May 31, 1960 R. STÖCK 2,938,259

LEASING DEVICE

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Fig. 1

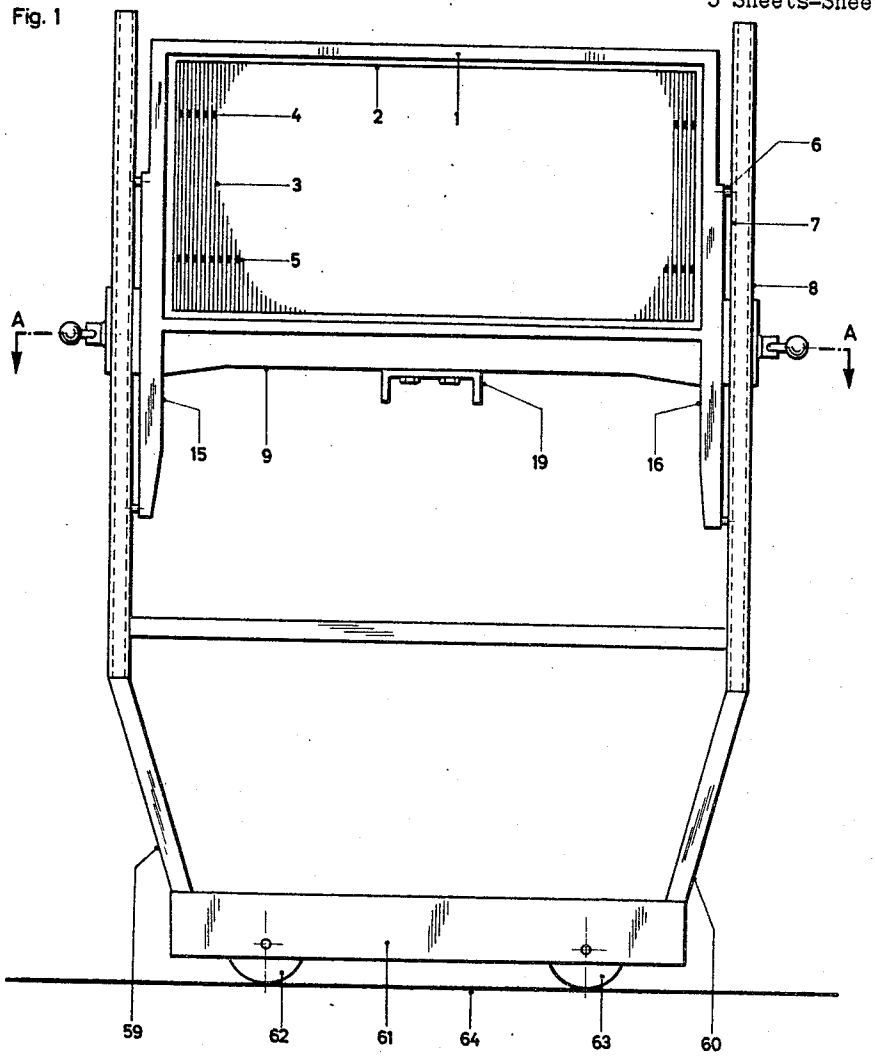
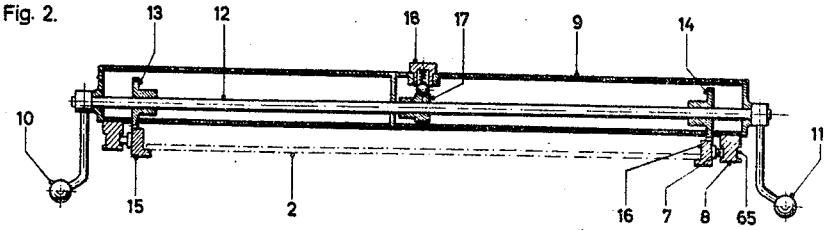


Fig. 2.



