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 [33] **Switzerland**
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[54] DEVICE FOR FORMING COILS OF THREAD

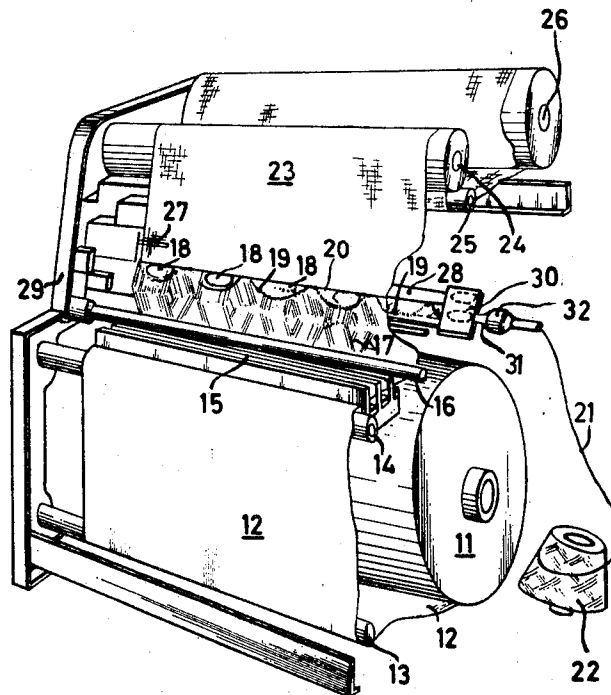
16 Claims, 10 Drawing Figs.

[52] U.S. Cl..... 139/12
 [51] Int. Cl..... D03d 47/26
 [50] Field of Search..... 66/125;
 139/12, 13, 122, 1, 127

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ABSTRACT: A device for forming coils of thread of a predetermined length on a loom, which includes a coiling element, a rotor for winding a thread around the coiling element to form coils of the thread thereon, the coiling element being mounted to rotate on the rotor, a retaining arrangement for preventing rotation of the coiling element and a means for periodically displacing the coils of thread along the coiling element. The retaining arrangement has two separate retaining means which retain and release the coiling element in a mutually alternating manner so that during the displacement of the coils over the retaining zone of one retaining means, it is positioned or moved away from its retaining zone and the other retaining means is positioned to retain the element.



