United States Patent [19]

Eilhauer et al.

[11] **3,762,449**

[45] **Oct. 2, 1973**

[54] **LOOM**

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[73] Assignee: **Emil Jager K.G.**, Munster, Dahlweg, Germany

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[21] Appl. No.: **143,675**

[30] **Foreign Application Priority Data**

May 30, 1970 Germany ..... P 20 26 604.0

[52] **U.S. Cl.** **139/127**

[51] **Int. Cl.** **D03d 47/12**

[58] **Field of Search** .....139/122 R–127 P, 128, 133

[56] **References Cited**

UNITED STATES PATENTS

1,352,610	9/1920	Knapp	139/127 R
2,548,663	4/1951	Fletcher et al	139/123
3,140,633	7/1964	Vincent	139/127 P

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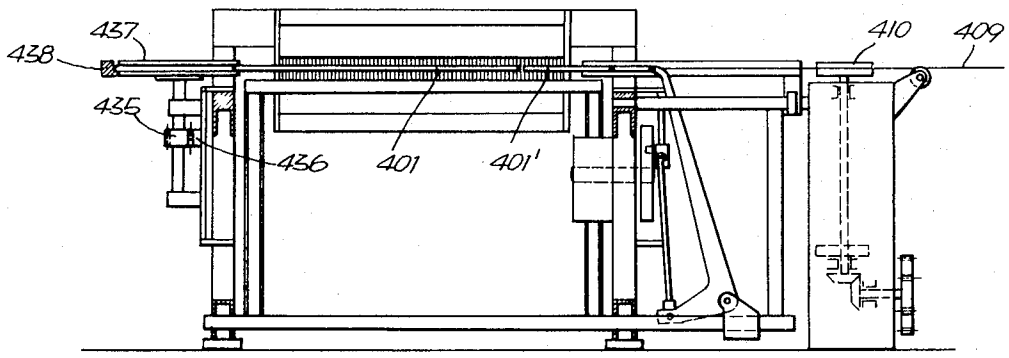
[57] **ABSTRACT**

A loom for producing fabrics of wires of metal or plastic which is provided with a guide tube movable from one side of the loom into the shed for guiding the weft wire or with a pair of guide tubes movable from the opposite sides into the loom toward each other for passing the weft wire from one guide tube to the other. The guide tube or tubes may be either rigid or flexible. If flexible, the guide tube may be wound on or off a wheel which is partly surrounded by a guide which holds the guide tube on the wheel and also guides the guide tube from the wheel in the direction of the weft.

9 Claims, 13 Drawing Figures



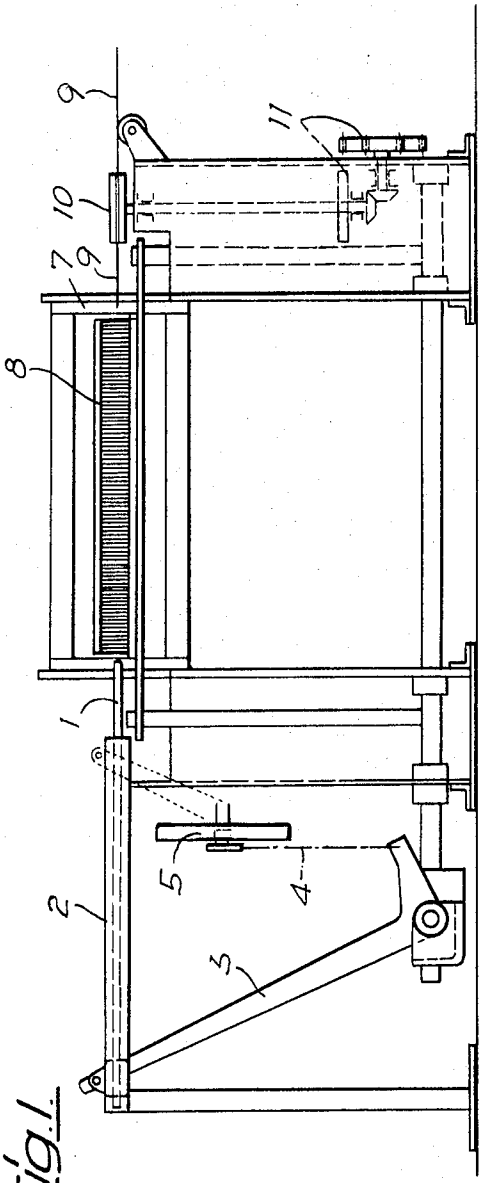


Fig. 1.

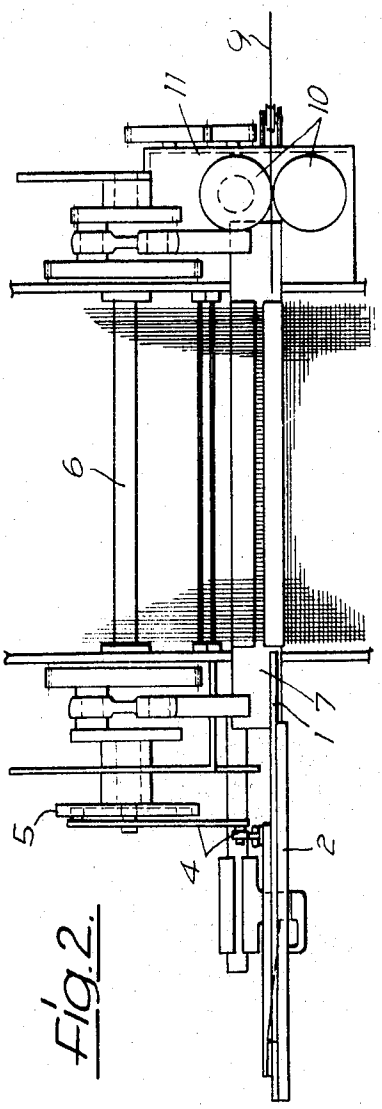


Fig. 2.