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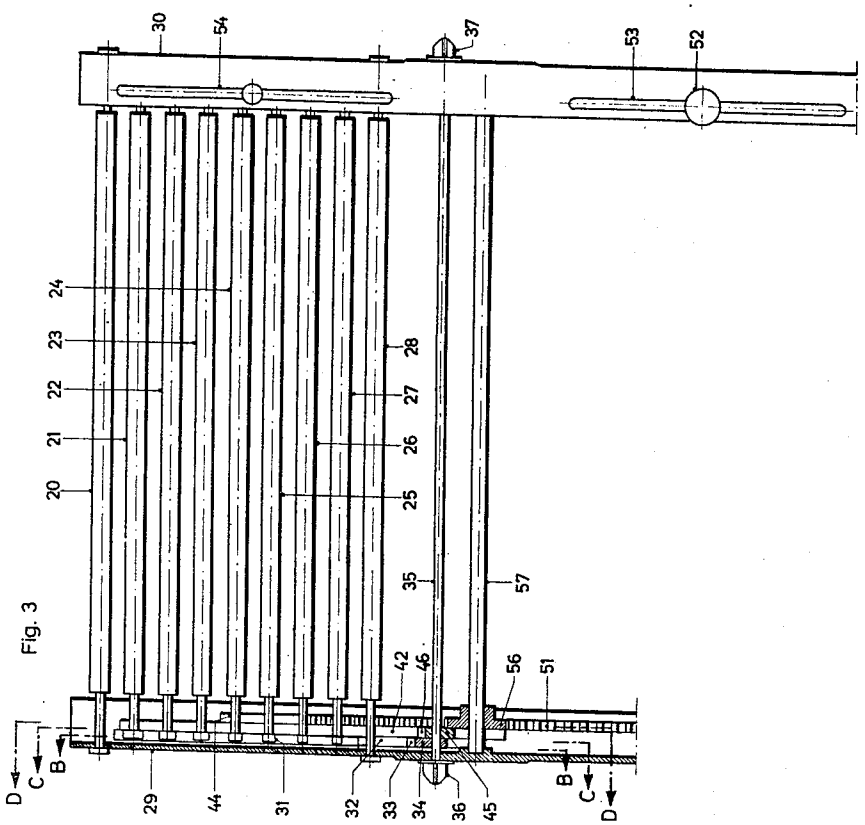