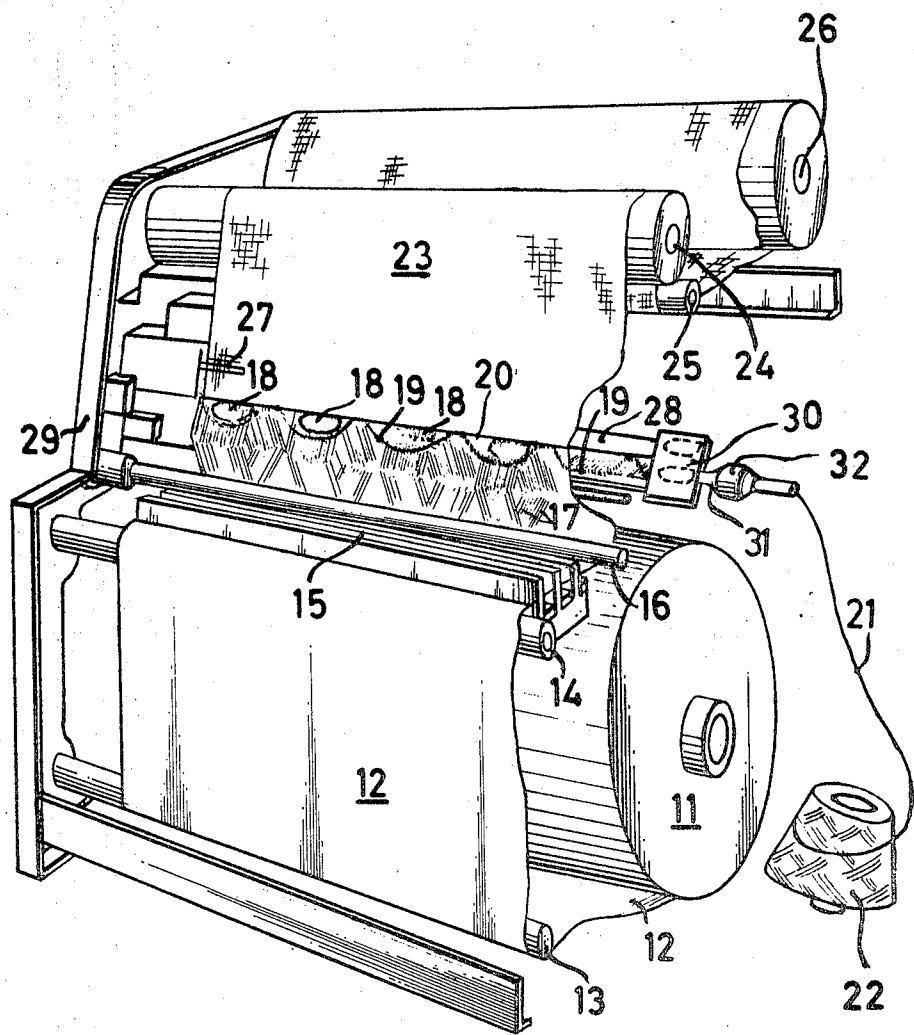


Fig.1

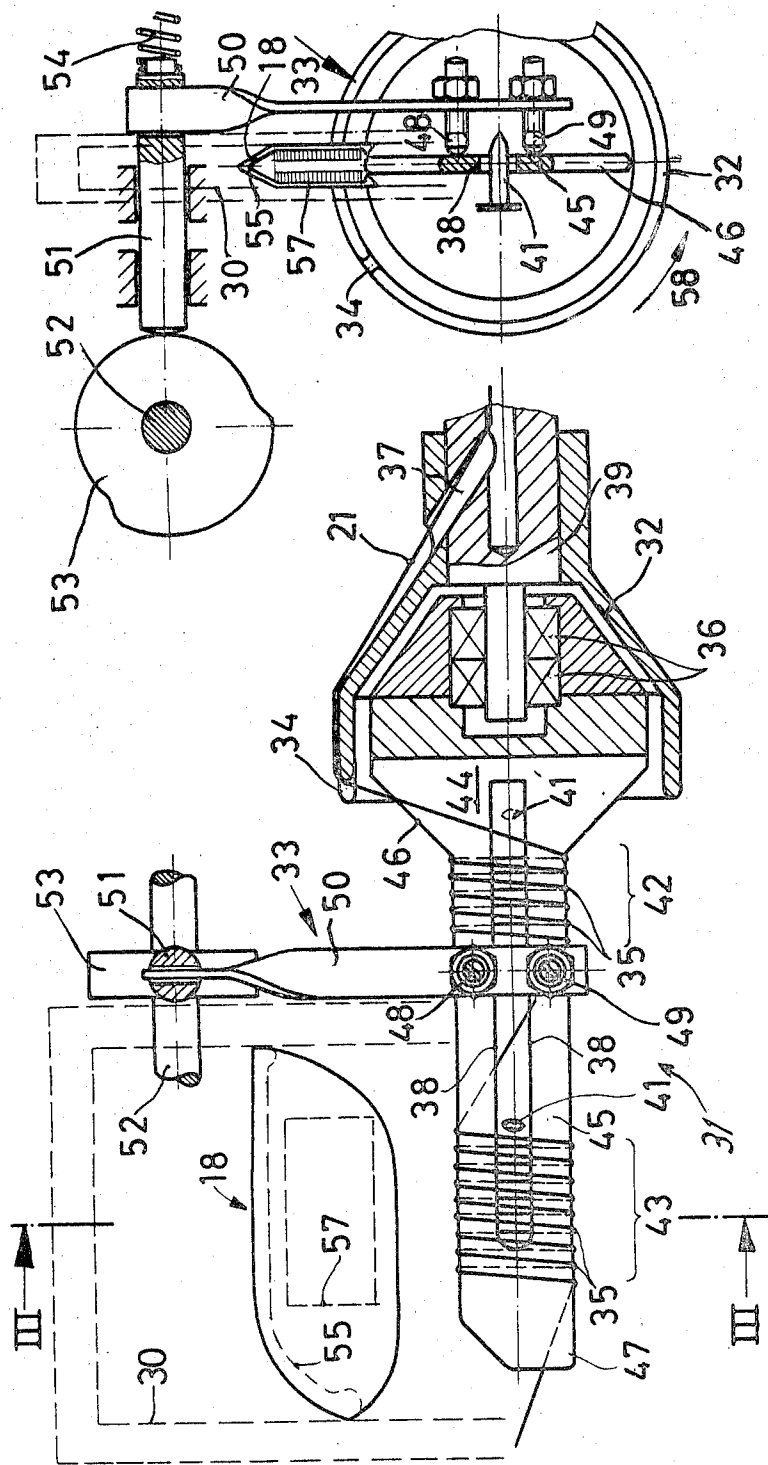