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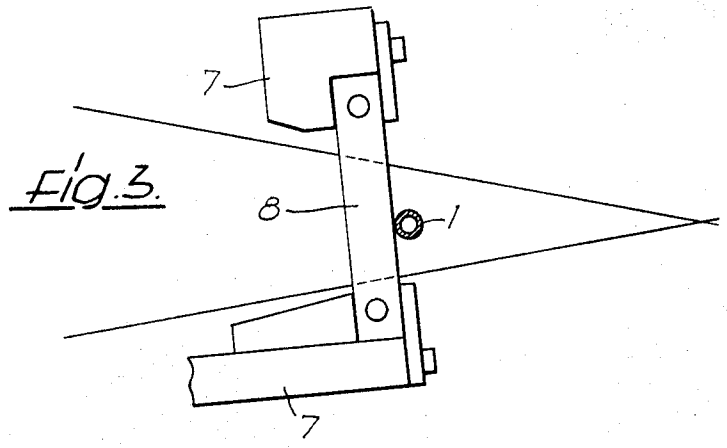

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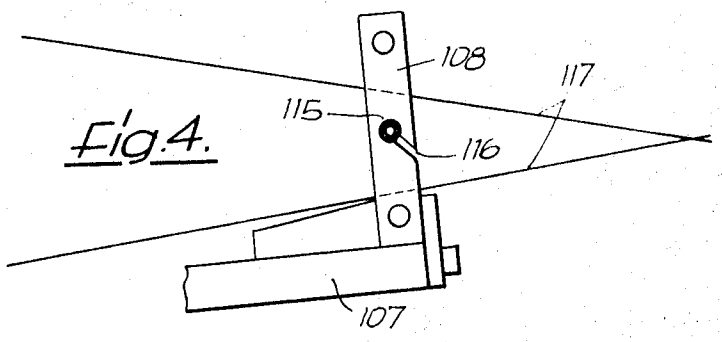

Fig.4.

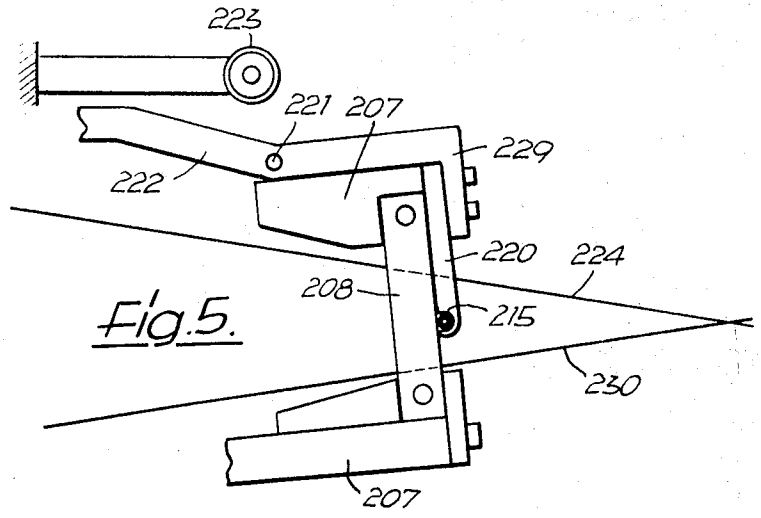

Fig.5.

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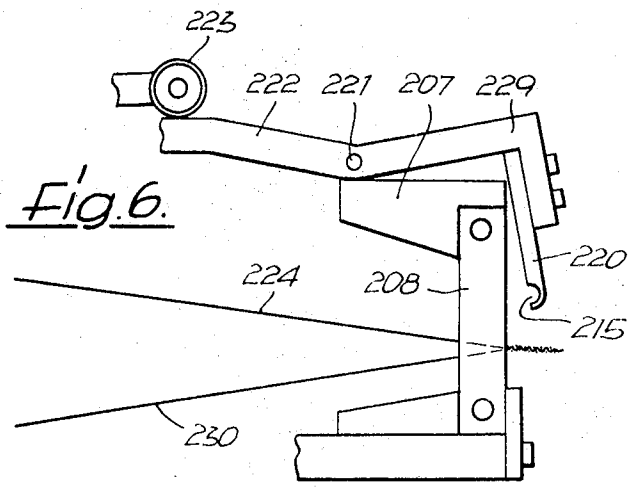
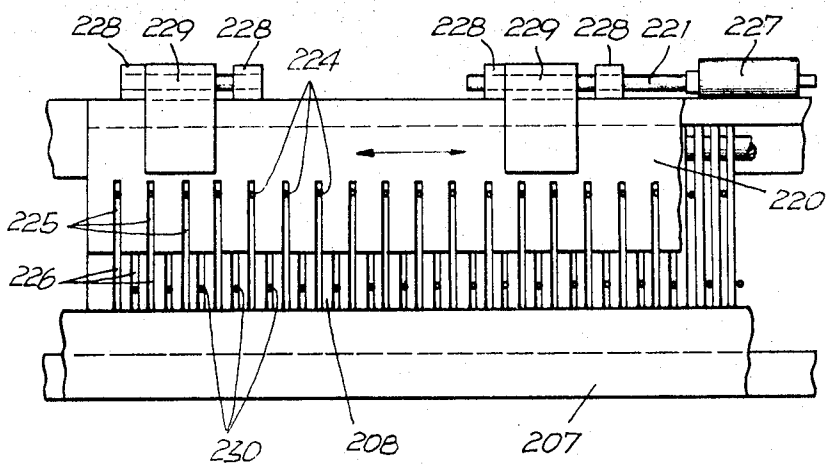


Fig. 6.

Fig. 7.