Fig. 3

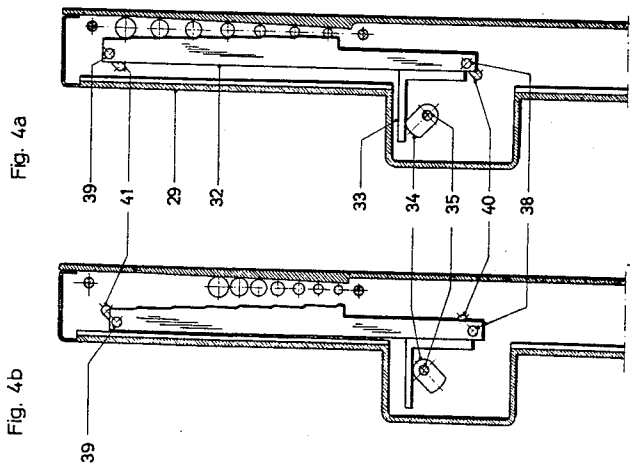


Fig. 4a

Fig. 4b

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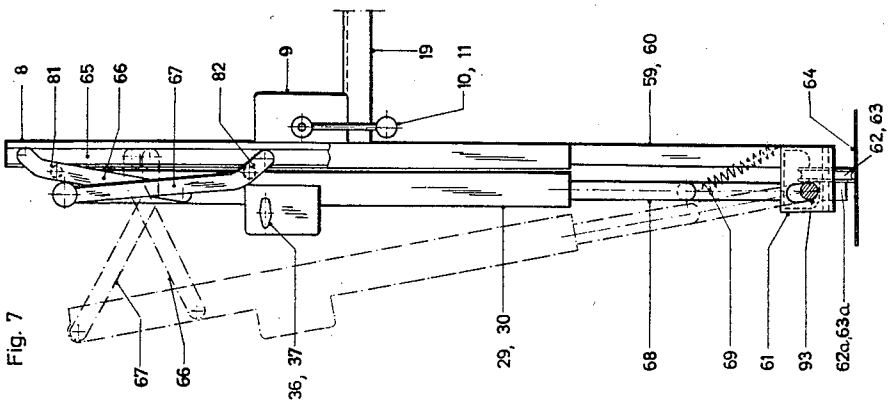


