Jan. 3, 1950 V. WERNER ET AL 2,493,515

CONTINUOUS PATH GRIPPER SHUTTLE LOOM

Filed Sept. 20, 1947

4 Sheets-Sheet 1

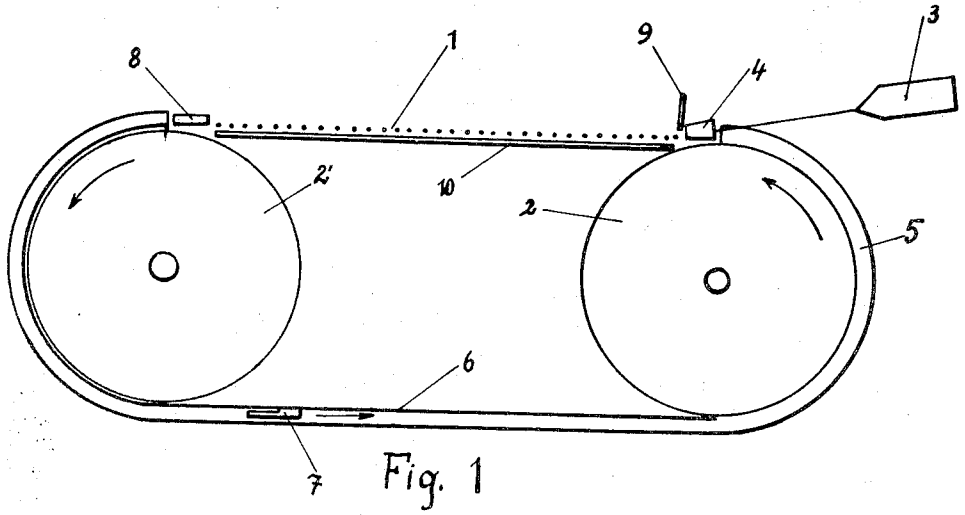


Fig. 1

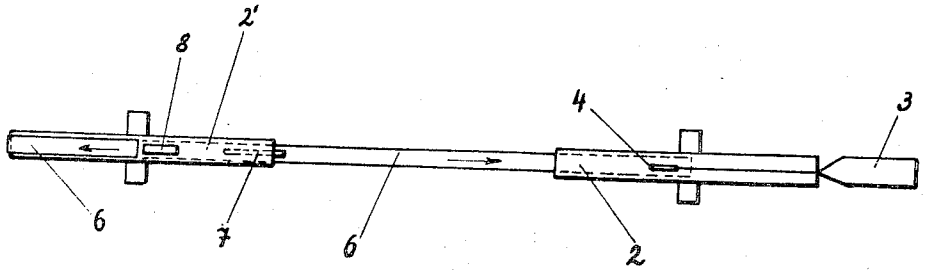


Fig. 2

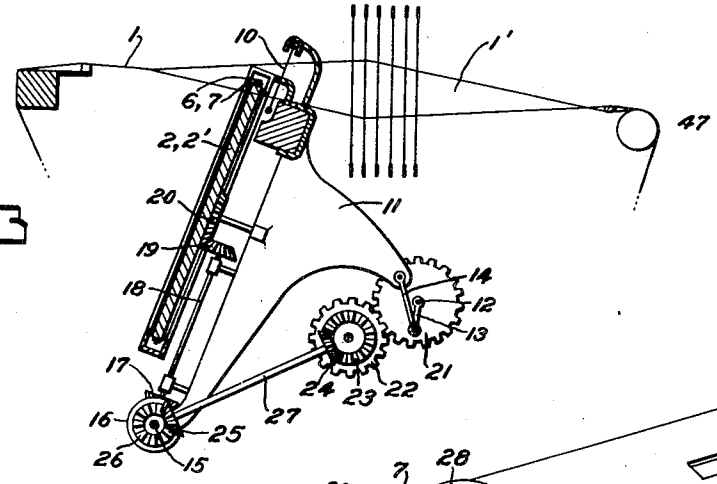
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Fig. 3