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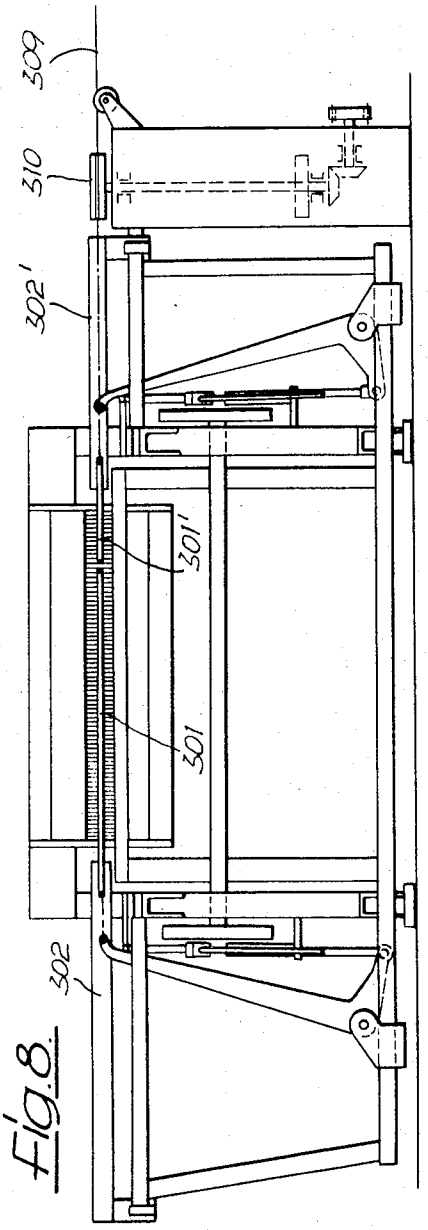

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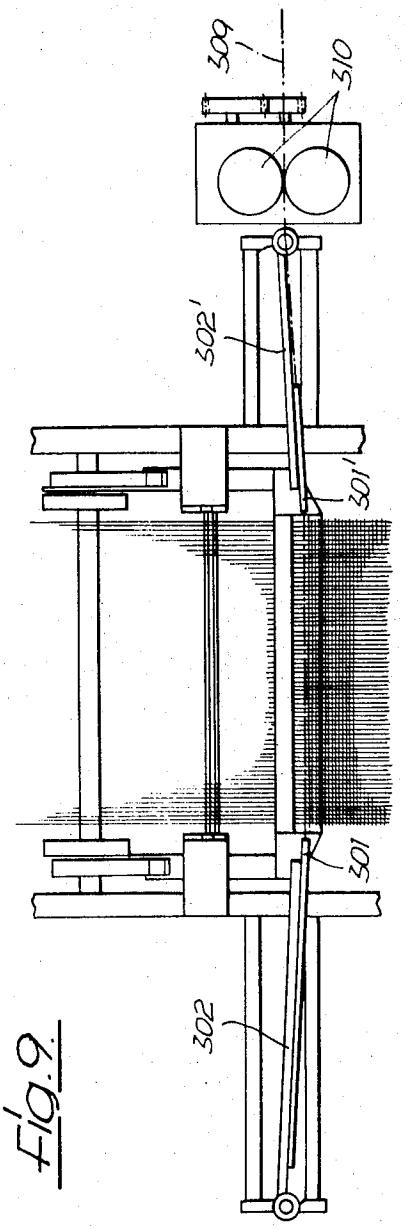

Fig. 9.

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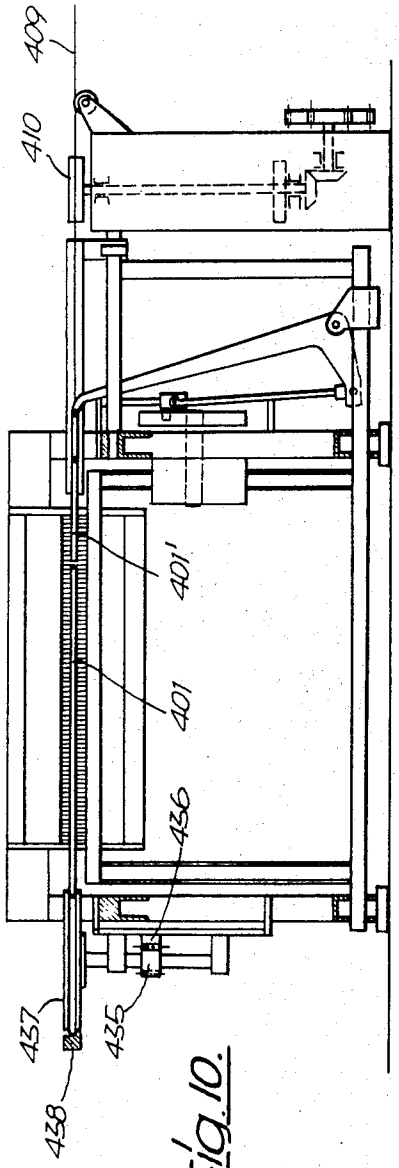

Fig. 10.

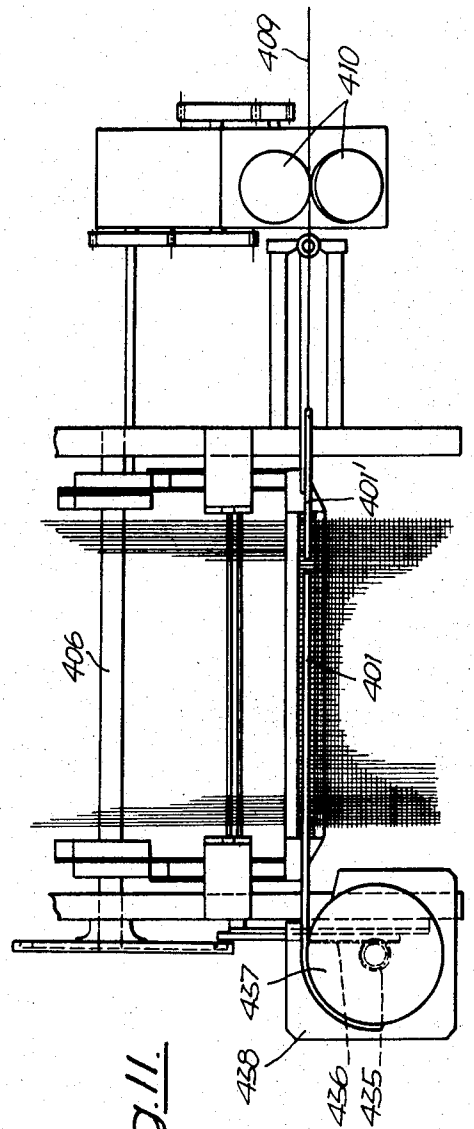

Fig. 11.

