May 3, 1938. T. F. SUGGS 2,116,179

LEASING MECHANISM FOR WARPING MACHINES

Filed March 17, 1936 4 Sheets-Sheet 1

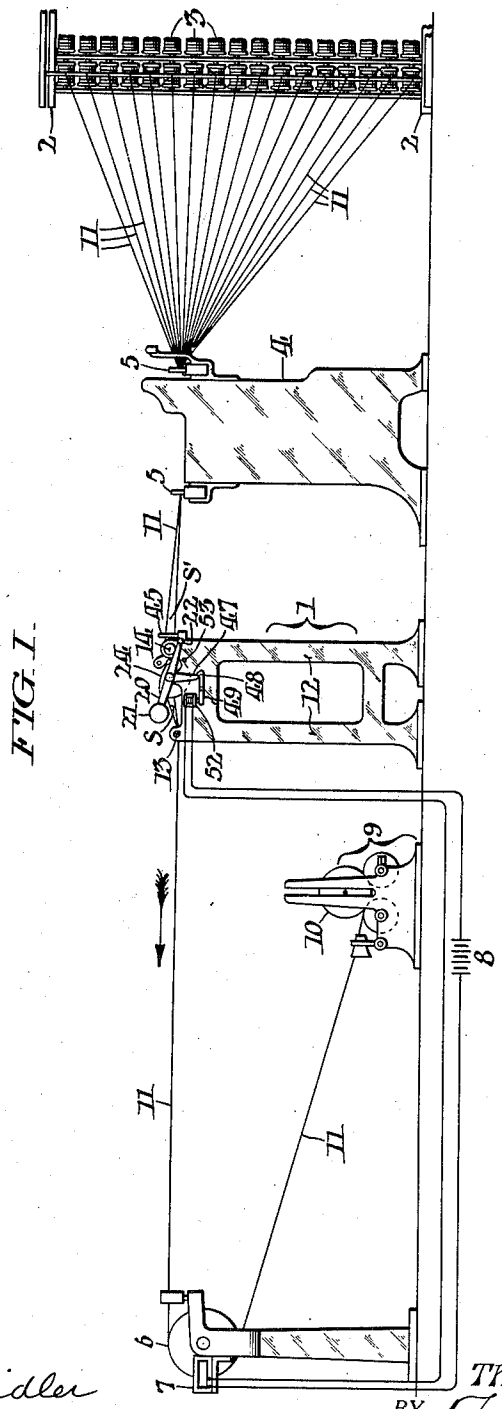


FIG. 1.

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FIG. II.