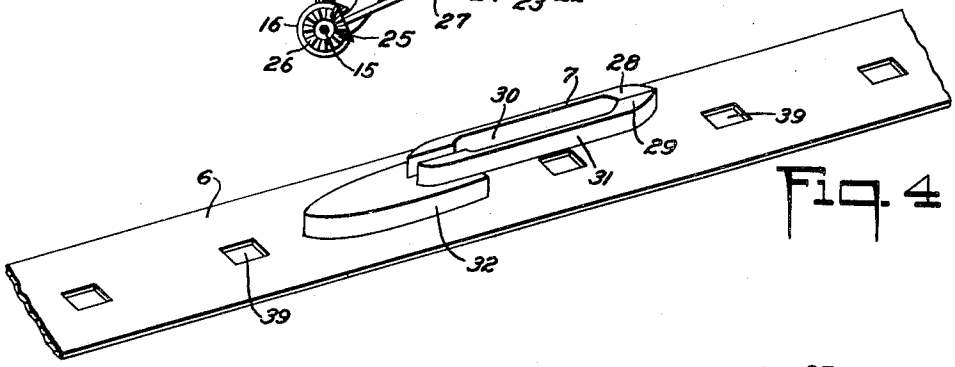


Fig. 4

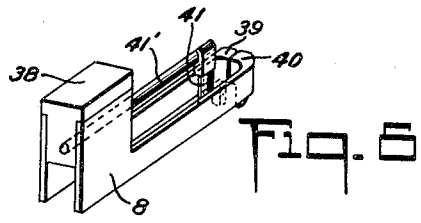


Fig. 6

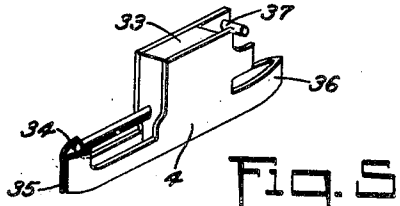


Fig. 5

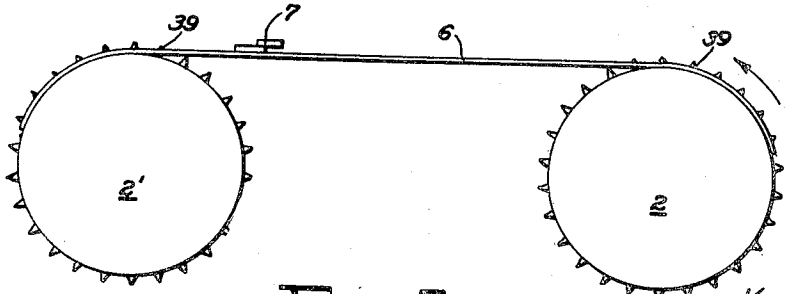


Fig. 7

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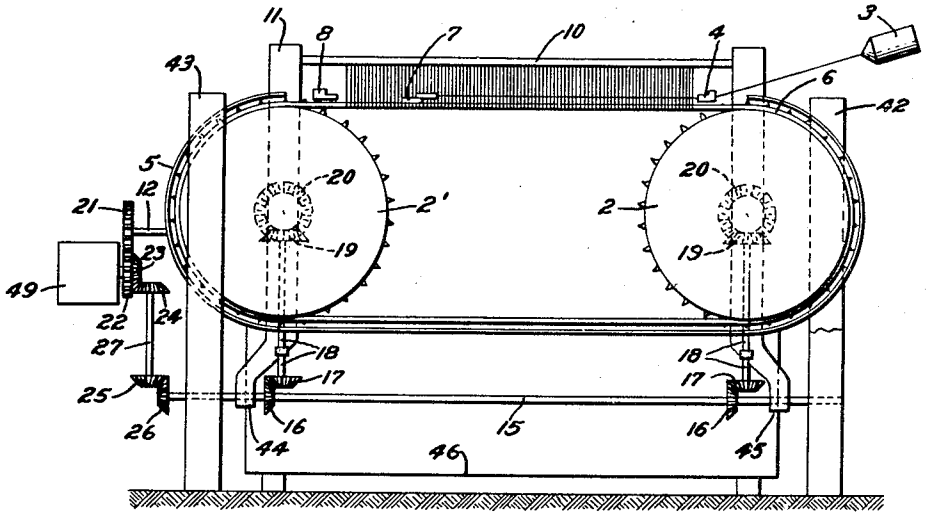