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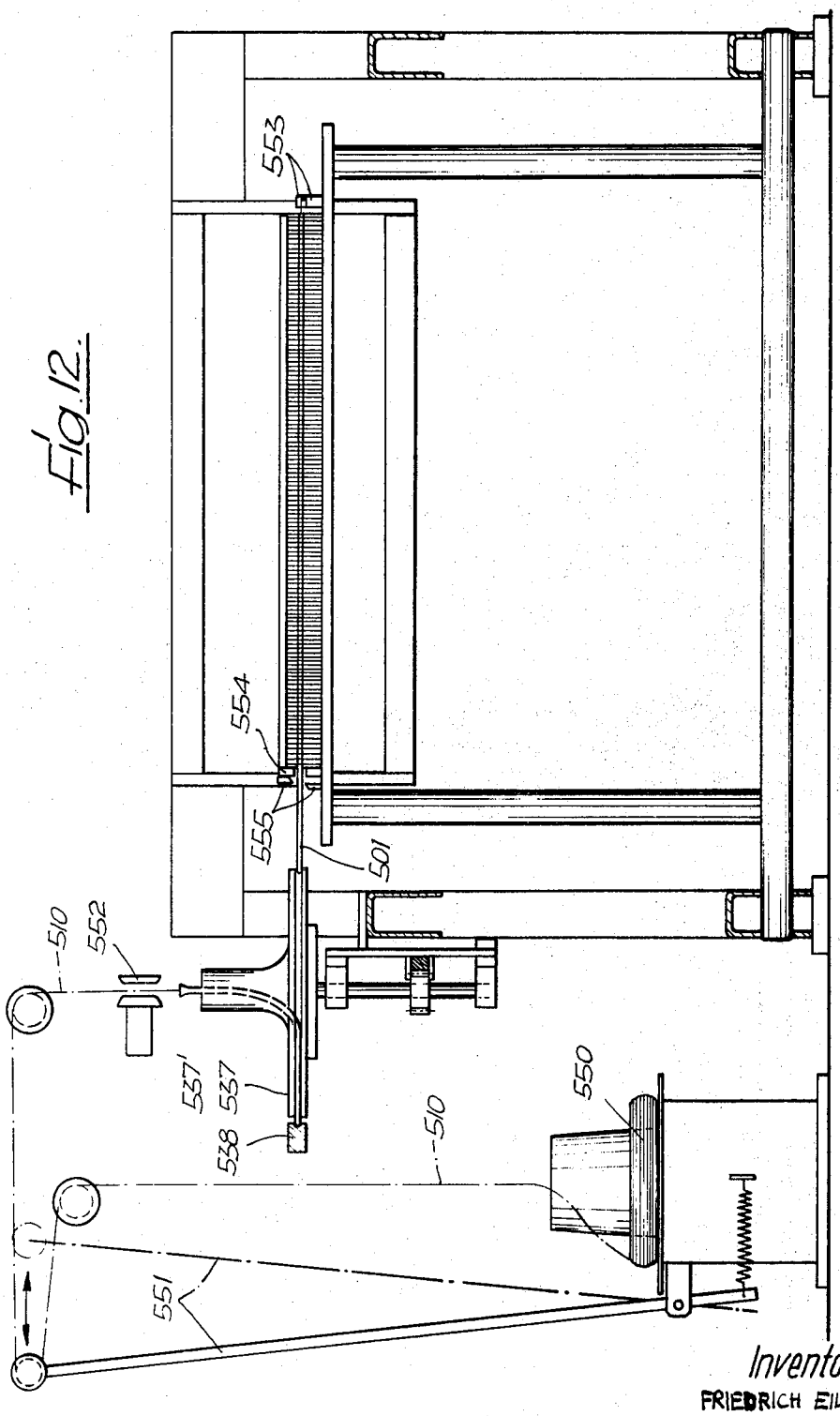
Fig. 12.



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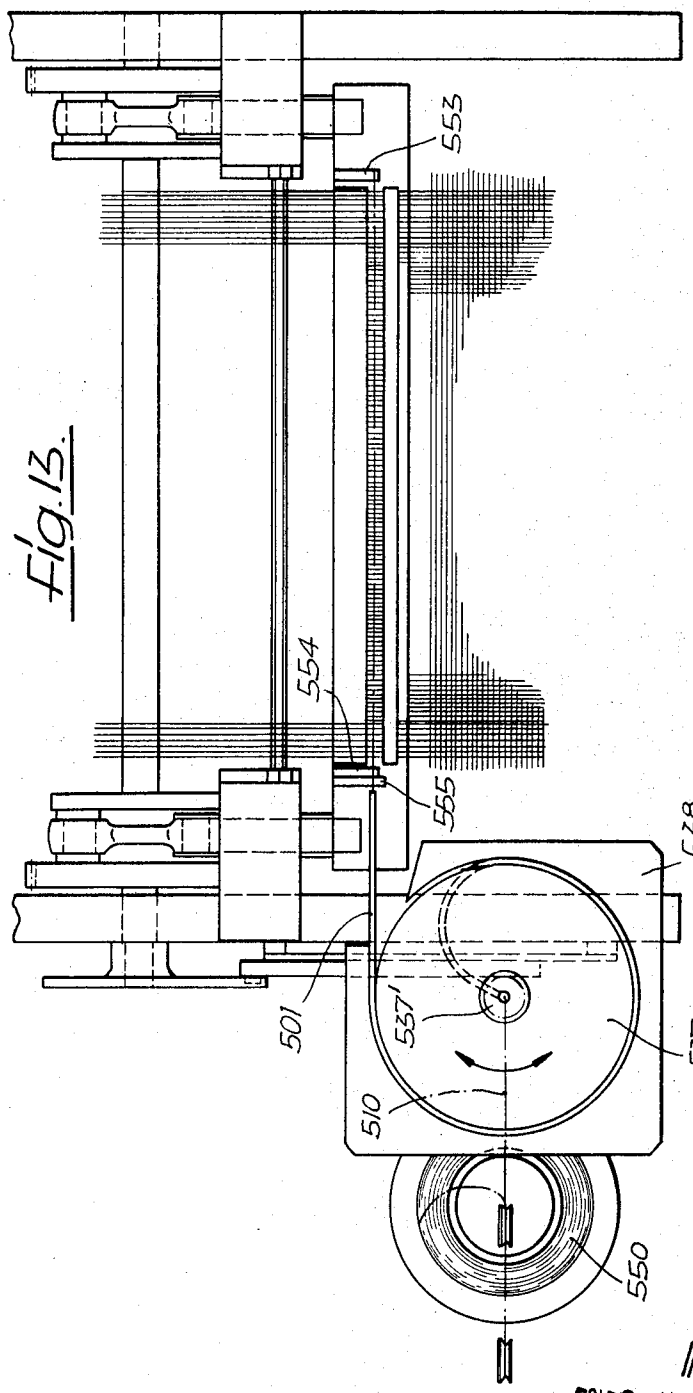

Fig. 13.