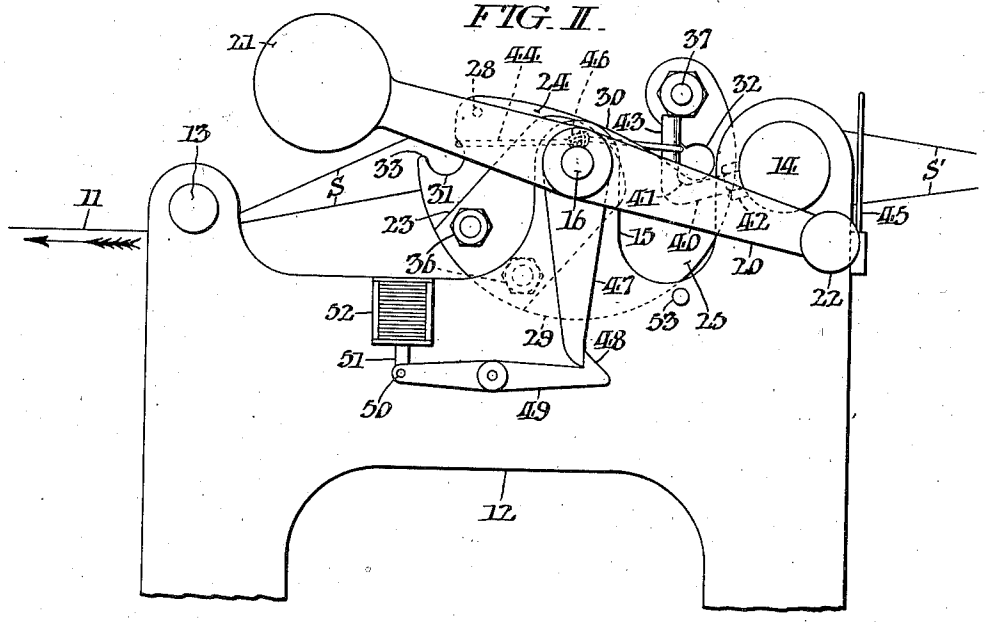
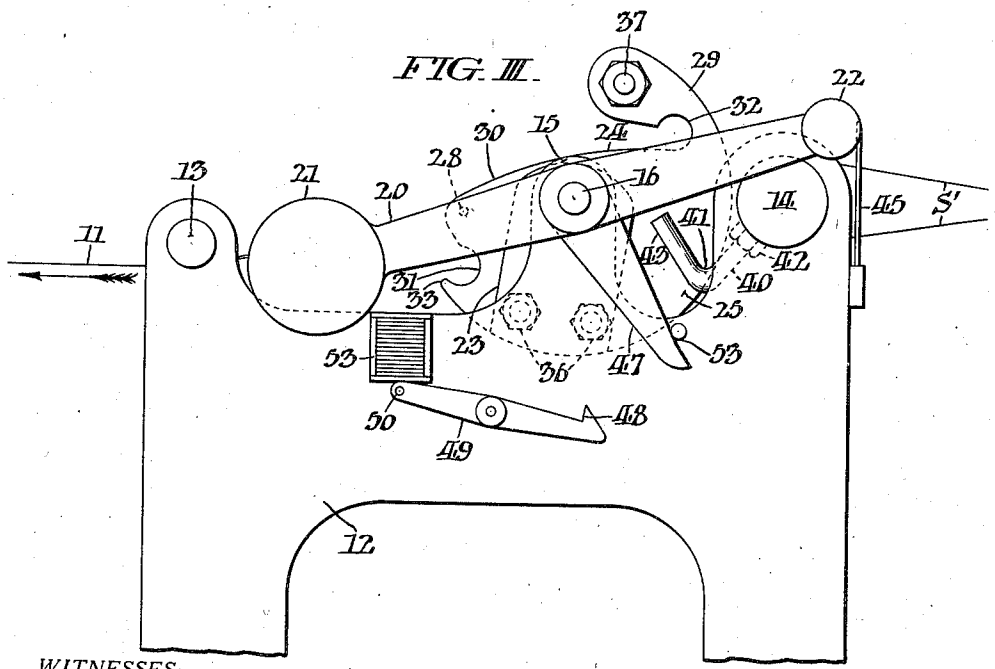


FIG. III.



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LEASING MECHANISM FOR WARPING MACHINES

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FIG. IV.