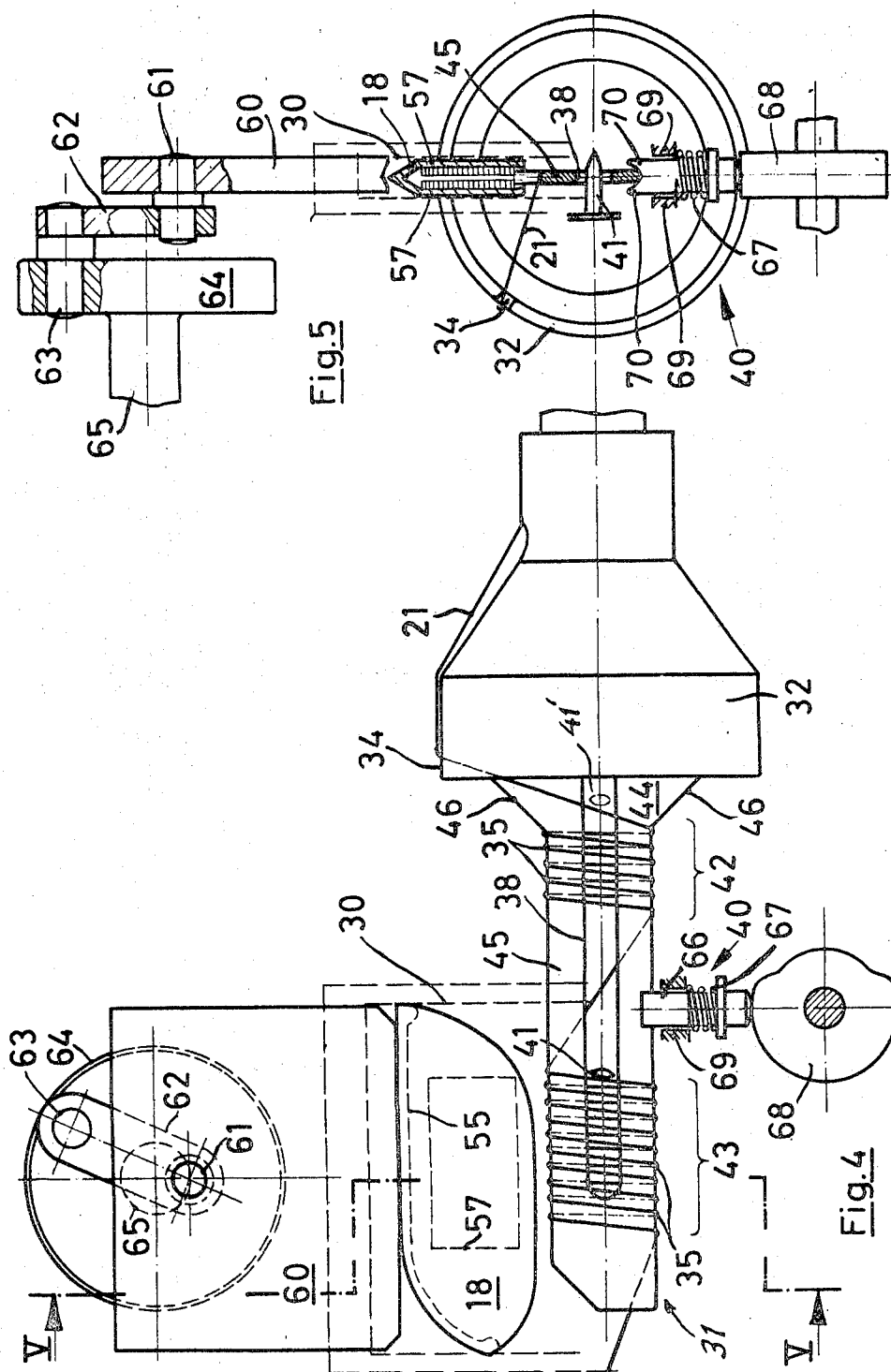
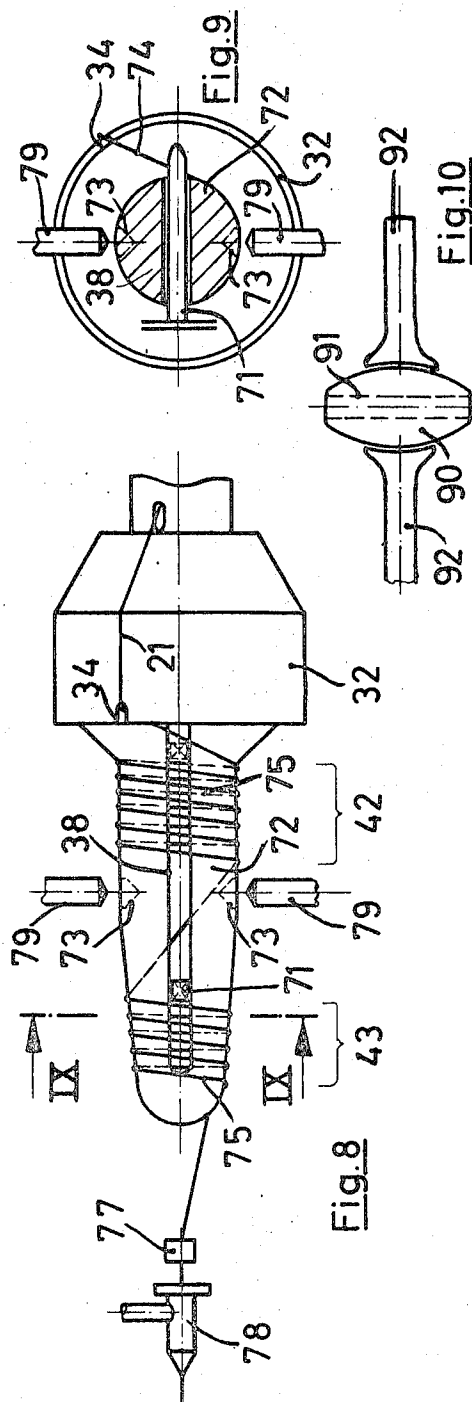
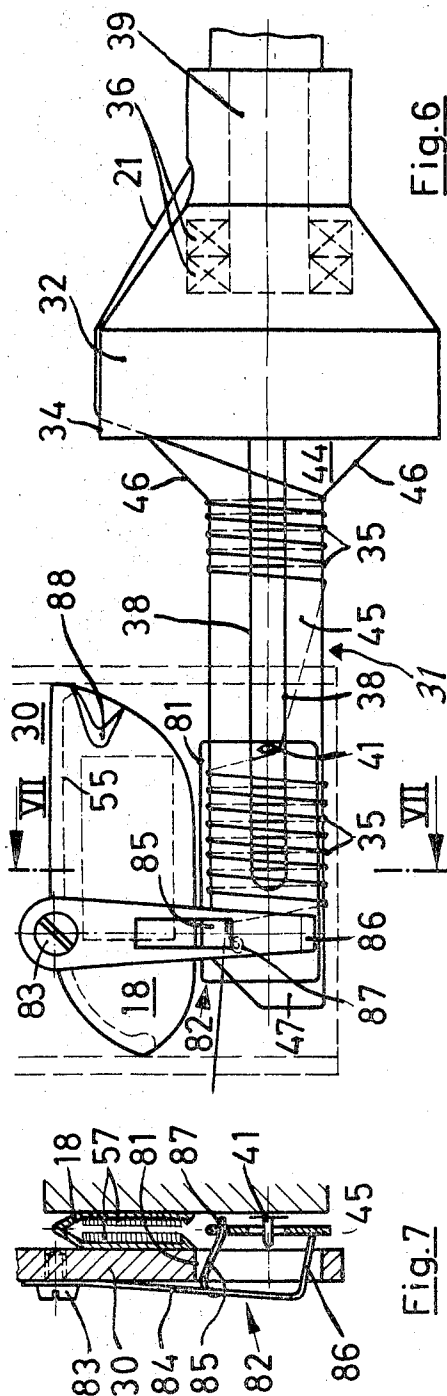