Fig. 2

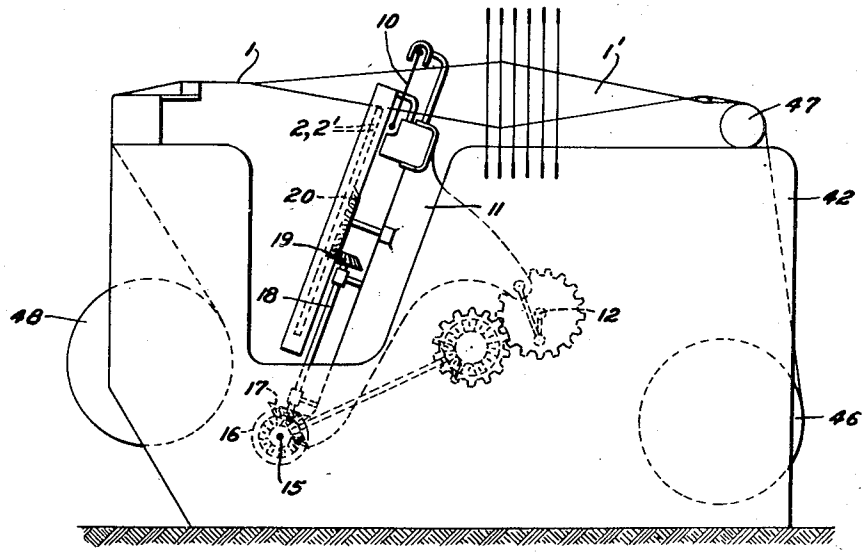


Fig. 3

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CONTINUOUS PATH GRIPPER SHUTTLE LOOM

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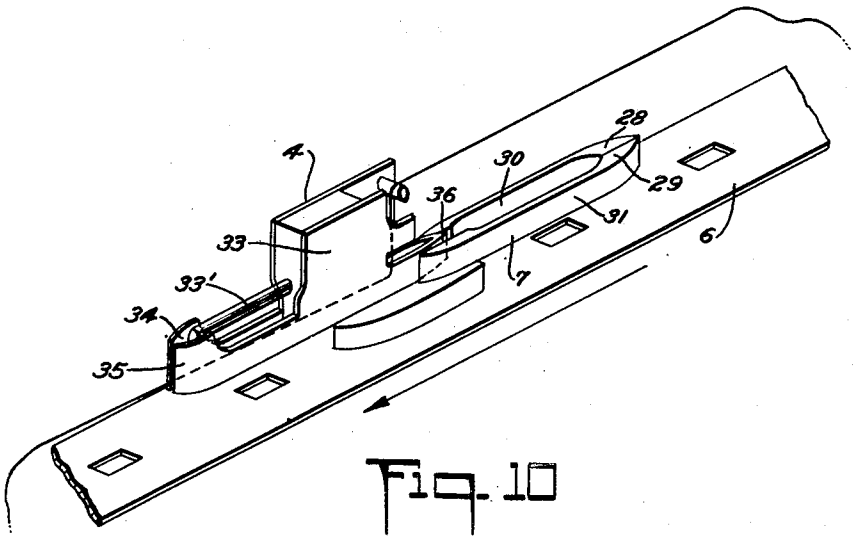


