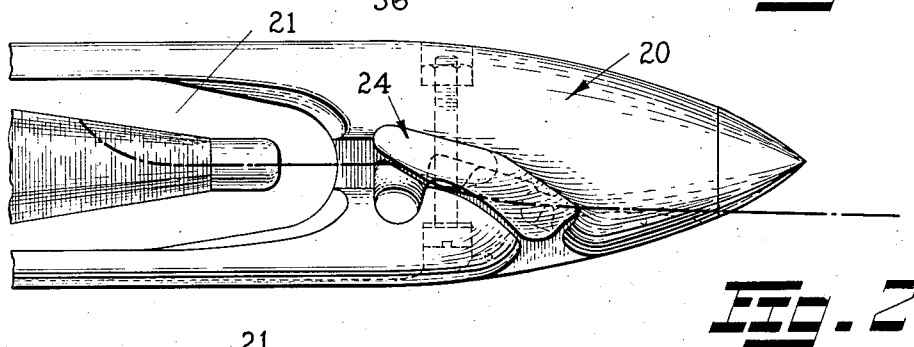
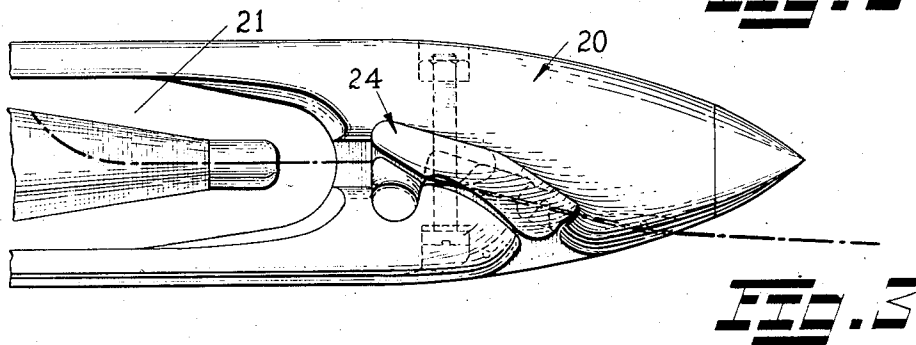
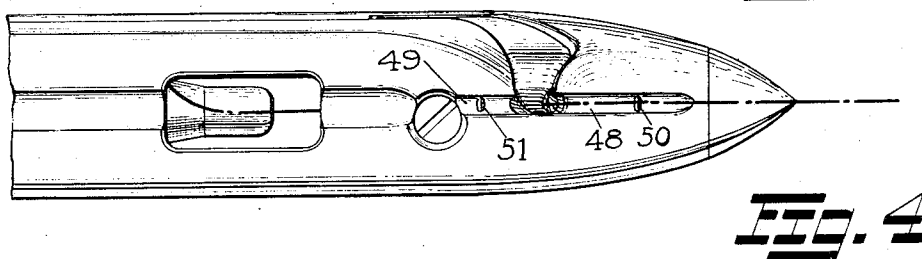
A. VILLANI