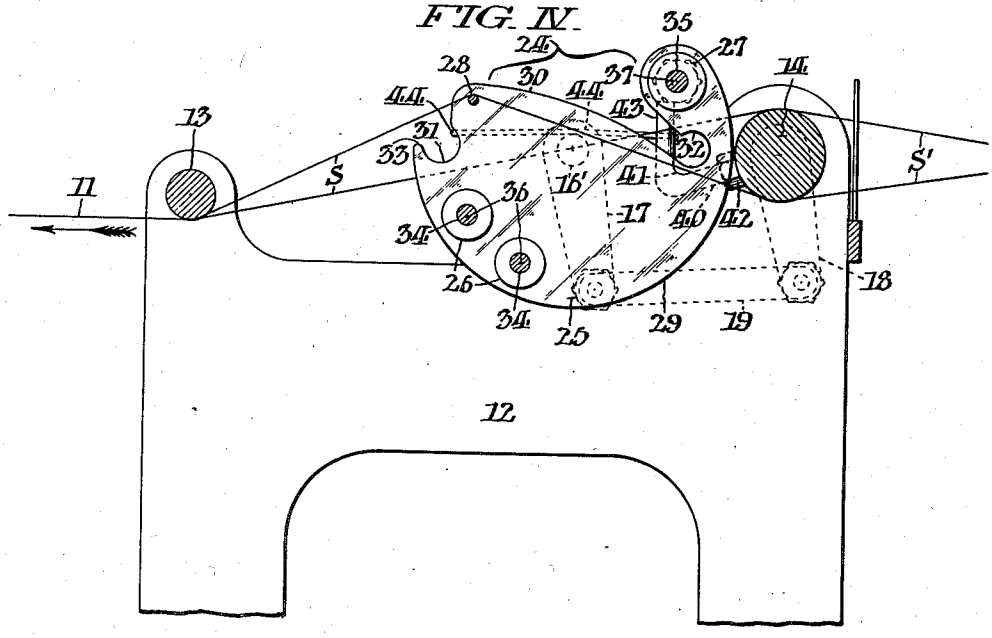
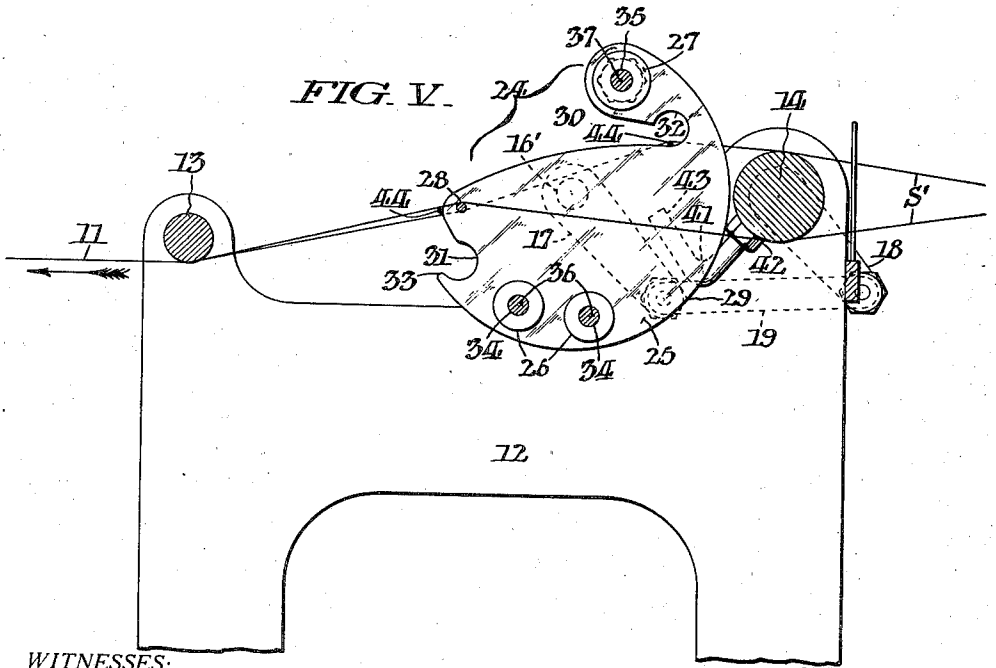


FIG. V.