Fig. 3

Fig. 2





DEVICE FOR FORMING COILS OF THREAD

This invention relates to a device or apparatus for forming coils or windings of thread having a predetermined length and more particularly to a device, on a loom, that has a rotating means, for winding a thread around a coiling element mounted to rotate on the rotating means, a retaining arrangement for uniquely preventing rotation of said coiling element, and means for periodically displacing the resulting coils of thread along the coiling element.

A method and an apparatus for forming coils of thread of predetermined length on a loom are known wherein the coils are formed on a blade-shaped element. For the purpose of winding the thread around the blade, an eye through which the thread passes and which is carried by the rotor rotates around the blade-shaped element. This element is mounted to rotate in the rotor and is itself prevented from rotating about its own axis by means of two channel-shaped jaws. For the purpose of forming the coils of predetermined length, the windings are pushed in batches along the blade-shaped element into a delivery position. In this operation, the coils must slide along and within the two channel-shaped retaining jaws. This has the disadvantage that the neat arrangement of the individual turns of thread within each coil, established during the winding operation, can be spoiled. This also can have a deleterious effect in the subsequent weaving process. Furthermore, the channel-shaped jaws occupy a certain amount of space, so that the blade must be lengthened to an extent corresponding to this space. The greater length however results in the disadvantage that the support means for mounting the blade on the rotor must be strengthened to an extent corresponding to this length.

The purpose of the present invention is to eliminate these disadvantages. Thus, this invention contemplates a device for forming coils of thread having a predetermined length that is further characterized in that the retaining arrangement comprises at least two separate retaining means which retain and release the coiling element in a mutually alternating manner such that during the displacement of coils of thread over the retaining zone of one retaining means, this one means is positioned or moved away from its retaining zone and the other means carries out its retaining function.

The device of this invention thus offers the advantage that it is possible to use narrow retaining means so that the lengthening of the winding element necessitated thereby is, for all practical purposes, unimportant. Moreover, it is of particular importance, that the coils of thread are unimpeded by the retaining arrangement during the winding operation and during their displacement along the coiling element.

The invention will now be further described in greater detail with reference to the accompanying drawings in which:

FIG. 1 shows the position of the device of the invention for forming coils of thread on a wave-type loom;

FIG. 2 illustrates details of an embodiment of the device of the invention as seen from the front of the loom;

FIG. 3 is a sectional elevation of the embodiment shown in FIG. 2 taken along the line III-III;

FIG. 4 is a front view of a second embodiment of the device of the invention;

FIG. 5 is a side view, partially in section, of the embodiment of FIG. 4 taken along the line V-V;

FIG. 6 shows a third embodiment of the device as seen from the front;

FIG. 7 is a sectional view of the third embodiment taken along the line VII-VII in FIG. 6;

FIG. 8 is yet another embodiment of the device as seen from the front;

FIG. 9 is a sectional view taken along the line IX-IX of the embodiment shown in FIG. 8; and

FIG. 10 shows a further variant of the retaining element of the invention.

In all the FIGS., like reference numerals designate like elements.

The wave-type loom shown in perspective in FIG. 1 comprises a warp beam 11. The warp threads 12 run from this beam around a shed-equalizing roller 16 via the guide rolls 13 and 14 and a warp thread monitor 15. Immediately beyond the shed-equalizing roller, the warp threads 12 are formed into a shed by means of an arrangement of healds (not illustrated) comprising substantially horizontal healds; an open shed 17 being present for each weft-inserting element or shuttle 18 and a shed change taking place between each two adjacent shuttles 18 or open sheds 17. This operation is indicated in the drawing by appropriate hatching. For the purpose of weaving, a plurality of weft-inserting elements in the form of shuttles 18 is provided, these moving simultaneously and successively with the sheds 17. Shuttles 18 are moved forward by the reeds 19 which function as drive members. These reeds also serve to beat up the inserted weft threads against the edge 20 of the resulting fabric.

The warp threads 12 guide the shuttles 18 in the sheds 17. The reeds 19 are incorporated in the control unit 28 which is firmly secured to the frame 29 of the loom. For the purpose of moving the reeds 19, the unit 28 contains two worm shafts which are not visible in FIG. 1. When the worm shafts rotate the reeds 19 are pivoted about an axis in such a manner that each reed 19 moves a little ahead of the reed fitted in front of it during its cycle of movement. This results in the reeds 19, as a whole, executing an undulatory movement which, as seen in FIG. 1, progresses from right to left and which carries the shuttles 18 along through the sheds. The sheds 17 also move at the same speed from right to left. The woven material 23 is passed over the pull-in roll 24 and the pressure-applying roll 25 and is wound on to the cloth beam 26. Reference 27 indicates a temple.

Provided on the right-hand side of the loom is a discharge box 30 from which empty shuttles 18 are supplied in a continuous sequence. Adjacent to the discharge box 30 is located a blade-shaped coiling element or means 31 on which are formed coils of thread of a predetermined length. The thread 21 for forming these coils is received from the bobbin 22 and is wound onto element 31 by the rotor 32.

Details of the device or means for forming the coils of thread including elements 30, 31 and 32 can be seen in FIGS. 2 and 3. The discharge box 30 is shown in broken lines and the shuttle 18 is shown as not being covered by the sides of the box 30. On the blade-shaped coiling element 31 (having two sections or parts 44 and 45) are located a coil 35 of thread at each of the zones 42 and 43. The coils 35 are formed in the zone 42 and the coils 35, located in the transfer zone 43, are ready to be transferred to the shuttle 18. The coiling element 31 is mounted by means of the ball bearing unit 36 in the rotor 32 which rotates continuously while the loom is operating. Due to the rotation of the rotor 32 a slight torque is transmitted to the coiling element 31 by friction via the ball bearing unit 36. Also, the coiling element is subjected to a second torque in the same direction as the first, due to the thread-coiling operation. The direction of these torques is indicated by the arrow 58. In order to prevent the winding element 31 from turning, it is held by the retaining element 33. The ball bearing unit 36 is mounted on the rotatable spindle 39, to which the rotor 32 is firmly connected. The rotor 32 carries an eye or aperture 34 through which the thread 21 is drawn. The thread 21 runs from the supply bobbin 22, shown in FIG. 1, through a channel 37 in the spindle 39 and through the eye 34 and on to the coiling element 31 on which it is wound.