2,571,396

SHUTTLE THREADING BLOCK

Filed Jan. 19, 1950

2 Sheets-Sheet 1



INVENTOR.
ANTONIO VILLANI

BY

Rodney C. Smith

ATTORNEY

Oct. 16, 1951

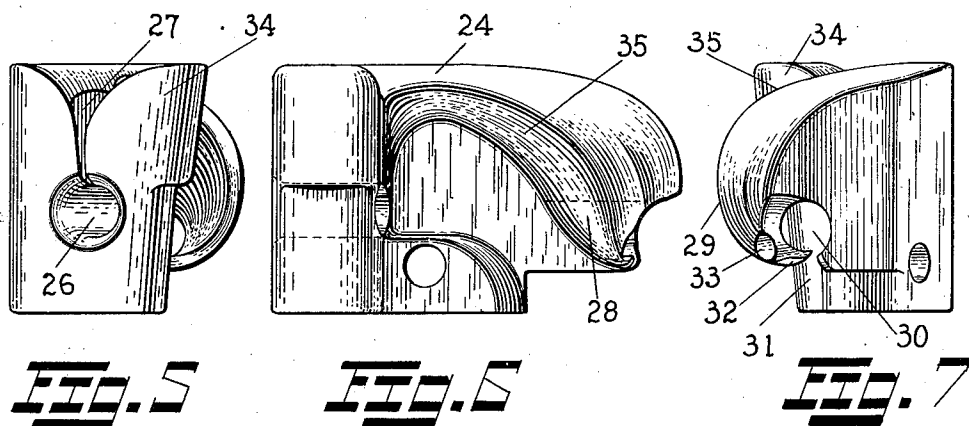
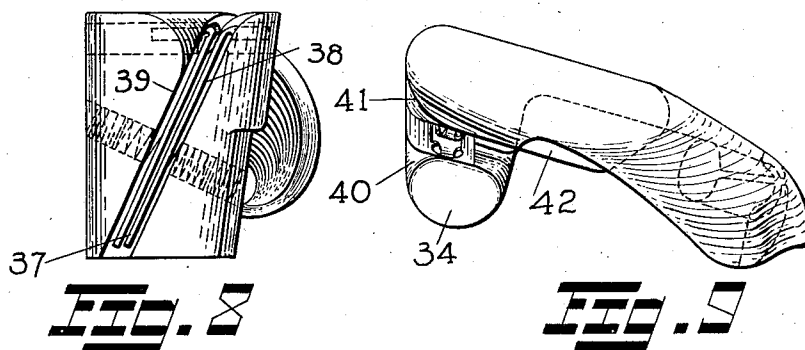
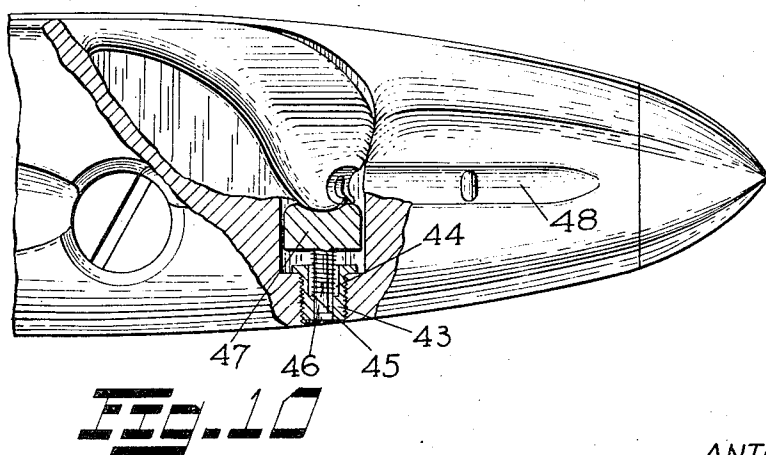
A. VILLANI

2,571,396

SHUTTLE THREADING BLOCK

Filed Jan. 19, 1950

2 Sheets-Sheet 2



INVENTOR.
ANTONIO VILLANI

BY
Rodney C. Southworth
ATTORNEY

UNITED STATES PATENT OFFICE

2,571,396

SHUTTLE THREADING BLOCK

Antonio Villani, Milford, Mass., assignor to
Draper Corporation, Hopedale, Mass., a corporation of Maine

Application January 19, 1950, Serial No. 139,479

14 Claims. (Cl. 139—223)

1

This invention pertains to a threading block for shuttles for automatic looms, and more particularly to threading blocks adapted to thread completely on the first pick after replenishment of the filling supply.

It is a general object of the invention to devise a threading block for a shuttle for use in automatic looms which shall provide for threading the shuttle completely upon the first pick after transfer of a supply of filling to the shuttle upon actuation of the replenishing mechanism.

It is a further object of the invention to devise a very simple threading block which shall be adapted to function with all types of yarns and which shall function to thread completely at the first pick under all normal conditions of operation of the loom and with virtually no tendency to unthread once the filling has become completely threaded in the side eye.

It is a further object of the invention to devise a threading block of the type described which may be cheaply formed from cast iron or other metal adapted to be molded and which shall require a minimum of machining and no additional parts other than the more or less conventional tension pads employed with certain types of artificial filaments.

Other objects will be evident from the following more detailed disclosure.