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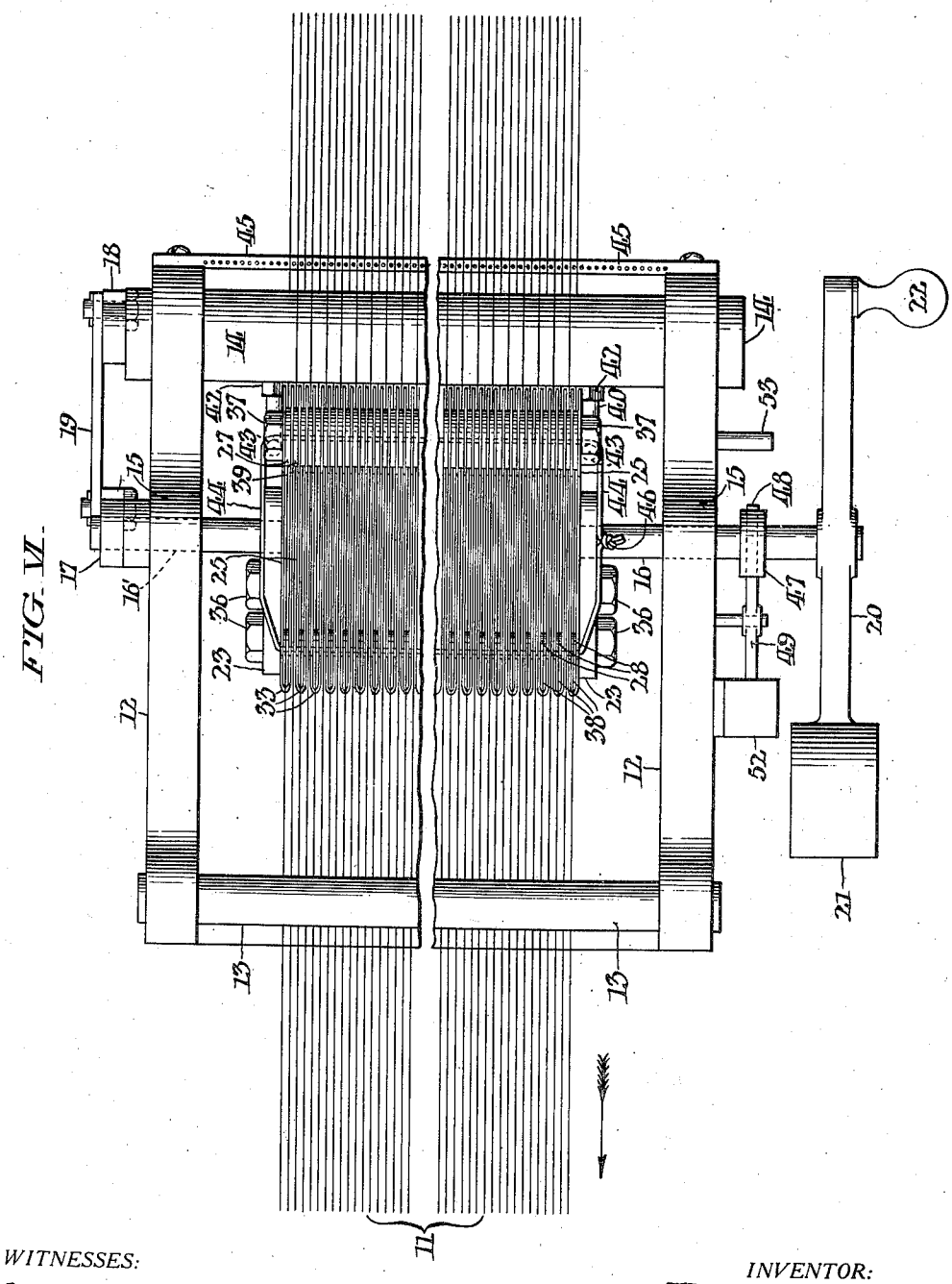
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LEASING MECHANISM FOR WARPING MACHINES.

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FIG. VI.



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Patented May 3, 1938 2,116,179

UNITED STATES PATENT OFFICE

2,116,179

LEASING MECHANISM FOR WARPING MACHINES

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Application March 17, 1936, Serial No. 69,275

18 Claims. (Cl. 28—40)

This invention relates to means for forming lease sheds in moving warps and placing and inserting lease threads through said warps while being wound from one form of package into another without stopping movement of the warps; and it has for a primary object the provision of a novel mechanism whereby the sheds are concurrently formed and so held for insertion of the lease thread.