Fig. 10

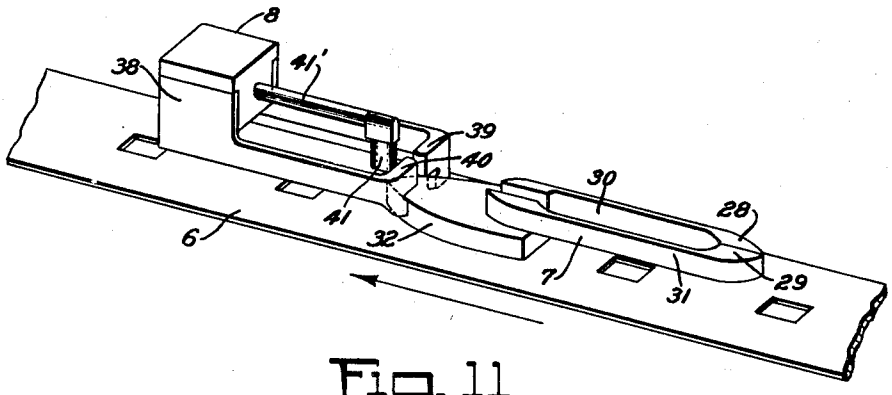


Fig. 11

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CONTINUOUS PATH GRIPPER SHUTTLE LOOM

Vilém Werner, Pizen, and Karel Kubelka, Blansko, Czechoslovakia, assignors of one-third to Zbrojovka Brno, Narodni Podnik, also named Brno Arms Factory, National Corporation, Prague, Czechoslovakia, a corporation of Czechoslovakia

Application September 20, 1947, Serial No. 775,210
In Czechoslovakia September 20, 1946

4 Claims. (Cl. 139—126)

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In the known automatic weaving looms the weft bobbin is mounted in a shuttle which travels in a reciprocating movement through the shed formed by the decussation of the warp. Such mounting of the weft bobbin in the shuttle necessitates a quite complicated construction which increases the cost price and complicates the manipulation of the loom. To achieve a continuous and quick weaving it would be advisable to use large sized shuttles capable to accommodate therein a bobbin with large weft supply. This, however, cannot be done in view of the limited dimensions of the shed and in view of the limited resistance and elasticity of the warp. In addition thereto difficulties would arise resulting from the reciprocating movement of the enlarged and overcharged shuttle and from the arising accelerations and retardations of the moving masses.

The object of our invention is to avoid the said and other disadvantages resulting from the use of shuttles performing a reciprocating movement. For this purpose we use according to our invention a stationary weft bobbin situated outside the weaving implement (shuttle) for passing the thread through the shed so that said weft bobbin does not participate in the forth and back movement of said weaving implement, the weft thread being introduced into the shed with the help of a driver moving in one direction only. This driver may have a very simple and compact shape and the weft bobbin arranged outside said driver may be of any desired size and capacity. Even the usual large warp bobbins may be used for this purpose thus avoiding any cops. The resulting driving conditions are much more propitious in view of the easy and smooth movement of the said weaving implement which travels through the shed in one direction only as stated above. The arrangement is therefore always dynamically balanced and runs quietly.

The novel features which we consider characteristic of our invention are set forth with particularity in the appended claims. The invention itself however and additional objects and advantages thereof will best be understood from the following description of an embodiment thereof when read in connection with the accompanying drawing in which

Fig. 1 shows a front view of our new weaving mechanism that may be used in combination with any known automatic weaving loom, and

Fig. 2 is a top view thereof;

Fig. 3 is a vertical cross section showing the

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open shed, the sley and the driving means for the same and for the proper weaving implement according to our invention;

Fig. 4 shows in perspective view the catcher referred to in the specification;

Fig. 5 is a perspective view of the feeder referred to in the specification;

Fig. 6 is a perspective view of the receiving or seizing device referred to in the specification;

Fig. 7 shows in part a scheme for the driving mechanism for the catcher;

Figs. 8 and 9 show in front view and in side view respectively a weaving loom comprising our new weaving implement;

Fig. 10 shows in perspective view the catcher and the feeder in cooperating position, and

Fig. 11 shows in perspective view the catcher and the receiving or seizing device in cooperating position.