In that loom operation which is most prevalent at the present time, a bobbin or carrier for a filling supply is always maintained in a position to be automatically inserted in the shuttle as it is boxed at the replenishing side, and the filling on that carrier is extended to and is held at a point outwardly of the supply. As each new supply is inserted the carrier from which filling has just been depleted is expelled from the shuttle by the new incoming supply and by mechanism well known to those skilled in this art. As that transfer is completed the shuttle is shortly thereafter picked toward the opposite side of the loom and the thread starts to be drawn from the filling supply therein or which was just transferred thereto, and threads to a certain extent or partially only, on the first pick away from the replenishing side. Then on the second or return pick, the thread advances still further into the threading block or other portion of the shuttle by which it is controlled and through which it is delivered as it is deposited in the warp shed thereby to become completely threaded. Obviously, certain difficulties are experienced when two picks are required to effect complete threading of the filling and it is very

2

difficult to lay the first pick at the transfer under the same conditions as the subsequent picks since it is almost invariably true that the tension imposed upon the partially threaded yarn is not the same as that prevailing when the yarn has become completely threaded. Again, there is some tendency for the yarn to become unthreaded before the second pick or before it has a chance to be completely threaded in which event it is frequently broken or for some other reason causes stopping of the loom or the production of imperfect fabric.

It has for these and other reasons been desired to devise a threading block which will thread completely at the first pick after transfer or after replenishment of the filling supply of the shuttle and preferably, which will thread completely at a point very close to the start of that first pick.

In carrying the invention into practice a threading block has been devised for mounting in a wooden or other shuttle in a somewhat conventional position and by the generally accepted retaining means. The threading block may be of cast iron, bronze or brass and is adapted to rest in a cavity formed in the shuttle adjacent a part cut away at the side thereof to form a side eye passage in the shuttle material from which the filling may extend and by which it is guided in grooves or slots in the wood or other material from which the shuttle is made. The shuttle block has a thread passage at its inner end, that end adjacent the filling supply, and a thread trap at the outer, front end of that portion of the block which is positioned adjacent the side eye opening cut in the shuttle material. This thread passage is preferably of relatively short extent being formed in a widened or heavier portion of the shuttle block and has a converging thread entrance slot extending from the top portion of the block down into the passage. Preferably this entrance slot may be inclined slightly as will hereinafter be explained, although that is not absolutely necessary.

Between the thread passage and the trap, the threading block is of relatively narrow transverse section and the material thereof is disposed entirely to one side of the path which the running thread eventually takes as it is threaded and as it passes through the block after being completely threaded. The material of the shuttle body itself is preferably formed so as to be spaced from this thread guiding surface and to extend in substantial parallelism therewith. The slot or vertically disposed opening formed between the

3

guiding surface of the block aforementioned and the cooperating parallel, spaced surface of the shuttle extends in continuation of the thread passage and its thread entrance slot, or in substantial continuation thereof.

The thread trap at the forward outer end of the block is formed within and by a forwardly projecting, rounded part of the block and, as will hereinafter be described in greater detail, has a thread side eye formed by drilling or in any other convenient manner, this side eye also being disposed in substantial continuation of the thread passage and thread guiding space between the block and shuttle material just above described. The side eye is entered by an entrance slot upwardly disposed for entering the slot from beneath. The thread having been entered in the converging entrance first moves down to the thread passage and is then guided around the outer bulging, forwardly extending, rounded portion of the trap to be positioned below the side eye so that it may pass up through the side eye entrance into the eye itself whereupon it becomes fully threaded. The outer or forward portion of the eye is rounded in such manner as to present a smooth uninterrupted surface over which the thread may be drawn so that the tension imposed thereon will not vary substantially no matter which direction the shuttle is moving. The position of the lowermost portion of the trap or, at least the part thereof in which the side eye entrance is formed, is below the adjacent edge of the shuttle block material within which the threading block is disposed so that once a thread has snapped beneath the trap and upwardly into the eye, it will be maintained at such elevation that there will be no likelihood of it falling downwardly through the side eye entrance thereby to become unthreaded.

Now having described the general characteristics, objects and advantages of the invention, certain forms thereof will be described in greater detail by reference to the accompanying figures of drawing in which:

Fig. 1 is a plan view of part of a shuttle to which a threading block in accordance with the invention has been applied.

Fig. 2 is a view similar to Fig. 1, but showing the thread which was completely unthreaded in Fig. 1, partially threaded or having been entered in the thread passage preparatory to being caught later within the trap.