Fig. 7

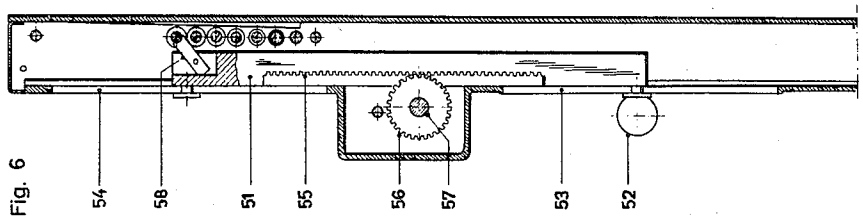


Fig. 6

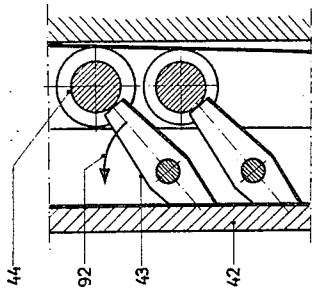


Fig. 5b

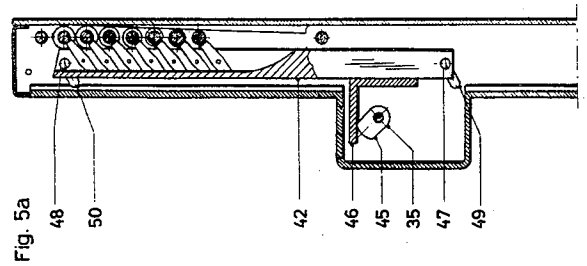


Fig. 5a

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Fig. 8a

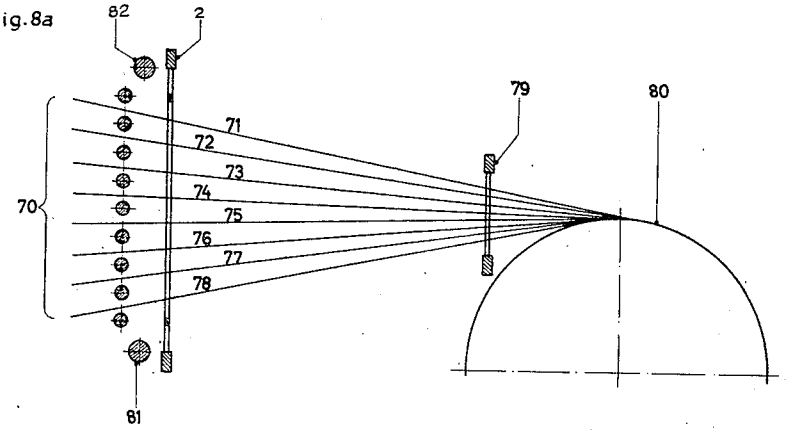


Fig. 8b

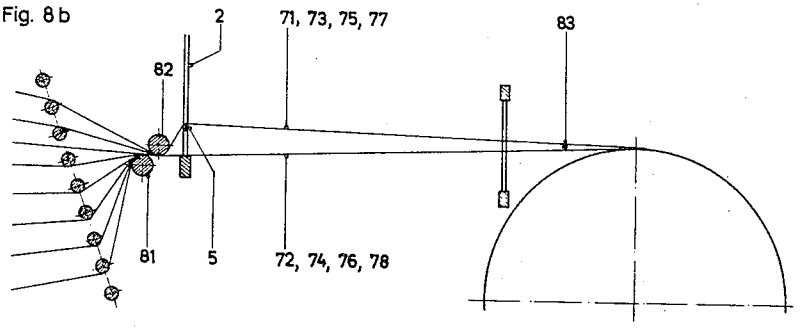
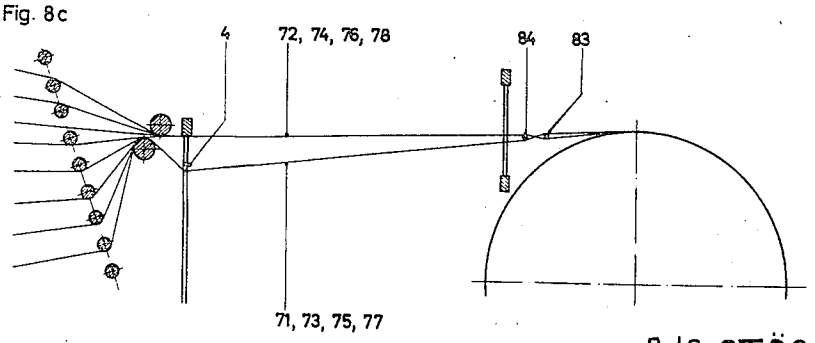


Fig. 8c



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Fig. 9a

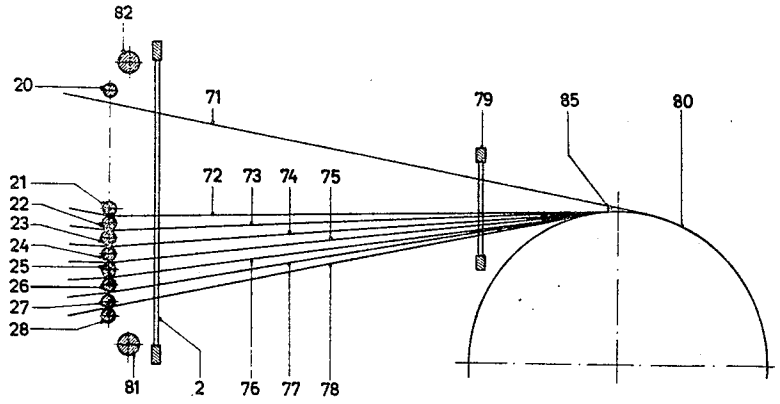


Fig. 9b

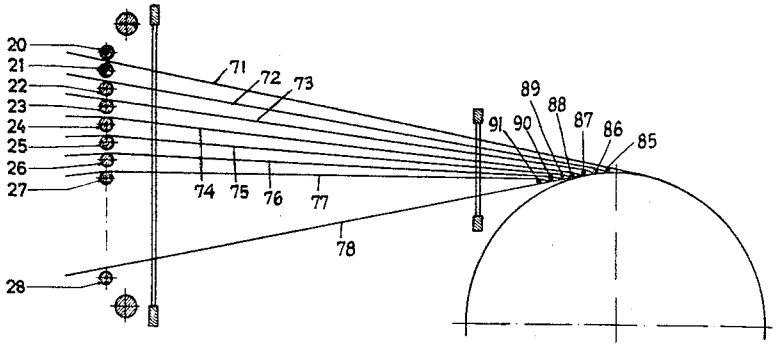
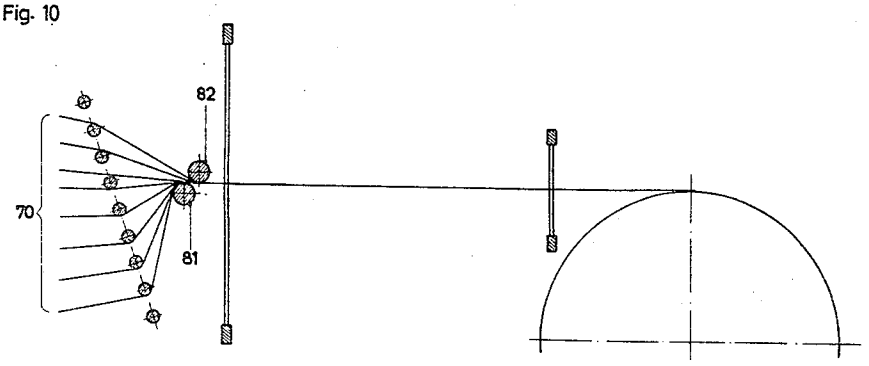