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LOOM

The present invention relates to a loom for producing fabrics consisting of wires of metal or plastic, and more particularly to such a loom which is provided with a new mechanism for inserting the warp wires into such a fabric.

In looms of this type as were known prior to this invention the reed is provided along its entire length with a groove through which the weft wire is passed by a feeding mechanism for inserting into the shed. In order to release the weft wire after it has been inserted, the reed of such a loom is made of two parts which are divided from each other by a longitudinal plane which extends through the groove. This known mechanism for inserting the weft wire into the shed has the disadvantage that the slots which have to be provided in the reed for receiving the warp wires intersect the groove at short distances from each other. These points of intersection often cause interferences since the front end of the warp wire may hit against and be stopped by the walls of the slots. This may occur especially if the wires are very flexible and consist, for example, of plastic or if the wires have an initial curvature. These difficulties increase the smaller the slot spacing of the reed is made, that is, the less the adjacent slots in the reed are spaced from each other. Below a certain size of this spacing, this type of construction can therefore no longer be employed in actual practice.

It is an object of the present invention to provide a loom which comprises a mechanism which also permits very flexible warp wires or warp wires with an initial curvature to be inserted, even though the slot spacing of the reed is very small.

For attaining this object, the invention provides that this mechanism comprises at least one guide tube for the weft wire which is movable back and forth in its longitudinal direction and is adapted to be inserted from one side into the shed in the direction of the weft.

Such a guide tube forms a smooth guide channel along which the weft wire may be easily moved with very little friction, even though it is very flexible or has an initial curvature. Such a guide tube has the further advantage that the diameter of its guide channel may be easily made in accordance with the particular diameter of the weft wire which is to be used. This is especially of importance if very thin weft wires are employed since they can be pushed through a guide channel without difficulty only if this can be done without buckling of the wire. The diameter of the guide channel may be varied very easily and quickly so as to be in accordance with the diameter of the particular weft wire to be used by providing a series of guide tubes which have different inner diameters and may be easily exchanged for each other.

In addition to the provision of a guide tube which may be passed from one side into the shed, it is a feature of the invention according to another embodiment thereof to provide a second guide tube which is likewise movable back and forth in its longitudinal direction and may be inserted from the other side into the shed in the direction of the weft so that the end of this second guide tube facing the end of the first guide tube is in axial alignment with the latter and is adapted to be moved so as to be spaced at a very small distance from the end of the first tube or to be in abutting engagement with the latter. When the two guide tubes are moved to

such a position toward each other, the first tube will transfer the weft wire from its end into the second tube. This embodiment of the invention is particularly of advantage since it permits the loom to be operated at a higher speed because the distance which each of the two tubes has to travel is smaller than the distance which the guide tube of a mechanism has to travel which is only provided with a single tube. When employing a weft wire of a sufficient rigidity, the speed of operation of such a mechanism with two guide tubes may be further increased by starting the retraction of the tubes away from each other immediately after the end of the weft wire has passed from the first to the second tube. This may be done because it has been found that, when employing a weft wire of this type, no interferences will occur in the operation even though such a wire is not guided by the guide tubes along the entire width of the fabric.

Whether each of the two guide tubes should be moved into the shed up to the center of the width of the fabric or whether they should penetrate for different diameters into the fabric depends upon the particular manner in which the weft wire is fed. If the weft wire is moved by feed rollers and if it is necessary that the feeding speed of the wire must at first be low, as it is usually required if the weft wire is very flexible, a higher operating speed and output of the loom may be attained if the receiving guide tube is moved for a greater distance into the fabric than the delivering guide tube.

Instead of employing rigid guide tubes, it is another feature of the invention according to a further embodiment thereof to employ flexible guide tubes. Such tubes have the advantage that they may be wound up and will therefore require less space at one or both sides of the reed. They are therefore more preferable to rigid guide tubes especially in looms of a large operating width. Of course, when employing two guide tubes in cooperation with each other it is also possible to provide one of these tubes of a rigid type and the other of a flexible type. Such a combination may be particularly of advantage, for example, if the two guide tubes are to be movable for different distances into the fabric.

If a guide tube is to be flexible, it is another feature of the invention to provide a winding mechanism for such a tube which comprises a rotor which carries the tube and is alternately rotatable in one or the other direction about its axis, and further comprises a guide element which surrounds a part of the circumference of the rotor. If the rotor is provided, for example, in the shape of a hubbed wheel and one end section of the flexible guide tube is passed from the outer peripheral surface of the wheel in the form of a spiral to the center of the hub at the free outer end thereof, this end of the guide tube may extend in a direction coaxially to the wheel and its hub. With such a winding mechanism it is extremely simple to pass the weft wire from its supply toward this free end of the guide tube and to insert it therein.