The same numerals designate the same parts in all figures.

In the following general description we refer at first mainly to Figs. 1, 2, 3, 7, 8 and 9.

The warp 1 is arranged above and between two driving wheels 2 and 2' which may be friction wheels or toothed wheels or the like and whose axles are approximately distanced from each other by the width of the warp 1. The weft bobbin 3 which may have any desirable shape and size is mounted in a lateral stationary position advantageously on some fixed part of the loom. Above the wheel 2 is a stationary feeder 4 through which the thread coming from the weft bobbin 3 passes and which holds the end of the weft thread in a position ready to be seized and carried through the shed.

The proper weaving implement effecting the driving of the thread through the shed formed by the known decussation of the warp 1 comprises a flexible belt, band or the like 6 made for example from flexible sheet steel which is not longer than the distance between the axles of the wheels 2, 2' plus the circumference of one of these wheels as appearing especially from Figs. 1, 7, and 8. This limitation of the length of the belt 6 appears necessary to bring said belt out of contact with the reed 10 after the weft thread has been introduced into the shed 1'. The said belt 6 or the like is seized by the constantly rotating wheels 2, 2' and carried by them continuously around in an endless path in the direction of the shown arrows. During this movement the said belt 6 is held and guided by the C-shaped guide

rail or the like 5 which surrounds the outer half of the circumferences of the wheels 2, 2' and supports the belt while it is moving from wheel 2' to wheel 2.

On the said belt 6 is a catcher 7 mounted which while passing the stationary feeder 4 catches the protruding end of the weft thread coming from the bobbin 3 and carries the same through the shed formed by the warp 1 to the receiving or seizing device 8 which captures and seizes the incoming end of the weft thread freeing the same from the catcher 7. As soon as the continuously moving belt 6 emerges completely from the shed the reed 10 comes into action settling the weft thread in place, the knife or other cutting implement 9 cuts the weft thread near the feeder 4 and the stationary receiving or seizing device 8 releases the other end of said thread. The actuation of the knife or cutting implement 9 and the thread release from the receiving or seizing device 8 may be initiated by the described movement of the reed 10 or in any other proper manner.

Thereafter a new shed is formed in the warp 1 in any of the many known manners and the operation described above is repeated continuously.

Referring to Fig. 3 it appears that the sley 11 oscillates about the shaft 15 and is driven from the main shaft 12 by the crank mechanism 13, 14. The driving mechanism for the belt or band 6 comprises the wheels 2, 2', the pair of bevel wheels 19, 20, the shaft 18 and the bevel wheel pair 17 and 16, the latter being mounted upon the shaft 15. This shaft is driven by the bevel wheel pair 25, 26, the shaft 27, the bevel wheel pair 24, 23 and the toothed gear 22, 21 the latter being mounted upon the main shaft 12.

The catcher 7 shown in enlarged scale in Figs. 4, 10 and 11 is mounted on the belt 6 which contains in regular distances openings or the like 39 engaging with the teeth of the wheels 2, 2' as shown in Fig. 7. The catcher comprises two elastic pincer arms 30, 31 which end into grasping jaws 28, 29 and which are attached to the wedge shaped support 32 connected to the belt 6.

The feeder 4 shown in enlarged scale in Figs. 5 and 10 comprises the central body 33 which is adapted to guide the weft yarn coming over the peg 37. The central body 33 supports the elastic pincers 34, 35 which hold the protruding end of the weft yarn, and the opposite side of said central body passes into the wedge 36. A wedgelike member 33' is attached to the central body 33 and extends between the pincers 34, 35 preventing their too strong clamping.