Fig. 10



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LEASING DEVICE

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Filed Nov. 17, 1958, Ser. No. 774,402

Claims priority, application Switzerland Nov. 23, 1957

9 Claims. (Cl. 28—40)

The present invention relates to a leasing device for warping machines having a split rod frame for the split rods and a support for the lease reed.

The device according to the invention is characterized by the fact that the split rod frame is mounted on the lease reed support and in that the split rods are arranged immediately in front of the lease reed.

Thereby the split rod frame may be hinged to the reed support so that it may be swung away from the lease reed to thereby displace a pair of guiding rolls in such a way towards each other that all ends passing through the lease reed are brought into one level or plane. In this position broken ends may readily be found and new ends drawn in. This position moreover forms the starting position for the so-called "1:1 end lease." To this end the lease reed may be displaced with respect to the split rod frame in a plane parallel to the plane of the split rod frame and in the direction in which the teeth of the lease reed extend in order to divide in the usual manner the ends lying in one plane into two layers.

Preferably the split rods are arranged in the split rod frame so that they can be lowered in common and lifted separately. For the multiple lease the distance separating two successive split rods may be enlarged, the thus formed larger interspace permitting an easy drawing-in of cords between two end layers. Thereafter the split rods may be brought back into their starting position in which the successive split rods are equally spaced.

There may be means provided for imparting to the split rod frame during normal operation a constant oscillating movement in a plane parallel to the lease reed. Thereby it is prevented that the ends coming from the creel always pass the lease reed at the same point which may lead to local wear of the reed.

Other features and advantages of the invention will become apparent from the description now to follow, of a preferred embodiment thereof, given by way of example only and in which reference will be made to the accompanying drawings, in which:

Figure 1 is a view of the lease reed support as seen from the creel.

Figure 2 is a cross-section taken along the line A—A in Figure 1.

Figure 3 is a view of the split rod frame with the split rods as seen from the creel.

Figure 4*a* is a section through the fixing bar taken along the line B—B in Figure 3.

Figure 4*b* is a section through the fixing bar of Figure 4*a*, with the split rods in lowered position.

Figure 5*a* is a section through the latch bar, taken along the line C—C in Figure 3.

Figure 5*b* is an enlarged view of a portion of the latch bar.

Figure 6 is a section through the lift bar, taken along the line D—D in Figure 3.

Figure 7 is a side view of the leasing device.

Figure 8*a* shows diagrammatically a side elevation view of the arrangement of the ends during normal warping.

Figure 8*b* shows, again diagrammatically a side elevation view, similar to Figure 8*a*, of the position of the ends during the "1:1 end lease" for the first lease.

Figure 8*c* shows, again diagrammatically, a side elevation view, similar to Figs. 8*a* and 8*b*, of the position of the ends during the "1:1 end lease" for the second lease.

Figure 9*a* shows diagrammatically a side elevation view of the position of the ends during the "multiple lease" for the first layer.

Figure 9*b* is a view similar to that of Figure 9*a* but for the last layer, and

Figure 10 shows diagrammatically a side elevation view of the position of the ends for the drawing-in of broken ends.