Another object is to provide a leasing mechanism with means permitting closing of the sheds upon the lease thread and for freeing said thread for travel with the warps.

A further object is to provide a novel mechanism for the indicated purpose which is automatically actuated, at the predetermined intervals, and similarly or manually restored to lease-forming position in an expeditious manner, with incidental increase in the output and a better quality of the work.

The stated and other objects, as will hereinafter appear, are attained by the mechanism illustrated in the accompanying drawings, wherein like characters of reference are applied to corresponding parts in all the views; while the novel features are more particularly expressed in the claims at the conclusion of this specification.

In the drawings:

Fig. I is an elevation of a ball warping equipment including the novel lease-forming mechanism of this invention.

Fig. II is a broken side elevation of the lease-forming mechanism, drawn to a larger scale, and illustrating the same in normal position or when forming a lease.

Fig. III is a similar elevation but showing the mechanism in the out of action position.

Fig. IV is a vertical longitudinal section through the mechanism with the parts in normal position.

Fig. V is a similar sectional view with the parts in inactive relation; and,

Fig. VI is a top plan view of the lease forming mechanism.

Referring to Fig. I, the novel lease-forming mechanism of this invention is therein comprehensively designated by the reference numeral 1; 2 indicates a conventional creel supporting a plurality of spools 3; 4 is a warper including combs 5; 6 is the customary header roll equipment with an associated counter 7 energized from a suitable source of electrical energy 8; and 9 is the winding unit for production of cheeses 10 from the warps 11, in accordance with prevailing practice.

Referring now, more specifically, to Figs. II–VI, the novel leasing-mechanism 1 of this invention is conveniently sustained by spaced standards or side frames 12, maintained in parallel relation by a suitable roller-like tie 13, and a warp-separating roll 14. Journaled in bearings 15 on the side frames 12, intermediate the tie 13 and warp-separating roll 14, is a two-part shaft 16, 16′ operatively coordinated to said roll, at one side of the mechanism, by levers 17, 18, rigidly attached to the shaft section 16′ with a connecting-link 19; while the shaft section 16 is conveniently, although not essentially, fitted at the other side of said mechanism, with an appropriate manipulator 20; or said shaft 16 may be operatively connected to any suitable intermittently-activated power means (not shown), in an obvious manner. The manipulator 20 may, preferably, be in the form of a lever suitably attached to the outer end of the shaft section 16, with a weight 21 at one end, and a hand grasp 22 at the other end, with said weight adapted to hold the mechanism 1, out of action, as later on explained.

The two-part shaft 16, 16′ has secured to its spaced inner confronting ends crank members 23 between which is disposed the novel form of leasing-reed 24, consisting of a series of combined warp-separating and shed-forming elements or thin plates 25, with intervening spacer washers 26, 27 and pins 28. Each plate 25, as best understood from Figs. IV and V, is of special contour, that is to say, it embodies an arcuate edge 29 preferably of a radius coinciding with the axis of rotation of the two-part shaft 16, 16′; an eccentrically related curvature 30 of substantially greater radius to provide easy release for the leases when knotted; a pair of lease thread-engaging notches 31, 32; a warp spacing tip 33; and a plurality of apertures 34, 35 through which clamping means, such as bolts 36, 37 are passed, as well as through the spacing washers 26, 27, to respectively secure said plates to the crank members 23 and to one another. It is to be particularly noted, at this juncture, that the lease thread engaging-notch 32 is well inset relative to that part of the plate 25 through which the clamp bolt 37 passes; the radius of the plate arcuate edge 29 and the journaling of the leasing-reed 24 is such that the latter rotates in close proximity to the warp separating roll 14; while the notches 31, 32, when the leasing reed 24 is assembled, constitute spaced or parallel open passageways respectively to each side of the axis of rotation of said leasing reed. The tips 33 of

each pair of adjoining plates **25** are suitably merged to meeting relation and permanently united thereat, as well as rigidly connected by the spacer pins **28** aforesaid, so as to form alternatingly open and interrupted warp receiving dents **38**, **39**, respectively, between the several plates **25**, for a purpose later on set forth.