Fig. 3 is a similar view showing a later point in the cycle in which the thread has become completely threaded.

Fig. 4 is a view similar to Fig. 3, but taken in front elevation.

Fig. 5 is a detail view showing one form of the invention as applied to weaving cotton, the threading block here being illustrated as seen from the inner end of the shuttle as the same is disposed at the side of the loom at which replenishment takes place.

Fig. 6 is a front elevation of the same block.

Fig. 7 is an end view of the block as seen from the outer end of the shuttle.

Fig. 8 is a view corresponding to Fig. 5, but showing a modification of the block as applied to weaving rayon, etc.

Fig. 9 is a top view of the threading block illustrated in Fig. 8.

Fig. 10 is a view, partly in section, showing a modification wherein a spring pressed cap is employed for the purpose of preventing escape of

4

the filling once it has become completely threaded.

Now referring to the figures, a shuttle generally indicated by numeral 20 has a central recess 21 within which is carried in the conventional manner a supply of filling on a bobbin or other carrier 22, that supply of filling being drawn off over the end of the carrier and being extended outwardly as a F to be held at a point somewhat removed from the tip 23 of the shuttle prior to and at the point of transfer or replenishment of the filling supply as the shuttle is disposed at the shuttle box at that particular side of the loom. A threading block generally indicated by numeral 24 and hereinafter to be described in greater detail is held within a cavity cut or otherwise formed in the shuttle body at that end of the shuttle, the block being fitted somewhat tightly in the said cavity at certain points about its periphery and being positively retained therein by a bolt 25 which passes transversely through the shuttle material and also through a registering hole in the threading block itself.

Reference is hereby made to U. S. Patent 2,272,147 to Brown in which a threading block adapted to thread completely at the first pick has been thoroughly described and claimed and in which the position of the shuttle, replenishing mechanism and other parts incidentally operable at replenishment have been completely illustrated. Attention is directed toward this particular patent for a more complete showing of the parts cooperating at transfer and similar illustration and description have therefore been omitted from this disclosure.

Now referring to Figs. 5, 6 and 7, the threading block 24 has at its inner end, that is, the end adjacent the supply of filling carried by the shuttle, a thread passage 26 which is here shown of circular cross section, but which may be of any convenient shape and which may be formed by being cast in the block, or which may be machined in any convenient manner. A thread entrance slot 27 extends downwardly from the top of the block and preferably has converging sides thereby to facilitate and assure entrance of the filling as the same is drawn taut preparatory to the movement of the shuttle across the loom and through the shed. The part of the block through which the entrance slot and thread passage are formed comprises only a relatively small portion of the complete length of the threading block as illustrated in Figs. 6 and 9, and the disposition of the slot and passage is one angularly disposed to the general longitudinal center line of the shuttle and extending outwardly and forwardly toward a thread trap 28 at the outer end of the block. This thread trap 28 is formed by a forwardly extending portion of the block which has an outwardly curved, bulging or rounded surface 29, and within which is formed by casting or by some convenient machine operation, a side eye 30 located somewhat below the general level of the thread passage. This side eye is also inclined in the same general direction as the thread passage (from the back towards the front and outwardly,) and has a side eye entrance 31 which is disposed in a vertical direction and which enters the side eye from beneath. The side eye of more or less circular cross section is defined at its outer and lower side by a hooked member 32 the outer part of which is a continuation of the rounded surface 29. This hooked portion is also grooved or notched at 33 and is rounded conveniently so as

5

to provide a suitable bearing over which the filling may run as it feeds outwardly through the side eye to be laid in the warp shed during the shuttle flight.

Between the thread passage 26 and the side eye 30 or the thread trap 28, the running filling is not confined within the threading block, but is guided by the material of the block at one side only. The surface of the block disposed between that portion 34 thereof within which the thread passage is formed and the forwardly curved part within which the side eye is to be found is indicated by numeral 35 and curves forwardly and outwardly extending more or less in the general direction which the filling takes as it runs from the thread passage through the side eye. This angularly disposed thread guiding surface also serves in conjunction with the cooperating surface 36 formed in the wood or other material from which the shuttle body is formed to provide a slot within which and by which the filling is guided during the threading function. These surfaces 35 and 36 are more or less parallel, but are spaced as illustrated so as to provide a reasonable space through which the filling may move after it has entered the thread passage 26 and as it is drawn taut as in Fig. 2 thereby to progress from the position shown in Fig. 1 to that of Fig. 2 and thereafter to the completely threaded state illustrated in Fig. 3. The movement of the lay at these particular times is important since the angular relationship of the thread is varied to assist it to thread.