Referring to Figure 1 reference numeral **1** designates a support carrying a lease reed **2**, the teeth **3** of which having upper and lower abutments **4**, **5** respectively. These abutments **4** and **5** in the interstices between the teeth **3** permit separation of the passing ends into corresponding layers. Guiding pins **6** project laterally the support **1** for slidably guiding the latter in grooves **7** of a pair of guide bars **8**. A traverse or cross bar **9** connects the two guide bars **8**. The vertical displacement of support **1** on the pins **6** in the grooves **7** of the guide bars **8** is effected by cranks **10** and **11**, positioned on both ends of the traverse **9** as is visible from Figure 2, and through a shaft **12** and toothed wheels **13** and **14**, and racks **15** and **16** on support **1**. A locking disc **17** mounted on shaft **12** is engageable with a ball lock device **18** to secure the support **1** in any desired position. By means of the traverse **9** the leasing device is also connected with the warping slide **19** of a warping machine (not shown) and simultaneously it is supported by a pair of braces **59** and **60** on a carriage **61** displaceable on rolls **62** and **63** on the floor **64** immediately in front of the warping machine and parallelly to the longitudinal axis of the latter.

Figure 3 shows the actual leasing device and more particularly the mounting of the split rods **20—28** guided in a pair of side bars **29** and **30** having U-shaped cross sections and, as is visible from Figure 4*a*, held in their relative position. To this end the outer tap diameter **31** of the split rods **21–27** increases from the lowermost split rod to the uppermost split rod so that these rods are maintained equally spaced from each other by a stepped fixing bar **32**. A projection **33** formed on the fixing bar **32** bears on a cam **34**, which may be operated through a shaft **35** from handles **36** and **37** arranged at both sides of the apparatus. If, as seen in Figure 4*a*, the cam **34** is rotated in a counterclockwise direction, the fixing bar **32** is lowered and displaced laterally by the action of bolts **38**, **39** of this bar guided in slots **40** and **41** respectively of the side bars **29** and **30**, respectively. As a result of this movement of the fixing bar, the split rods **21–27**, which are no longer supported on the steps of this fixing bar, fall downwardly and gather on the lowermost split rod **28**. This position is shown in Figure 4*b*. It should be noted here that the outermost split rods **20** and **28** are fixed in position as they are rigidly mounted in the side bars **29**, **30**.

As is visible from Figure 3 there is positioned laterally of the fixing bar **32** a latch bar **42** by means of which the movable split rods **21–27** may be held in an upper gathered position. The means provided to this end are visible in Figure 5*b*. In the latch bar **42** pawls **43** are arranged in such manner that they may be pivoted in the direction of arrow **92** but due to their asymmetric

suspension they always tend to return into their base position. By the pawls **43** the movable split rods **21–27** each having a pawl associated therewith may be held at the taps **44** which at these points are of equal diameter for all split rods. For moving the split rods **21–27** from their upper, gathered arrangement into the arrangement shown in Figure 4*a*, a cam **45** also mounted on shaft **35** is rotated by handles **36** and **37** so that a projection **46** on the latch bar **42** can be lowered. As is the fixing bar **32**, the latch bar **42** is also guided by bolts **47** and **48** secured to it and guided in slots **49** and **50** of the side bars **29** and **30** respectively, so that the latch bar effects a lateral movement resulting in the liberation of the movable split rods **21–27** from the pawls **43** so that the split rods may fall back into the arrangement according to Figure 4*a*. Both cams **34** and **45** mounted on shaft **35** and serving to actuate the fixing bar **32** and the latch bar **42**, respectively, are staggered with respect to each other so that upon lowering of the latch bar **42** the fixing bar **32** is already back in position to receive the split rods according to Figure 4*a*.

In order to bring the movable split rods **21–27** into the upper gathered arrangement according to Figure 5*a*, a lift bar **51** (Figure 3) is arranged laterally of the latch bar **42**. As shown in Figure 6 this lift bar **51** may be lifted by a ball handle **52** in slots **53** and **54**. This movement is transmitted to a lift bar (not shown) in the side bar **30** by a rack **55**, a gear **56** and a shaft **57**. The split rods **21–27** are thereby separately engaged by a latch **58** at the taps **44**, lifted and thereafter held in this lifted position by the pawl **43** (Figure 5*b*) associated with each split rod.