The coiling element or blade 31 comprises two different parts or portions 44 and 45. One part is the winding section 44 which has inclined edges 46 and the second part is the coiling section 45. The edges of the coiling section 45 are almost parallel and run towards each other in the direction of the free end 47 of the element only to a minimal extent so that the coils can be readily displaced to the left from the zone 42, where they are formed, to the transfer zone 43. The pin 41 is used for shifting the coils 35 along element 31. For the purpose of

effecting this displacement, the pin 41, in the position indicated by dashed lines on the right of FIG. 2 by the reference numeral 41', is pushed forward through the slot 38 contained in the element 31. It is then pushed to the left into the position marked by the reference numeral 41 on the left of FIG. 2. After the shift has taken place the pin is again moved to the rear out of the slot 38.

One retaining means of the invention includes a retaining element 33 that has two fingers 48 and 49 and that is movable between two positions parallel to the longitudinal axes of the fingers 48, 49. One of these positions corresponds to that shown in FIG. 3. In this position one end of each of the fingers 48 and 49 moves into supporting or holding zones on the section 45 and in contact therewith or at most only a very short distance removed therefrom. In the other position, the ends of the fingers 48 and 49 are positioned at least a distance from their supporting zones on section 45 such that the coils 35 to be moved along the element 31 do not touch the fingers 48 and 49. The fingers 48 and 49 are supported by positioning and actuated by means including the carrier or arm 50 which is mounted on the slide bar 51 that can slide in guides. A cam disc 53, secured to the spindle 52, upon rotation, moves the slide bar 51 in its longitudinal direction, the bar 51 being continuously biased towards the cam disc 53 by means of the compression spring 54. This arrangement achieves the above-mentioned movement of the retaining element 33 towards and away from the section 45.

The shuttles 18 are passed through the discharge box 30 in such a way that they always hold a position in which they are parallel with themselves. They are moved downwardly in a continuous sequence. The shuttles 18, as shown in FIG. 2, each have an elongated body with two sides interconnected to provide a shell-like configuration, i.e. the body has two sides which define an opening along a part of its periphery to allow entry of a coil of thread into the interior of the shuttle. The two sides of the shuttle are interconnected near the line 55, but they are separate from each other over the remaining areas. A bristle or plush lining 57 is fitted on the inner surface of each side of the shuttles 18. These linings 57 serve to retain the thread coils 35 within the shuttle.

When the loom is operating, the rotor 32 rotates continuously in the direction of the arrow 58 as seen in FIG. 3. Thread 21 is thereby continuously wound around the winding part 44 of the coiling element and the thread windings or turns immediately slide along the inclined edges 46. During this operation the individual turns of thread bear against each other on that part of the winding section 45 adjacent to section 44, i.e. zone 42. The windings already present there are pushed to the left along the coiling section 45 and in this way a coil 35 is formed. During this process, the retaining element 33 is located in a position in which it retains, i.e. bears against, the blade portion 45 of element 31, that is to say a peripheral portion of the cam disc 53 having the smaller radius is in contact with the slide bar 51.

The next shuttle 18 is then dispatched by a thrust element, (not shown in the embodiment of FIGS. 2 and 3), the shuttle being pushed in the downward direction by this element. (An embodiment of a thrust element of this kind and of the drive therefor is shown in FIGS. 4 and 5.) The shuttle 18 is thrust downwardly to an extent such that its edge 55 moves almost or entirely into contact with the upper edge of the section 45. The shuttle 18 is thus pushed over the coil 35 located in zone 43. As previously mentioned, and as best seen in FIG. 3, the shuttle is held in a position parallel to its length by the sidewalls of the discharge box 30, so that the element 31 is now prevented from rotating by another retaining means which includes the shuttle 18 that has been pushed over the coiling elements.

As soon as the coil 35, comprising a prescribed number of turns, has been formed over the zone 42, the pin in its right-hand position as in FIG. 2 is pushed forward through the slot 38 and is shifted to the left together with the shuttle 18 pushed over the section 45 i.e. at zone 43. At the same time the cam

disc 53 actuates the elements 50 and 51 to lift the fingers 48 and 49 from the section 45. Due to this movement of the pin 41, a coil 35 is shifted from the zone 42 to the zone 43. While the shuttle, which has been pushed over the zone 43, is being simultaneously with the pin pushed to the left away from the part 45 towards the shed 17, it pulls the coil 35, that was located in the zone 43, away from the part 45 by means of the plush lining 57 and retains it in its interior. The eccentric disc 53 is of such shape that the retaining element 33 only comes to rest on the coiling part 45 again via free ends of fingers 48 and 49 after the coils 35 are shifted from zone 42 to 43, and before the shuttle 18 is moved completely away from the end 47 of the part 45.

It will be seen from the foregoing that the coils 35 of the thread are moved along the element 31 while the threads will not touch the retaining element 33 during this movement; thus no overlying of individual turns takes place as a result of their displacement relative to each other. Element 31 on the other hand is continuously held against rotation either by the retaining element 33 or by the shuttle 18 which acts as a retaining means when it is positioned around zone 43.