The level of the lower part of the thread passage 26 is also disposed at a distance above the underneath part or lowest surface of the trap at which the entrance slot 31 starts so that the thread will not be restrained from entering the trap, yet will be held high enough during loom operation so that it has little tendency to become unthreaded by dropping down through the entrance slot 31. In the shuttle block illustrated in Figs. 5-7 the difference in elevation is perhaps at a maximum, but in some instances may be slightly less thereby to facilitate entry of the thread quickly. Some difference is desired because then the thread lingers slightly or resists complete threading until it has been drawn sufficiently taut as it has been cammed around the curved outer surface 29 of the trap whereupon it snaps into the side eye 30 just about as the shuttle enters the shed.

Both the thread passage entrance slot 27 and the side eye entrance slot 31 are preferably although not necessarily disposed at a slight angle to the direction of the running filling once the shuttle has become completely threaded so that, although the angular disposal of the slots makes no noticeable difference to threading, it does serve very effectively to prevent release of the thread or unthreading. Since the entrance slots converge in the direction of threading, the angular relationship of the slots does not prevent entry of the thread. After the thread has once entered the passage 26 or the side eye 30 the interior surfaces of which are nearly cylindrical, there is no chance for escape so long as the thread is maintained in taut condition.

Now referring to Figs. 8 and 9, a modification of the threading block will be described, this modification being adapted to serve when weaving rayon or other similar materials. Here the general nature and disposal of the various parts and elements entering into the complete block are very much the same as that of Figs. 5-7 and,

6

in addition, certain tension pads are added, these being especially desirable for the materials mentioned. The innermost part of the block is slotted vertically and somewhat angularly as shown in Fig. 8 rather than being apertured, to present a thread passage into which leads the converging thread entrance slot both of which serve very well when weaving cotton. This vertical slot indicated by numeral 37 is of sufficient width to accommodate front and rear tension pads 38 and 39 which may be of any convenient type, but preferably are formed as shown and described in U. S. Patent 2,046,287. The slot preferably inclines from front to rear and, of course, the pads are disposed at a similar inclination. The entrance to the slot is bevelled as at 40 and 41 so that the thread must be guided to a position to enter between the tension pads and thereafter will be led downwardly toward the lowermost portion of the thread passage which is actually defined by a more or less horizontally disposed ledge 42, Fig. 9. This ledge 42 which defines the lowermost part of the thread passage is, as previously described relative to the first form of the invention, positioned horizontally above the lower portion of the trap, but not very far above that particular part of the block, for example, a distance of $\frac{1}{2}$ to $\frac{1}{8}$ of an inch has been found to serve very well.

Now referring to Fig. 10, a second modification which may be employed with either form of the threading block is illustrated and comprises a spring pressed member cooperating with the trap to prevent withdrawal or escape of the filling once the same has entered the side eye. The shuttle body itself is apertured or drilled out at a position just beneath the lower part of the trap or the hooked portion 32 thereof when the block has been assembled in position in the shuttle and the restraining member is positioned in that aperture. The restraining means comprises a bushing 43 which is threaded externally to engage readily within the aperture above mentioned and has a head or flange portion 44, this flange being slotted at the top. The flange limits downward movement as it bears on a shoulder midway of the receiving aperture or well in the shuttle body. The flange and also the lower end of the sleeve are slotted to receive a screw-driver. This bushing 43 is interiorly apertured to receive a spring 45 within which is received a stem or plunger 46 of a cap 47 which is concavely formed to seat upwardly against the lower curved surface beneath the side eye 30. The spring 46 may be adjusted as to its tension by turning the bushing 43 in the body of the shuttle either by applying a screw-driver upwardly from beneath or by turning it from the top during assembly. This adjusts the tension and pressure with which the cap 47 bears against the lower surface of the trap.