If the guide tube or guide tubes are sufficiently rigid, they may be inserted into the shed without requiring any guide means. If, however, they do require guide means, the reed may be provided with a guide groove which extends along the entire length of the reed and in which the guide tube or the two guide tubes may be guided while they are located within the shed. Since the guide tubes even when flexible are considerably more

rigid than flexible weft wires, such a guide tube will not hit against the walls of the slots in the reed which intersect the guide groove. Instead of providing the guide groove within the comb teeth of the reed, it is also possible according to another embodiment of the invention to provide a second reed which is adapted to be applied upon one side of the first reed and is provided with a groove which extends in the direction of the weft and the open side of which faces the first reed and will be closed by the surface of the first reed when the second reed is applied against this surface. For releasing the weft wire, suitable means are provided for temporarily moving the second reed away from the first reed. Such a second reed has the additional advantage especially when the spacing between the adjacent slots in the reeds has to be very small that the number of slots required in the second reed only has to be one half of the number required in the first reed because the slots are needed only for the warp wires which are located at one side of a shed. However, if the second reed only has one half of the number of slots as are provided in the first reed, it is necessary at every new formation of a shed to shift the second reed longitudinally for the distance of one slot spacing of the first reed.

The features and advantages of the present invention will become more clearly apparent from the following detailed description thereof which is to be read with reference to the accompanying drawings, in which

FIG. 1 shows a front view of the essential parts of a loom according to a first embodiment of the invention which is provided with a single rigid guide tube;

FIG. 2 shows a top view of the parts of the loom as shown in FIG. 1;

FIG. 3 shows an enlarged side view of the reed of a loom according to FIGS. 1 and 2, and a cross section of the rigid guide tube which is inserted into the shed;

FIG. 4 shows a side view of a reed according to a modification of the invention which is provided with a longitudinal groove for guiding the guide tube;

FIG. 5 shows a side view similar to FIGS. 3 and 4 of another embodiment of the invention in which two reeds are operatively associated with each other;

FIG. 6 shows another side view of the two reeds according to FIG. 5, but with the second reed in the opened position;

FIG. 7 shows a front view of the two reeds according to FIGS. 5 and 6;

FIG. 8 shows a front view similar to FIG. 1 of parts of a loom according to another embodiment of the invention, in which this loom is provided with two rigid guide tubes;

FIG. 9 shows a top view of the parts of the loom as shown in FIG. 8;

FIG. 10 shows a front view similar to FIG. 1 of parts of a loom according to a further embodiment of the invention, in which this loom is provided with a rigid guide tube and a flexible guide tube;

FIG. 11 shows a top view of the parts of the loom as shown in FIG. 10;

FIG. 12 shows a front view similar to FIG. 1 of parts of a loom according to still another embodiment of the invention, in which this loom is provided with a single flexible guide tube; while

FIG. 13 shows a top view of the parts of the loom as shown in FIG. 12.

Referring to the drawings, FIGS. 1 and 2 show a part of a loom for producing fabrics of wires of metal or plastic. For inserting the weft wire, this loom is provided according to the invention with a rigid guide tube 1 which is movable in its longitudinal direction within a guide bar 2. This guide bar 2 is mounted at one side of the loom adjacent to the position where the shed is formed, and the longitudinal axis of this guide bar and that of guide tube 1 extend in the direction of the weft. Guide tube 1 which is directed toward the shed is driven back and forth in its longitudinal direction by means of a bell crank 3 which is pivotably connected by a connecting rod 4 to a cam 5 which is mounted on a main shaft 6 which also drives the sley 7 of the loom.

Guide tube 1 and guide bar 2 are made of such lengths that the guide tube may pass completely through the shed and will in all positions during its movements be adequately guided by guide bar 2. As illustrated in FIG. 3, guide tube 1 when being inserted into the shed will engage upon the front side of the reed 8 but will not not be supported by the latter on its lower side.

Guide tube 1 has an inner diameter substantially in accordance with the diameter of the particular weft wire 9 which is to be used, and in order to permit fabrics also to be woven with weft wires of other diameters, guide tube 1 is mounted in guide rail 2 so as to be easily exchanged for one of another inner diameter and to be removably connected to bell crank 3.

At the side of the loom opposite to that where guide bar 2 is mounted, a pair of feed wheels 10 for the weft wire 9 is mounted and in such a position that the weft wire 9 extending between these wheels will be in straight alignment with the axis of guide tube 1. As may be seen in FIG. 1, the pair of feed wheels 10 are mounted in this particular embodiment of the invention on the upper ends of a pair of vertical shafts which are likewise driven by the main shaft 6 through a gearing 11.

When the sley 7 is pivoted back and disposed in the position as illustrated in FIG. 3, bell crank 3 will shift the guide tube 1 along the front side of reed 8 within the center of the shed and completely through the latter in the direction of the weft. The weft wire 9 is then inserted into guide tube 1 and passed through the latter until its end projects slightly beyond the edge of the fabric facing the guide bar 2. Guide tube 1 is then again retracted from the shed and thereby releases the weft wire 9 which during this period is gripped by the pair of feed wheels 10. After guide tube 1 has left the shed completely and the weft wire has been cut off, sley 7 is pivoted forwardly so that reed 8 can beat the weft wire against the warp wires. Thereafter, sley 7 is again pivoted back, whereupon the same cycle of operations is started again.

If the guide tube is not sufficiently rigid and not sufficiently guided to be passed freely through the shed without bending, reed 108 may be provided with a bore 115, as shown in FIG. 4, which extends through its entire length and is located within the points of intersection of its planes of symmetry. Reed 108 is further provided with a slot 116 which extends from bore 115 in an oblique downward direction to the front side of reed 108 and is open at this side. The diameter of bore 115 and the outer diameter of the guide tube are made of such sizes that the guide tube will be easily slidable along and properly guided by the wall of bore 115. In all other respects the loom is designed in the same manner as the loom according to FIGS. 1 to 3. Therefore,

when the sley **107** is pivoted back and located in the position as shown in FIG. **4**, the guide tube slides through and is guided by the wall of bore **115**, and after the weft wire has been moved across the entire width of the cloth the guide tube is again retracted. The weft wire may then pass through the slot **116** into the shed which is defined at the upper and lower sides by the warp wires **117**. Thereafter, reed **108** beats the weft wire forwardly against the warp wires.

Of course, a reed as illustrated in FIG. **4** may also be employed in any other embodiments of the loom according to the invention.