Figure 7 shows in a side view the assembling of the lease reed support (Figure 1) and of the split rod frame (Figure 3). In the guide rods **8** (Figure 2) there is formed a groove **65** opposite the groove **7**. Two hinge levers **66** and **67** are guided in this groove **65** and are pivotally mounted in the side bars **29** and **30**. Moreover the side bars **29** and **30** are pivotally mounted a distance in front of the lease reed braces **59** and **60** which is only a fraction of the thickness of side bars **29** and **30** as at **93** on the carriage **61** by hinge supports **68**. A pull spring **69** draws the whole split rod frame continuously against the lease reed support. By tilting about the pivotal point **93** on the carriage it is possible to pivot the split rod frame against the action of spring **69** from its position shown in full lines into the position shown in dot-and-dash lines. Thereby the two hinge levers **66** and **67** guided in the grooves **65** of the guide rods **8** are pivoted towards each other in a scissor-like movement. Guide rods **81**, **82** are mounted on the hinge levers **66** and **67**, respectively and these guide rods approach each other upon the mentioned movement of the hinge levers, that is when the split rod frame is pivoted outwardly as will be explained more in detail with reference to the Figures 8*a*–8*c*. According to Figure 8*a* the ends **70** are divided by a creel (not shown) into a number of end layers **71–78** corresponding to the number of stages of the creel, passed through the lease reed **2** and through the guide reed, secured to the warping cylinder **80** and wound up.

In order to form the so called "1:1 end lease" the described and illustrated device operates as follows: The split rod frame is pivoted away from the reed holder into the position shown in dot-and-dash lines in Figure 7. The relative movement of the guide rods **81** and **82** thereby produced brings the ends **70** on one level. If hereafter the lease reed **2** is upwardly displaced by actuation of the cranks **10** or **11** (Figure 2), the ends **71, 73, 75** and **77** are divided by the abutments **5** and the ends **72, 74, 76, 78** by the frame of the lease reed **2** into two layers between which the first lease cord **83** may be inserted in a known manner (Figure 8*b*). Now the lease reed **2** is moved downwardly completely by means of the cranks **10** or **11** and the same operation is repeated but with inverted ends **71, 73, 75, 77** and **72, 74, 76, 78** respectively (Figure 8*c*). After inserting the second lease cord **84** the lease reed **2** is brought back into its starting position (Figure 8*a*) which simultaneously brings the guide rods **81, 82** again out of the end fields into the position shown in Figure 8*a*. Herewith the "1:1 end lease" is terminated.

For the "multiple lease," in which the ends **70**, for example for the dressing, must be divided into several layers the operator first rotates one of the handles **36** or **37** (Figure 3) so that the split rods **21–27** are lowered as shown in Figure 4*b* which results in the production of a larger space between the end layer **71** and the end layer **72** (Figure 9*a*). This larger space makes the insertion of the first lease or split cord **85** easy. Thereafter the split rod **21** (Figure 6) is raised by means of the lift bar **51** and the pawl **58** so that a larger space is now formed between the end layers **72** and **73**, this second space permitting drawing-in of the second cord **86**. This is repeated until all split rods **21–27** are in the upper gathered arrangement and all cords **87–91** have been drawn-in. By further rotation of the handle **36** or **37** the latch bar **42** is displaced in the slots **49, 50** as described with reference to Figure 5*a* so that the split rods **21–27** fall back into their starting position shown in Figure 8*a*. The multiple lease is herewith terminated.

If an end breakage occurs during normal warping the split rod frame is swung away from the lease reed support as shown in Figure 10 into the position shown in dot-and-dash line in Figure 7. Thereby the two guide rods **81** and **82** bring all ends on one level and in this arrangement of the ends the point at which the new end must be drawn-in may be readily identified.