The fingers 48 and 49 of the retaining element 33 are each provided with a screw-thread adjustment. By rotating the fingers 48 and 49 they can be adjusted in their longitudinal direction as required. In this way, the angular position in which the element 31 is held by the element 33 can be adjusted. This adjustability is utilized to obtain precise angular positioning of the element 31 in correspondence with the position of the shuttle 18. The purpose of this is to position the sides of the shuttle 18 in a precise manner on both sides of the part 45 when the shuttle is pushed over this part.

It will be appreciated that it might be necessary to provide only one finger 49, since the torque applied to the element 31 operates only in the direction of the arrow 58. On the other hand there is the possibility of undesired movements, e.g. vibrations, occurring in the element 31 so that more reliable angular positioning is achieved when two fingers are used.

The further embodiment of the invention illustrated in FIGS. 4 and 5 again incorporates a retaining arrangement which is comprised of two retaining means, one of which is likewise provided by the shuttle 18 and the other comprising a reciprocal retaining member 66. In the drawings the rotor 32 with the eye 34 through which the thread 21 runs is again shown. The shuttles 18 with their plush linings 57 are again passed through the sidewalls of the discharge box 30. Also provided is a coiling element comprising the coiling part 45 and the winding part 44 with edges 46 and the slot 38. For the purpose of shifting the turns of the thread along the coiling element 31, the pin 41, as previously described, can be moved through, along, and again out of the slot 38.

In the description of the embodiment shown in FIGS. 2 and 3, no drive means were illustrated or described for pushing the shuttle over the part 45. This feature was not described in order to facilitate a ready understanding of this embodiment without describing an excessive number of elements. The drive means will now be described by reference to FIGS. 4 and 5. This means also be used in the embodiment of FIGS. 2 and 3. It comprises a pusher 60 which passes through the discharge box 30. A spindle 61 is securely connected to the pusher. The lever 62 is secured both to the spindle 61 and a spindle 63 so as to rotate therewith. The spindle 63 is attached firmly to a wheel 64 which can be driven by the shaft 65 that is coupled to the drive mechanism of the loom. When the wheel 64 rotates, the lever, by executing a swinging movement about the spindle 61, moves the pusher 60 up and down. The pusher 60 is thus passed through the discharge box 30.

The rod 66 on the retaining element 40 is continuously downwardly biased by the compression spring 67. When the eccentric disc 68 rotates, the rod is periodically urged upwards, thereby moving in the guide 69. Two divergent projections 70 (FIG. 5) on the upper free end of the rod retain the coiling element 31 in a prescribed angular position. One revolution of the main shaft of the loom (not shown)

corresponds to one revolution of the cam disc 68 and one revolution of the wheel 64.

When the loom is operating, the rotor 32 executes a prescribed number of revolutions e.g. 40, for each revolution of the main shaft of the loom. With each revolution of the main shaft the pin 41 pushes through the slot 38 at that point on the winding part 44 shown in dash lines (in FIG. 4 at the right-hand end of the slot 38 and designated by reference numeral 41'), and then moves leftwards along the slot to the position designated by the numeral 41 wherein it again moves out of the slot 38. In doing so the pin shifts a coil 35 comprising a number (40) of turns leftwards along the part 45, the number of turns corresponding to the prescribed number of revolutions of the rotor 32 per revolution of the main shaft. Before a coil 35 has been displaced by the pin 41, a shuttle 18 will have been pushed over the left-hand coil 35 (zone 43) on the element 31 by means of the pusher 60. From this moment on, this displaced shuttle 18 secures the coiling element 31 against rotation. At the same time the cam disc 68 allows the finger or rod 66 to move in the downward direction. As soon as this has happened the pin 41 can cause the above-mentioned displacement of the coil 35 of thread from zone 42 to zone 43. This displacement occurs simultaneously with the leftwards movement of the shuttle 18 positioned over and around the part 45. By means of its plush linings 57, the shuttle 18 retains in its interior the coil 35 over which the shuttle has been pushed. The cam disc 68 is of a form such that the retaining element is urged upwards again immediately before the displaced shuttle 18 leaves the part 45 and after the coil 35 has been pushed from zone 42 into zone 43. In this manner the coiling element 31 is continuously prevented from rotating. Furthermore, due to the divergent arrangement of the projections 70, the element 31 is held in the same angular position or moved back again into it.

A further embodiment of the device of the invention will be described by reference to FIGS. 6 and 7. These FIGS. again show the previously mentioned rotor 32, its spindle 39, and the eye 34 for the thread, the coiling element 31 containing the slot 38, and the ball bearing unit 36. Shuttles 18 are dispatched in a continuous sequence from the discharge box 30'. The box 30' contains an opening 81. In this embodiment one retaining means includes a retaining member 82 that is resiliently secured to the discharge box 30 by means of a screw 83. The retaining member comprises an element 84 which is made from a flat strip of resilient material and which, as seen in FIG. 6, is located on the side of the box 30 presented to the viewer. Secured to the strip 84 are elements or arms 85 and 86 which slope downwardly through the opening 81 as shown in FIG. 7. In the position of the retaining member 82 illustrated in FIG. 7, a projection on the element 85 extends downwards into an opening 87 contained in the blade-shaped section 45. This projection is for retaining that turn of the left-hand coil 35 positioned farthest to the left on the section 45, i.e. so as to prevent this turn from moving towards the free end of the section 45 and thus becoming unwound.

In order to enable the retaining member 82, used for holding the outermost turn of the coil 35, also to be employed as an element for retaining the element 31, this member also has the additional arm 86. The free end of arm 86 lies against the section 45 when the element 82 is in the position illustrated in the drawings. Thus, under these conditions, the coiling element 31 is accurately held in its angular position, i.e. in its perpendicular position, by the arms 85 and 86.