The shuttle body is grooved as at 48 and 49, Fig. 4, and pins 50 and 51 are inserted across these grooves to provide suitable wear surfaces against which the running thread may bear to prevent its contact with the wood or other material of the shuttle and to guide it in its travel after leaving the side eye 30.

According to a preferred embodiment, the shuttle body is formed as at 36, Fig. 1, to provide a relatively narrow groove between that surface 36 and the cooperating guide surface 35 of the block within which the thread may pass, but it is not essential that the body of the shuttle be formed precisely as illustrated or that the sur-

face 36 be as close to the material of the shuttle threading block as shown. In fact, the block will thread quite satisfactorily without the assistance of any cooperating surface of the shuttle body itself. In actual practice the contact of the thread is almost entirely with the guide surface 35 and with the exterior curved or bulging portion 29 of the trap and of the block whereupon it passes downwardly and beneath the trap to enter the side eye through slot 31.

Now having described various forms of the invention in considerable detail, the operation or functioning of the device involves certain steps which take place right after transfer has been completed and as the shuttle makes its initial pick after the replenishing function. Commonly the transfer is completed at or adjacent front center, and then as the lay moves rearwardly, the shuttle is picked at about one-half the rearward travel thereof at which time the end of the filling having been drawn outwardly from the supply just transferred to the shuttle is held as illustrated in the Patent 2,272,147, above mentioned. As the shuttle is picked the thread is disposed as illustrated in Fig. 1. Then the lay continues to move rearwardly and in cooperation therewith the outer end of the thread is moved forwardly slightly since the battery revolves throughout a small angular extent at that time. The result is that the thread is caused to draw off the supply over the end of the bobbin or other carrier and enters down into the slot 27 or between the tension pads 38 and 39, as the case may be, and due to the movement or forcing of the thread downwardly as it is drawn off the end 22 of the carrier, and under the influence of the pads as well, it is moved into the passage 26 or downwardly by the pads to the passage or to level 42, Fig. 9. At the same time the thread is cammed along surface 35 and outwardly about the bulging or curved portion 29 at the front side of the trap and since it is under considerable tension, just as soon as it passes that point it has every tendency or is influenced to snap inwardly to pass the point or hooked portion 32 of the trap whereupon it enters the converging slot 31, although it is to be understood that very little convergence of this particular slot is contemplated or is necessary. In actual practice the complete threading of the block occurs when the shuttle itself has entered the shed for about one-half the shuttle length. Thus before any thread is actually laid in the shed on the first pick, the filling is completely threaded and tension conditions have become standardized and will continue to remain the same throughout the remainder of that initial pick and for each pick following.

In the event the thread restraining device of Fig. 10 is employed, it is evident that the thread will snap beneath the point or hooked portion 32 of the trap and between that element and the top concave surface of the cap 47. The spring 46 is compressed slightly at that time and it is to be understood that very little tension in the spring is necessary. Once the thread has been completely threaded in that mechanism, it may even drop out of or down to the bottom of slot 31 until it rests upon the top surface or edge portions of the cap 47, but upon again being tensioned that thread will merely be lifted upwardly into side eye 30. It cannot actually become disengaged from the side eye, although it is to be understood that that may occur only at the most infrequent intervals, if at all, even without employing the

additional mechanism of Fig. 10 so long as the material at the side of the shuttle body and adjacent the trap and side eye is disposed slightly higher than the lowermost portion of the slot 31. That expedient in and of itself is not new, but is old and well known and described in U. S. Patent 835,230.

As shown in Figs. 1-3 the angular disposal of the thread entrance slot 27 is such that, once the thread has entered passage 26, it is virtually impossible for it to snap upwardly or in any other manner become disengaged therefrom. The same applies at the side eye entrance slot 31 and it is not necessary to provide slots of any great width since the threading function is facilitated due to the convergence of the slot as it enters the passage or side eye as the case may be, but no similar convergence is available to permit the thread to become disengaged.

In operation the thread is thus initially entered into the thread passage 26 or between the tension pads 38 and 39 and then follows downwardly and forwardly being cammed along the surfaces 35 and 29 to become positioned beneath the trap and to enter the slot 31 whereupon it becomes completely threaded as it enters side eye 30. That is a very simple construction and the actual threading function is influenced by a minimum of parts or surfaces practically all of which are elements of the block itself and thus need not be especially formed and assembled within the block nor is it necessary that such parts be maintained in perfect alignment and adjustment as has been the case with certain other shuttle threading blocks intended to thread at the first pick. It is also a special feature of the block that it functions to control threading very quickly during the first pick. The filling as it threads is maintained externally of or to the front of the entire block member itself except as it is restrained by the thread passage confined to the innermost portion of the block only.