Preferably the split rods are removably arranged in the split rod frame. This facilitates the new drawing-in of the end field and also makes it possible to position the lease reed and the guide reed on the creel with the ends drawn-in.

In order to avoid the situation in which, during the normal warping the ends always pass the lease reed at the same point, a movement may be imparted to the split rod frame parallel to the lease reed and perpendicular to the direction of the ends passing through the lease reed, for example by means of cams **62***a* and **63***a* driven by rollers **62, 63** and producing, during movement of the chariot **61** in front of the warping machine, an oscillating movement of the split rod frame with respect to the lease reed in that the cams act upon the displaceable pivot **93** of the split rod frame.

I claim

1. A leasing device for warping machines, comprising a split rod frame having a plurality of movable split rods mounted in parallel therein, a lease reed and a support on which said lease reed is mounted, hinge means hingeably connecting the split rod frame to the lease reed support in a position in which said split rods are positioned immediately in front of the lease reed, and a pair of guiding rods being provided which, upon such swinging movement, are adapted to bring all ends passing through the split rods and through the lease reed on to one level.

2. A leasing device for warping machines, comprising a number of parallel split rods, a split rod frame in which said split rods are mounted, a lease reed and a support on which said lease reed is mounted, said split rod frame being mounted on the lease reed support and the split rods being immediately in front of the lease reed, means being provided for parallelly displacing the lease reed with respect to the split rod holder for dividing the ends lying in one level into two layers for the 1:1 end lease.

3. A leasing device for warping machines, comprising a number of parallel split rods, a split rod frame in which said rods are mounted, a lease reed and a support on which said lease reed is mounted, said split rod frame

being mounted on the lease reed support and the split rods being immediately in front of the lease reed, at least some of the split rods being slidably mounted in the frame so that they may be lowered together and lifted individually for succesively enlarging the space between two successive split rods for the multiple lease, and means on said split rod frame for afterwards returning the split rods to a position in which they are equally spaced.

4. A leasing device as claimed in claim 3, in which the split rods are removably mounted in the split rod frame.

5. A leasing device for warping machines, comprising a split rod frame having a plurality of movable split rods mounted in parallel therein, a lease reed and a support on which said lease reed is mounted, hinged means hingeably connecting the split rod frame to the lease reed support in a position in which said split rods are positioned immediately in front of the lease reed, and a pair of guiding rods on said leasing device movable parallel to said leasing reed and perpendicular to the direction in which said split rods extend, said guiding rods being moved toward each other during the swinging movement of said split rod frame for bringing all of the ends passing through the split rods and through the lease reed onto one level.

6. A leasing device as claimed in claim 5 in which said pair of guiding rods is mounted on said hinged means.

7. A leasing device for warping machines, comprising a split rod frame having a plurality of split rods mounted in parallel therein, a lease reed and a support on which said lease reed is mounted, said split rod frame being mounted on said support a distance in front of said lease reed which is only a fraction of the thickness of said split rod frame.

8. A leasing device for warping machines as claimed in claim 7 further comprising means for imparting continuous oscillatory movement to the split rod frame in a plane parallel to the lease reed during normal operation.

9. A leasing device for warping machines, comprising a split rod frame having a plurality of split rods mounted in parallel therein, a lease reed and a support on which said lease reed is mounted, said split rod frame being mounted on said support a distance in front of said lease reed which is only a fraction of the thickness of said split rod frame, a pair of guiding rods on said leasing device movable parallel to said leasing reed and perpendicular to the direction in which said split rods extend and which are moved toward each other during the swinging movement of said split rod frame for bringing all of the ends passing through said split rods and through said lease reed onto one level, and means for displacing said lease reed in the plane of said lease reed and perpendicular to the direction in which said split rods extend, said split rods being slidably mounted in said split rod frame so that they may be lowered together and lifted individually for successively enlarging the space between two successive split rods, and means on said split rod frame for returning the split rods to a position in which they are equally spaced.

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