It it is desirable or necessary to guide the guide tube within the shed but the reed should not be provided with a bore for this purpose, a second reed **220** as shown in FIG. **5** may be provided which is mounted on the sley **207** so as to be pivotable about an axis **221**. This second reed **220** may be applied in the manner as shown in FIG. **5** against the front side of the first reed **208** which may be of the usual construction. The lower end of the second reed **220** which, when this reed engages upon the first reed **208**, is located at the level of the center of the shed, is provided in its side facing the first reed with a groove **215** which forms a guide channel for the guide tube and is closed when reed **220** engages upon the first reed.

By the provision of an actuating arm **222** which is rigidly secured to the second reed **220** and projects toward the rear beyond the sley **207**, and by providing a roller **223** which is rotatably mounted in a fixed position on the frame of the loom, the second reed **220** will be pivoted about the axis **221** in a counterclockwise direction from the position as shown in FIG. **5** when the sley pivots forwardly, since the actuating arm **222** will then be pressed downwardly by the roller **223**. The lower end of the second reed **220** will thereby be pivoted away from the first reed so that groove **215** will be opened. This opening movement is necessary since the weft wire, which at first lies within the guide tube which is inserted into the groove, passes into this groove when the guide tube is again retracted from the shed.

Of course, as also shown in FIG. **7**, the second reed must be likewise provided with slots for the warp wires **224** which limit the shed on one side. It is, however, not necessary to provide the second reed **220** like the first reed with a number of slots in accordance with the total number of all warp wires but, as illustrated in FIG. **7**, the second reed only needs to be provided with the number of slots **225** which is required for taking up the warp wires **224** which limit the upper side of the shed, that is with one half of the number of slots which are required in the first reed. This is of advantage particularly if the slot spacing is very small and the adjacent slots **226** of the first reed **208** are therefore spaced at a very small distance from each other.

If the second reed **220** is only provided with slots for the upper warp wires **224**, it is necessary before a new shed is formed to shift the second reed in the weft direction for the distance of one slot spacing of the first reed. In the particular embodiment of the invention as illustrated in FIG. **7**, this is accomplished by an electromagnet **227** which is adapted to shift the shaft **221**, which is secured to the second reed **220** and is in this case divided into two sections, selectively either in one or the other axial direction. Stop members **228** which also serve as bearings for the shaft sections **221** are mounted at both sides of two straps **229** which secure the second reed **220** to the shaft sections **221** and are adapted to abut against the left or right stop members **228** which thus limit the extent of the movements of the second reed in either direction. The shifting movement of the second reed **220** must occur while the sley is pivoted forwardly and located in the position as illustrated in FIG. **6** so that during the shifting movement there will be no warp wires within the slots **225**. When after the formation of the new shed those warp wires **230** which previously limited the lower side of the shed have moved to the upper side, slots **225** will be in straight alignment with these warp wires so that the latter may enter the slots **225** when the sley is pivoted back.

FIGS. **8** and **9** illustrate a loom which is provided with two rigid guide tubes **301** and **301'** which are inserted from opposite sides into the shed and are guided so that their front ends facing each other are in straight alignment within the shed so that a continuous channel for the weft wire **309** is formed. Each of the two guide tubes is longitudinally slidable within a guide bar **302** or **302'**, respectively, and provided with a drive mechanism which consists of a bell crank, a connecting rod, and a crank which is mounted on the main shaft.

Guide tube **301** of the loom according to FIGS. **8** and **9** has a considerably greater length than guide tube **301'**, and the rear end of guide tube **301** is in straight alignment with the center between two feed wheels **310** which are mounted in the same manner as the pair of feed wheels **10** in FIGS. **1** and **2**.

The pair of feed wheels **310** is driven continuously and these wheels are disengaged from the weft wire when the latter is not to be fed, that is, when the sley is pivoted forwardly for beating the weft wire against the warp wires. In order to start the next feeding operation very smoothly, the drive mechanism of the feed wheels **310** is designed so as to drive the latter slowly at the beginning of the feeding operation and thereafter to increase their speed. In the particular loom as illustrated in FIGS. **8** and **9** this is attained by providing the gearing between the main shaft and the pair of feed wheels with elliptical gears. It is, however, also possible to employ other suitable driving means for the feed wheels, for example, an antiparallelogram gearing. Because of the slow starting part of the feeding movement of the weft wire, the two guide tubes **301** and **301'** are made of such lengths that they will engage upon each other within the shed at the moment when the front end of the weft wire **309** reaches the end of the short guide tube **301'**. In this manner it is possible to insert a weft wire into a shed within the shortest possible length of time. If the weft wire has a sufficient rigidity, the retraction of the two guide tubes from the shed may start immediately after the weft wire has started to enter the long guide tube **301** since the weft wire will thereafter be moved at a high speed and must no longer be guided along its entire length within the guide tubes. The provision of two guide tubes has the additional advantage that the weft wire may remain continuously within the guide tube which is adjacent to the feed wheels and does not have to be newly inserted each time into this tube.

FIGS. **10** and **11** illustrate a modification of the loom as shown in FIGS. **8** and **9**, in which in place of the long rigid guide tube **301** a flexible guide tube **401** is provided in order to reduce the lateral space which is required by the loom. On the left side of the frame of the

loom a vertical shaft is mounted which is alternately driven in one and then in the opposite direction by means of a pinion **435** which is mounted on this shaft and meshes with a rack **436** which is connected to a crank drive which is driven by the main shaft **406.** On its upper end, this vertical shaft carries a wheel **437** the peripheral surface of which is provided with an annular groove for receiving the flexible guide tube **401.** This wheel **437** is made of a relatively large diameter so as to permit the guide tube **401** to be easily wound thereon without requiring it to be too flexible. A part of the circumference of wheel **437** is surrounded by a guide ring **438** which maintains the part of guide tube **401** which is wound upon the wheel in engagement with the latter and directs the part which is leaving the wheel so as to pass in the desired position into the shed. The remainder of the construction of this loom is substantially the same as that of the loom according to FIGS. **8** and **9.**

When the sley after beating the previously inserted weft wire has been pivoted back, wheel **437** starts to turn in a clockwise direction, as seen in FIG. **11,** so as to slide the flexible guide tube **401** into the shed. At the same time the short rigid guide tube **401'** is likewise inserted from the opposite side into the shed, but at a considerably lower speed than guide tube **401** since the weft wire **409** is moved by the pair of feed wheels **410** at first at a low speed in the direction of movement of the short guide tube **401'.** At the inside of the shed the two guide tubes are guided either in the manner as illustrated either in FIG. **4** or in FIGS. **5** to **7.** After the weft wire has passed through the entire shed, the two feed wheels **410** are disengaged from the weft wire. The two guide tubes **401** and **401'** are then again retracted from the shed and the weft wire is cut off and held in a fixed position by conventional means until it is beaten by the reed.