Throughout the specification and claims reference has frequently been made to certain directions of movements or directions in which certain elements are disposed. Inwardly and outwardly refer respectively to the directions tending toward the inner portion or central portion of the loom and toward the end thereof at which transfer takes place and at which the replenishing mechanism is disposed. The terms forwardly and rearwardly refer to the directions toward the front or back of the loom, respectively.

The block functions equally well with regular or reverse winds, and the type of and material from which the thread is made may vary widely without sacrificing the efficiency with which the device is employed.

While the preferred construction contemplates use of inclined tension pads, they may be vertically disposed, but preferably are to be located as close as is reasonably practicable to the front of the block or shuttle.

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

I claim:

1. For use in a shuttle of the type in which a filling supply is automatically replenished, a

threading block adapted to thread completely on the first pick after replenishment which comprises means defining a thread passage at the inner end of the block, a thread trap at the outer, forward end of the block and an angularly disposed thread guiding surface between said passage and trap, a side eye at the lower portion of said trap and an upwardly directed entrance slot for said eye.

2. For use in a shuttle of the type in which a filling supply is automatically replenished, a threading block adapted to thread completely on the first pick after replenishment which comprises means defining a thread passage at the inner end of the block, a thread trap at the opposite end thereof, and an angularly disposed, downwardly extending thread guiding surface between said passage and trap, said trap comprising a forwardly directed curved portion into which the guiding surface is blended, a side eye at the lower portion thereof and an upwardly directed entrance slot leading into said eye.

3. For use in a shuttle of the type in which a filling supply is automatically replenished, a threading block adapted to thread completely on the first pick after replenishment which comprises means defining a thread passage at the inner end of the block, an entrance slot leading downwardly to said thread passage, a thread trap at the outer, forward end of the block and an angularly disposed thread guiding surface between said passage and trap, a side eye in said trap, said side eye being directed angularly toward the outer end of said block and having an upwardly directed entrance slot leading into said eye.

4. For use in a shuttle of the type in which a filling supply is automatically replenished, a threading block adapted to thread completely on the first pick after replenishment which comprises means defining a thread passage at the inner end of the block, a downwardly directed converging entrance slot for said passage, a thread trap at the outer, forward end of the block and an angularly directed curved guiding surface between said passage and trap, the said guiding surface being formed to blend into the outer forward portion of said trap thereby to serve in conjunction with adjoining portions of said shuttle with which the block is used, for guiding the thread beneath the said trap, a side eye in said trap and an upwardly directed entrance slot at the lowermost portion of the trap communicating with the said side eye for permitting the thread to enter that eye.

5. For use in a shuttle of the type in which a filling supply is automatically replenished, a threading block adapted to thread completely on the first pick after replenishment which comprises means defining a generally cylindrical and substantially horizontally disposed thread passage at the inner end of the block, an entrance slot extending downwardly from the top of the block and communicating with said passage, a thread trap at the outer, forward end of the block and an angularly disposed thread guiding surface extending between said passage and trap and comprising a forwardly directed curved portion and in extension thereof a portion reversed in direction to conform to the lower surface of the trap, a side eye at the lower portion of said trap and an upwardly directed entrance slot leading into said eye.

6. For use in a shuttle of the type in which a filling supply is automatically replenished, a

threading block adapted to thread completely on the first pick after replenishment which comprises means defining a thread passage at the inner end of the block, tension pads in said thread passage between which the thread is received preparatory to threading the shuttle at the first pick, a thread trap at the outer, forward end of the block and an angularly disposed thread guiding surface between said passage and trap, a side eye at the lower portion of said trap and an upwardly directed entrance slot for said eye.

7. For use in a shuttle of the type in which a filling supply is automatically replenished, a threading block adapted to thread completely on the first pick after replenishment which comprises means defining a thread passage at the inner end of the block, said thread passage having therein downwardly and rearwardly directed tension pads between which the thread is received and by which it is moved downwardly upon its entry into the block upon threading the shuttle at the first pick, a thread trap at the outer, forward end of the block and an angularly disposed thread guiding surface between said passage and trap, a side eye at the lower portion of said trap and an upwardly directed entrance slot for said eye.