Threadedly engaged in the warp-separating roll **14** and flanking the sides of the leasing-reed **24**, are angular guide-holding members **40** which are rounded at their crotches **41**, and rigidly retained at the requisite radial adjustment, relative to the axis of the roll **14**, by lock nuts **42**. The free angular ends **43** of the member **40** are of a linear dimension and inclination such that their termini serve as stops for engagement by the head and nut of the clamp bolt **37**, to limit clockwise rotation of the leasing reed **24**, while the ends of the leasing thread **44** are being tied together.

A suitable comb **45** is, preferably, arranged in spaced relation to the warp separating roll **14**, in order to prevent lateral displacement of said warps during the leasing operation, while **46**, Fig. VI, designates the leasing knot.

In order to hold the leasing reed **24** in the operative position of Figs. II and IV, there is secured to the shaft section **16** at one side of the leasing reed **24**, a dog **47**, the free end whereof is adapted to coact with the tooth portion **48** of a pivoted catch **49**. The other end of the catch **49** is pivotal at **50** to the core extension **51** of a solenoid **52** in circuit with, and under control of, the counter **7**, as shown in Fig. I; and **53** designates a stop projecting from the adjoining side frame **12** with which the dog **47** engages to limit counterclockwise movement of the leasing reed **24**, when it is released and swings to the inoperative position of Figs. III and V.

The manner of forming a lease with the thread **44** is as follows. The warps **11** from the spools **3**, after leaving the warper **4**, pass through the comb **45** alternatingly over and under the warp separating roll **14** and are threaded through the leasing reed **24**; half of said warps being disposed in the open dents **38**, and the other half in the interrupted-dents **39**, so as to be engaged by the cross pins **28** as clearly understandable from Figs. IV and V, whereupon said warps pass under the tie or guide **13** to the header roll **6**, thus normally maintaining lease sheds respectively at opposite sides of the axis of the leasing reed **24**; and from thence to the winding unit **9**, for formation of cheeses **10**. Incidentally it will be apparent that the spacing tips **33** of the leasing reed **24**, as the latter is rocked clockwise, readily pass between the warps **11** and effectively hold them against lateral displacement, with respect to the warps **11** elevated by the spacer pins **28**. Now as will be readily understood from Figs. II and IV, that with the warps **11** alternatingly divided there will be concurrently formed at opposite sides of the axis of rotation of the shaft **16**, **16'** sheds S, S' as a result of the elevation of the one-half of said warps in the dents **38** by the spacer pins **28**. Furthermore, with the lease forming mechanism in its normal position, as shown in Figs. II and IV, and so held by the dog **47** and catch **49**, the guide-holding members **40**, as well as the lease thread passageways **31**, **32** will be in position to permit throwing or insertion of the leasing threads or thread **44** through said passageways. The lease loop is then formed by tying together the ends of the thread as at **46** with the rear end of said thread extending around the backs of the holder projections **43**.

After predetermined lapse of time corresponding to a definite length of warps, solenoid **52** is automatically energized under control of the counter **7**, and the dog **47** released under oscillation of the catch **49**, induced by attraction of the core extension **51** inwards of said solenoid. Thereupon by influence of the weight **21** to the manipulator **20**, the leasing reed will automatically swing from the position of Fig. IV to that of Fig. V, with attendant closing of the leasing shed S in upon the front strand of the leasing thread **44**, and release of the rear strand of said thread by the holding elements **40**. The leasing loop being now free of restraint will thereupon be carried along by the moving warps **11**. The parts **47**, **48** will then be returned into holding coaction by the operator swinging the manipulator **20** clockwise, in an obvious manner, whereupon the leasing reed **24** will be placed in position ready for the next leasing operation after a conventional run of the warps **11**, for example every five-hundred yards.