The receiving device 8 illustrated in enlarged scale in Figs. 6 and 11 comprises the central body 38 which supports elastically mounted grasping jaws 39, 40 having in their lower part an opening as appearing in dotted lines in Fig. 6, and in Fig. 11. In the space between the elastic jaw arms is an opening device situated which consists of an edged head piece 41 supported by a pin 41' mounted in the body 38.

The weaving loom illustrated in Figs. 8 and 9 shows the supports 42, 43 with the main shaft 12 and the shaft 15 as described above. This shaft 15 supports the sley 11 resting on the bearings 44, 45. The warp is wound upon the beam 46, and passes over the roller 47 to the cloth-beam 48. The main shaft 12 is driven by the electric motor 49.

The cooperation of the catcher 7 with the feeder 4 and of the catcher 7 with the receiving or seizing device 8 is apparent from Figs. 10 and 11 respectively.

The catcher 7 on its circulating path before entering the shed 1' comes into contact with the wedged end 36 of the feeder 4 which enters between the elastic pincer arms 30, 31 of the catcher 7 and opens the same. The grasping jaws 28, 29 slide in open position along the sides of the feeder 4 until they pass the jaws 34, 35 out of which protrudes the end of the weft yarn which is seized by the closing jaws 28, 29 and carried through the shed (Fig. 3). When leaving the shed the catcher 7 enters into cooperation with the seizing device 8 which is situated at the other end of the shed 1' as shown in Fig. 8. The wedge-shaped support 32 enters into the openings arranged in the lower part of the jaws 39, 40 and opens these jaws to permit the passage of the pincer arms 30, 31 through the openings between the jaws 39, 40. Immediately thereafter the pincer jaws 39, 40 seize the weft yarn still carried by the jaws 28, 29 while the edged head piece 41 enters between the jaws 28, 29 and releases the weft yarn end therefrom.

While we have shown and described a specific embodiment of our invention, it will be apparent to those skilled in the art that various changes, modifications, substitutions, additions and omissions may be made therein without departing from the spirit and scope of our invention as set forth in the appended claims.

What we claim as our invention is:

1. In an automatic weaving loom the combination comprising a pair of rotating driving wheels having parallel axles distanced from each other by about the width of the warp, a flexible belt continuously driven by and around said wheels and through the shed in one direction in an endless path, the free ends of the said belt being apart for at least the width of the warp, a thread catcher attached to said belt, a stationary weft bobbin arranged outside the path of said belt, a feeder situated on one side of the warp supporting the end of the weft thread and cooperating with the moving catcher, a seizing device situated on the other side of the warp, said seizing device freeing the pulled end of the weft thread from the catcher, and a thread cutting device close behind the feeder.

2. In an automatic weaving loom the combination comprising a reed, a stationary mounted weft bobbin, a driver moving continuously in an endless path leading through the shed, a thread catcher attached to said driver, a stationary thread feeder in front of the shed in the direction of the driver movement, said thread feeder holding the free end of the weft thread and cooperating with said catcher, a stationary seizing device behind the shed with means to free the thread end from said catcher and to release the same before the action of the reed.

3. In an automatic weaving loom the combination comprising a reed, a stationary mounted weft bobbin, a driver moving continuously in an endless path leading through the shed, a thread catcher attached to said driver, a stationary thread feeder in front of the shed in the direction of the driver movement, said thread feeder holding the free end of the weft thread and cooperating with said catcher, a stationary seizing device behind the shed with means to free the thread end from said catcher and to release the same before the action of the reed, and a thread cutting device near said feeder.

4. In an automatic weaving loom of the type described the combination comprising a stationary mounted weft bobbin and a thread driver formed by an elastic band or belt, a pair of driving wheels for said band or belt moving the latter in an endless path continuously in one direction through the shed, the axle distance of the said driving wheels being about equal to the width of the warp, and the free ends of said belt or band being distanced from each other at least by the width of the warp.

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