When, with the loom operating, a shuttle 18 is pushed over the section 45, due to the inclined position of the arm 85, the shuttle pushed the arm 85 to the left (in FIG. 7) at the moment at which the shuttle 18 begins to hold the element 31. When this happens, the strip 84 bends (as it is made of resilient material), and the arm 86 is also lifted away from the section 45. The element 31 is now only held by the shuttle 18 until the shuttle moves away from section 45 by shifting to the left. Shortly before this happens, element 85 slides off the shuttle 18 at the rear end thereof. Due to the rear portion of the shut-

tle 18 being inclined, element or arm 86 is no longer positioned over the body of the shuttle at this moment. Thus the retention of the coiling element is again taken over by the retaining element 82 until the next shuttle is again pushed over section 45 of the coiling element.

When it is desirable to bring the retaining part 82 into contact with the blade part 45 as rapidly as possible at a given spring force of the strip 84, it is of advantage to provide a recess 88 in rear portion of each of the shuttles 18. The more rapid movement of the elements 85, 86 into contact with the section 45 thereby achieved also causes that turn of the coil 35 shifted into the transfer zone that is located farthest to the left to be securely held by the retaining arm 85, i.e. to be prevented from becoming unwound.

The embodiment shown in FIGS. 8 and 9 illustrates yet another form of construction for a loom wherein the weft thread is inserted into the shed by means of a fluid. In this embodiment there is a rotatable coiling element 72 on which a thread, passed through a slot 34, is wound by the rotor 32. Coils 75 are formed on the coiling element 72 and these are pushed by the pin 71 leftwards from the zone 42 into the zone 43 towards the free end of the coiling element 72. In this embodiment the coiling element is no longer in the form of a blade and instead is in the form of a rodlike member having a round cross section. Also the coiling element tapers in a pronounced manner towards its free end. The thread passes from the coil 75 seen on the left in FIG. 8 through a guide 77 and into a nozzle 78 through which it is injected or blown into the shed. To prevent the coiling element 72 from turning, there is provided a retaining means comprising a pair of fingers 79. Also a supporting or holding zone, formed by a complementary depression 73, is provided in the coiling element 72 for each of the fingers 79. These depressions 73, as illustrated in FIG. 9, are of a configuration that widens outwardly into the shape of a V (that extends in a direction at right angles to the longitudinal axis of the coiling element 72). When the fingers 79 are located in the depressions 73 they prevent the coiling element 71 from rotating. They can be moved into and out of the depressions 73.

When the loom is operating, coils 75 are continuously wound onto the coiling element 72 by the rotor 32. During the displacement of the coils by the pin 71, both fingers 79 are moved away from the coiling element 72. During this phase of operation the coiling element 72 is prevented from turning by the shifter pin 71 acting as a retaining means. After a coil 75 has been shifted from zone 42 into zone 43, the fingers 79 move towards each other into the depressions 73 and hold the coiling element 72 in an accurately predetermined angular position. Any deviation from such a position are corrected by the fingers 79 always moving to the deepest points in the corresponding depressions 73. The pin 72 is then withdrawn from the slot 38 and the thread is inserted in the shed by means of the nozzle 78, the coil 75 in the zone 43 being pulled off the coiling element 71. As this is happening, the fingers 79 also prevent turns from being pulled away from the coil 75 in the zone 42.

The retaining means described in the above embodiments represent particularly effective forms of such means. Additional forms of these means are, however, possible. For example, if appropriately designed, the fingers can carry a braking pad at their free ends and can simply be pressed against the surface of the coiling element, so that no depressions, such as those designated by reference numerals 73, are required.

Particularly in the case of a weft-inserting system wherein the threads are inserted into the shed by a nozzle, a towed shuttle or the like, the coiling element 90 can be of oval cross section as illustrated in FIG. 10. The slot 91 for the thread pusher can extend along the major axis of the oval cross section. One retaining means can comprise two fingers 92 which broaden at their free ends and which have bearing surfaces corresponding to the shape of the coiling element 90 and which can be alternately brought into contact with and

moved away from the coiling element 90 over part of the length or lateral surfaces of this element. It is of course also possible for a slot to be positioned at right angles to the slot 91 shown in FIG. 10. In this case the retaining fingers would bear against the narrow sides of the coiling element 90 in a similar manner to that employed in the case of the finger 66 shown in FIG. 4.

In regard to other forms of construction, it will be seen that in the embodiments illustrated in FIGS. 8, 9 and 10 the provision of two fingers provides the advantage of symmetrical loading of the coiling element. It will however be appreciated that it is quite possible to provide only a single finger in these embodiments.

In the embodiments illustrated in FIGS. 2, 3, 4, 5, 6, 7, 8 and 9, one retaining means is specifically designed for use in combination with the shuttles 18, the retaining member 82 and the pusher pin 71 respectively, i.e. with a member performing a textile-producing function on the thread-coils 35 and 75, respectively, of predetermined length. It is also possible to retain the coiling element by means of two retaining means neither of which performs such a function. Referring to FIG. 8, a second retaining element for example similar to the element having the two fingers 79 may likewise have two fingers which come to rest on the free end of the cylinder 72 in depressions contained in the cylinder. In this case, the fingers of the second retaining element are in contact with the rod 72 during the shifting of the coil 75 from zone 42 to zone 43 and lift from the member 72 after the shift has taken place and after the fingers 79 have moved back into the depressions 73, whereupon the weft thread is inserted. Since, in the meantime, the retaining function is again taken over by the fingers of the first retaining element, these prevent one or more turns being inadvertently entrained by the coil 75 in the zone 42 during insertion of the weft thread.

It will be appreciated that appropriate means (not shown) maybe provided on the loom for cutting that portion of the weft thread that extends from the shuttle already in the shed (and from the thread that has been beaten up by the reeds) to the next entering shuttle. The cutting means may be located at the front of each shuttle so that the thread entering the shed upon becoming taut is cut or the cutting means may be positioned outside of the shed in front of the shuttle discharge box and operated in rhythm with the movement of the shuttles so that the desired thread portion is cut outside of the shed.