8. For use in a shuttle of the type in which a filling supply is automatically replenished, a threading block adapted to thread completely on the first pick after replenishment which comprises means defining a thread passage at the inner end of the block, downwardly and rearwardly directed tension pads in said passage, a thread trap at the outer, forward end of the block and said trap comprising a forwardly directed curved portion into which the guiding surface is blended, said curved portion reversing its direction and extending rearwardly of the block adjacent the lower portion of the trap, a side eye at the lower portion of the trap, and an upwardly directed entrance slot leading into said side eye.

9. In combination, a shuttle and threading block for threading completely on the first pick after transfer, said shuttle having a filling carrier receiving recess and a threading block retaining cavity, said threading block comprising means defining a thread passage at the inner end thereof adjacent the said recess, a thread trap at the outer, forward end of the block, and an angularly disposed, forwardly and downwardly directed thread guiding surface between the passage and trap, a side eye in said trap and an upwardly directed entrance slot leading into said eye, the shuttle block receiving cavity further having a forwardly and downwardly inclined thread guiding surface spaced from and substantially parallel to the guiding surface of the block and serving in combination therewith to lead the thread downwardly beneath the trap and into the side eye therein.

10. In combination, a shuttle and threading block for threading completely on the first pick after transfer, said shuttle having a filling carrier receiving recess and a threading block retaining cavity, said threading block comprising means defining a thread passage at the inner end thereof adjacent the said recess, a thread trap at the outer, forward end of the block, and an angularly disposed, forwardly and downwardly directed thread guiding surface between the passage and trap and merging into the forward portion thereof to continue rearwardly be-

11

neath the trap, a side eye in said trap and an upwardly directed entrance slot leading into said eye, the shuttle block receiving cavity further being so formed as to have a forwardly and downwardly inclined thread guiding surface spaced from and substantially parallel to the guiding surface of the block and serving in combination therewith to lead the thread downwardly beneath the trap and into the eye, the front edge of said cavity being slightly higher than the lowermost portion of the trap to prevent release of the thread from the side eye.

11. In combination, a shuttle and threading block for threading completely on the first pick after transfer, said shuttle having a filling carrier receiving recess and a threading block retaining cavity, said threading block comprising means defining a thread passage at the inner end thereof adjacent the said recess, a thread trap at the outer, forward end of the block, and an angularly disposed, forwardly and downwardly directed thread guiding surface between the passage and trap, a side eye in said trap and an upwardly directed entrance slot leading into said eye, the shuttle block receiving cavity having a forwardly and downwardly inclined thread guiding surface spaced from and parallel to the guiding surface of the block, a side eye entrance slot closing cap restrained to move upwardly toward said trap and resilient means to retain said cap in contact with the lower part of said trap, but away from the trap slightly upon passage of the thread into the slot and eye.

12. For use in a shuttle of the type in which a filling supply is automatically replenished, a threading block adapted to thread completely on the first pick after replenishment which comprises

12

means defining a thread passage at the inner end of the block, an entrance slot leading downwardly to said thread passage, a thread trap at the outer, forward end of the block and an angularly disposed thread guiding surface between said passage and trap located entirely at the forward side of the block and therefore defining the front bounding surface thereof, a side eye in said trap, said side eye being directed angularly toward the outer end of said block and having an upwardly directed entrance slot.

13. A shuttle threading block as defined in claim 12 wherein the lowermost portion of the thread passage is in substantial alignment with the side eye, but disposed at a slightly higher level as compared to the lowermost portion of the side eye.

14. A shuttle threading block as defined in claim 12 wherein the entrance slots leading to the thread passage and to the side eye are inclined at a slight angle to the direction of travel of the thread through the block after it has become fully threaded.

ANTONIO VILLANI.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,405,452	Snow	Feb. 7, 1922
1,720,410	Davis	July 9, 1929
2,059,756	Spencer	Nov. 3, 1936
2,272,147	Brown	Feb. 3, 1942
2,341,848	Snow	Feb. 15, 1944
2,385,756	Brown	Sept. 25, 1945