FIGS. **12** and **13** illustrate a further embodiment of the invention in which only a single flexible guide tube **501** is employed. The winding element for this guide tube likewise consists of a wheel **537** which, however, differs from the wheel **437** according to FIGS. **10** and **11** by being provided on its upper side with a hub **537'** which tapers in its upward direction. This hub permits the guide tube **501** to pass without buckling from the outer periphery of wheel **437** in the form of a spiral to the axis of rotation of the wheel so that the open end of tube **501** will be disposed within this axis and point in the upward direction. Into this open end the weft wire **510** is inserted from above which is drawn upwardly off a reel **550** which is mounted on the floor laterally of the loom and passes over several guide rollers one of which is mounted on the upper end of one arm of a two-armed pivotable lever **551** which by means of a spring maintains the weft wire in a tight condition. Shortly before this wire enters the guide tube **501,** it passes through a gripping device **552** which, however, grips the weft wire and stops its feeding movement only when this device is in its closed position.

The means for driving the wheel **537** are designed in the same manner as the driving means of the wheel **437** as shown in FIGS. **10** and **11** and wheel **537** is likewise surrounded by a guide ring **538** which maintains the part of guide tube **501** which is wound on wheel **537** in engagement with the latter and then guides this tube when leaving the wheel in the direction in which the weft wire is passed through the fabric. Within the shed, guide tube **501** is guided by the wall of a bore in the reed or by the wall of a groove in a second reed in the manner as illustrated in FIG. **4** or FIG. **5,** respectively.

The weft wire **509** is always passed completely through the guide tube **501** and, before the guide tube is inserted into the shed, the weft wire projects from the free end of the guide tube for a distance of about **10** to **20** mm. Before wheel **537** moves the guide tube into the shed, the gripping device **552** is closed. The weft wire is therefore moved together with guide tube **501** through the shed when wheel **537** is driven in the clockwise direction, as seen in FIG. **13.** When the guide tube reaches the right side of the fabric, the end of the weft wire which projects from the guide tube will be gripped and held in a fixed position by a second gripping device **553.** Thereupon the first gripping device is opened and wheel **537** will be turned in the opposite direction so that the guide tube will be wound back upon the wheel and a new weft wire will be passed into the guide tube. When guide tube **501** reaches its original or starting position, another gripping device **554** grips the weft wire at the left side of the fabric and a cutting device **555** cuts off the wire at a point which is spaced at a distance of about 10 to 20 mm from the end of the guide tube. Finally, the two gripping devices **553** and **554** are opened and the weft wire is beaten by the reed against the warp wires. Thereafter, this cycle of operations is repeated.

Although my invention has been illustrated and described with reference to the preferred embodiments thereof, I wish to have it understood that it is in no way limited to the details of such embodiments but is capable of numerous modifications within the scope of the appended claims.

Having thus fully disclosed my invention, what I claim is:

1. A loom for producing fabrics of wires of metal or plastic having a reed and means for inserting a weft wire into each shed formed by the warp wires, said means comprising at least one flexible guide tube for guiding said weft wire, means for moving said guide tube back and forth in its longitudinal direction and for inserting it from one side of said loom in the weft direction into said shed, said last-named means comprising winding means having a rotor for carrying said guide tube, driving means for alternately turning said rotor in one and the opposite direction for winding said guide tube on and off said rotor, and guide means surrounding at least a part of the circumference of said rotor and radially spaced therefrom at a distance substantially equal to the thickness of said guide tube for holding said guide tube on said rotor.

2. A loom as defined in claim **1,** in which said rotor and said guide means are disposed at one side of said loom, and further guide means for guiding said guide tube from said rotor in the weft direction toward and into said shed.

3. A loom as defined in claim **2,** in which said rotor forms a wheel having a hub at least on one side thereof, said wheel and said hub having a channel extending spirally from the axis of rotation of said hub through said hub to the periphery of said wheel for feeding said weft wire from the outside into the free end of said hub and through said channel and then around a part of the periphery of said wheel to said further guide means.

4. A loom as defined in claim **1,** in which said guide tube is movable from said wheel toward and into said

shed in a direction along a straight line which extends substantially tangentially to the outer peripheral surface of said rotor forming a contact surface for said guide tube.

5. A loom for producing fabrics of wires of metal or plastic having a reed and means for inserting a weft wire into each shed formed by the warp wires, said means comprising at least one flexible guide tube for guiding said weft wire, means for moving said guide tube back and forth in its longitudinal directionn and for inserting it from one side of said loom in the weft direction into said shed, said last-named means including means for forming said tube into at least a part of a coil and rotating said coil about its axis, and means for guiding the tube from said coil and extending it in a straight line in that portion thereof which is inserted into said shed.

6. A loom as defined in claim 5, wherein the tube has a wall the section of which is a complete annulus, and comprising means for introducing the weft wire into the end of the tube which is disposed on the side of said coil which is remote from the loom.

7. A loom as defined in claim 5, comprising a second guide tube for guiding said weft wire, means for moving said second guide tube back and forth in its longitudinal direction and for inserting it from the other side of said loom in the weft direction into said shed so that within said shed the ends of said guide tubes face each other and are in straight axial alignment with each other and said second guide tube is movable towards said first guide tube so that the end of the movement of said guide tubes toward each other the end of said second tube is spaced no more than a short distance from the end of said first guide tube.

8. A loom as defined in claim 5, in which one of said two guide tubes is movable through a greater distance than the other into said shed.

9. A loom as defined in claim 8, in which said second guide tube through which the weft wire is passed into the first guide tube is movable for a shorter distance into said shed than said second guide tube.

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