Moreover, it will be appreciated that appropriate pusher means (not shown) are also provided for displacing or pushing each of the loaded shuttles that contain a coil of thread into the adjacent shed of the loom. The pusher means may, in a known manner, be positioned adjacent to the shuttle located on the transfer zone of the coiling element and coupled to the drive mechanism of the loom so that the loaded shuttles are periodically displaced from the coiling element simultaneously with the shifting of the coils of thread along the coiling element.

I claim:

1. A device for forming coils of thread of a predetermined length on a loom, which comprises a coiling element; rotating means for winding a thread around the coiling element to form coils of the thread thereon, said coiling element being rotatably mounted on said rotating means; a retaining arrangement for preventing rotation of said coiling element and means for periodically displacing the coils of thread along said coiling element; said retaining arrangement comprising two separate retaining means and means for positioning said retaining means to retain and to release the coiling element in a mutually alternating manner such that during the displacement of each of said coils of thread over a retaining zone of one of said retaining means, said one retaining means is positioned by said positioning means away from its retaining zone to release said coiling element while the other retaining means is positioned by said positioning means in its retaining zone in contact with the coiling element.

2. The device of claim 1 in which one of the two retaining means is a means that also performs a textile-producing operation with said coils of thread.

3. The device of claim 2 in which the one of the two retaining means that performs a textile-producing operation includes a retaining member which, when it is laterally supported on the coiling element in its retaining zone, also retains the coils of thread against displacement in a longitudinal direction along the coiling element.

4. The device of claim 2 in which the one of the two retaining means that performs a textile-producing operation comprises a plurality of shuttles for inserting successive coils of the thread into successive sheds formed by the loom, each of said shuttles having an elongated body open along part of its periphery to receive a coil of thread, the coils of thread on said coiling element being transferred to said shuttles by successively pushing each of the shuttles over a coil of thread arranged on the coiling element and subsequently by moving each shuttle away in the longitudinal direction of the coiling element and guide means for guiding said shuttles to keep the shuttles parallel to themselves while said coils of thread are transferred to the shuttles.

5. The device of claim 4 in which the rotating means for winding thread onto the coiling element includes a rotor, said coiling element has a free end, an end operatively associated with the rotor and in the direction extending away from the rotor, a first zone for forming coils of thread of predetermined length, and a second zone for receiving the displaced coils of thread over which each of said shuttles can be pushed, and the other retaining means comprises a retaining member located adjacent to said second zone to retain the coiling element prior to being displaced by the shuttle that pushed is over said coiling element.

6. The device of claim 2 in which said coiling element has a longitudinal slot and the one of the two retaining means that performs a textile-producing operation includes a pusher rod, said positioning means pushing said pusher rod through the longitudinal slot, moving said rod along said slot to displace said coils of thread and then withdrawing said rod from said slot whereby said coiling element is retained as the pusher rod is moved along said slot.

7. The device of claim 1 in which the rotating means for winding the thread on the coiling elements includes a rotor, said coiling element has a free end, an end operatively associated with said rotor and in the direction extending away from the rotor, a first zone for forming coils of thread of a predetermined length, and a second zone for receiving the displaced coils of thread, one of the two retaining means is located between the first and second zone on said coiling element, and the other of the two retaining means is movable along the second zone of the coiling element in contact with said element.

8. The device of claim 1 in which said one retaining means has two retaining fingers that are symmetrically disposed in relation to the longitudinal axis of the coiling element and are movable together to contact adjacent portions of said coiling element.

9. The device of claim 1 in which said one retaining means comprises a common carrier and two retaining fingers which are attached to said common carrier in parallel arrangement with each other, and are adjustable in directions parallel to their lengths.

10. The device of claim 1 in which said coiling element has at least one holding zone that cooperates with one of said retaining means and said one of the retaining means has an end portion that contacts a holding zone on the coiling element, said end portion so cooperating with the holding zone of said element that said element is positioned in a predetermined angular position.

11. The device of claim 10 in which the end portion of said one retaining means has two retaining fingers and the coiling element has a blade-shaped section with an elongated cross section, said two fingers being disposed on either side of a

plane and being movable parallel therewith, said plane passing through the longitudinal axis of the coiling element and extending in a direction perpendicular to the longitudinal direction of the cross section of said element.

12. The device of claim 11 in which said coiling element has two holding zones for contact with said two fingers, said zones each lying in a plane perpendicular to the longitudinal axis of the coiling element.

13. The device of claim 10 in which said coiling element has an elongated portion with an oval-shaped cross section and a holding zone is located on a broad side of the coiling element, and the end portion of said one retaining means has a finger with a widened portion at the end that contacts the coiling element, the contacting surface of said end matching the shape of the holding zone in a direction extending transversely of the coiling element.

14. The device of claim 10 in which the coiling element has a blade-shaped section with an elongated cross section and the holding zone is located on a narrow side of the coiling element

and the end portion of said one retaining means forms finger having two projections which diverge from each other in the form of a V.

15. The device of claim 10 in which the holding zone on the coiling element is formed by a depression therein, which, in the direction perpendicular to the longitudinal direction of the coiling element has a shape that widens outwards in the form of a V, and said end portion of said one retaining means has a finger that is movable into and out of the depression.

16. The device of claim 1 in which one of the two retaining means comprises at least one retaining finger, said positioning means moving said finger to and fro between a holding position in its retaining zone wherein one of its ends bears on a portion of the coiling element and a return position outside of said zone in which said one end is removed from said portion of the coiling element, said one end being located in the return position during the displacement of the coils of thread over said portion of said coiling element.

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