From the foregoing disclosure of the invention, it will be apparent that various modifications may be made in the same without departing from its fundamentals; hence I do not wish to be understood as limiting myself to the precise form, construction, and arrangement of parts herein shown and described. Accordingly, the right is hereby reserved to all such variations and other uses of the invention as may fairly come within the scope of the following claims.

Having thus described the invention, I claim:

1. In leasing mechanism, a pivotal shed forming device including warp elevating means intermediate alternate dents, said device having spaced passageways for insertion of leasing thread, an associated warp-separating roll, said roll and the pivotal device normally maintaining parallel lease sheds across the warps to each side of the pivotal axis of said device, and means for actuating the device to close the sheds upon the lease thread and to free the lease for travel with the warps.

2. In leasing mechanism, a pivotal shed forming device comprising a series of plate components with intervening spacers, other spacers connecting successive pairs of the components and serving to maintain lease sheds in traveling warps, parallel passageways through the device affording insertion for lease thread, and means for actuating the device to close the sheds upon the lease thread and to free the lease for travel with the warps.

3. In leasing mechanism, a pivotal shed forming device comprising a series of profile plates with intervening spacers, pins connecting successive pairs of the plates and serving to maintain lease sheds in traveling warps, said connected plates also having tip portions mergent inwards and permanently united, parallel passageways through the device affording insertion for lease thread through the sheds aforesaid, and means for actuating the device to close the sheds upon the lease thread and to free the lease for travel with the warps.

4. In leasing mechanism, a pivotal shed forming device comprising a series of profile plates with intervening spacers and means clamping the series rigidly together, pins connecting successive pairs of the plates, said pin-connected plates also having tip portions inwardly merged and permanently united, parallel passageways through the series of plates affording insertion for lease thread through traveling warps, an associated warp-separating roll, said roll and the

pivotal device plate-connecting pins normally maintaining parallel lease sheds across the traveling warps respectively to each side of the pivotal axis of the device, and means for actuating the device to close the sheds upon the lease thread and to free the lease for travel with the warps.

5. In leasing mechanism, a pivotal shed forming device comprising a series of profile plates with intervening spacers and means clamping the series rigidly together, pins connecting successive pairs of the plates, said pin-connected plates also having tip portions inwardly merged and permanently united, parallel passageways through the series of plates affording insertion for lease thread through traveling warps, an associated warp-separating roll, said roll and the pivotal device plate-connecting pins normally maintaining parallel lease sheds across the traveling warps respectively to each side of the pivotal axis of the device, means carried by the warp-separating roll coactive with the shed forming device to hold the lease while its ends are secured together, and means for actuating the device to close the sheds upon the lease and to free it for travel with the warps.

6. In leasing mechanism, a pivotal shed forming device comprising a series of profile plates with intervening spacers and means clamping the series rigidly together, pins connecting successive pairs of the plates, said pin-connected plates also having tip portions inwardly merged and permanently united, parallel passageways through the series of plates affording insertion for lease thread through traveling warps, an associated warp-separating roll, said roll and the pivotal device plate-connecting pins normally maintaining parallel lease sheds across the traveling warps respectively to each side of the pivotal axis of the device, means carried by the warp-separating roll coactive with the shed forming device to hold the lease while its ends are secured together, latch means whereby the shed forming device is normally restrained against pivotal movement, and means operable at predetermined intervals to release said latching means.

7. In leasing mechanism, a pivotal shed forming device comprising a series of profile plates with intervening spacers and means clamping the series rigidly together, pins connecting successive pairs of the plates, said pin-connected plates also having tip portions inwardly merged and permanently united, spaced open passageways through the series of plates affording insertion for lease thread through traveling warps, an associated warp-separating roll, said roll and the pivotal device plate-connecting pins normally maintaining parallel lease sheds across the traveling warps respectively to each side of the pivotal axis of the device, means carried by the warp-separating roll coactive with the shed forming device to hold the lease while its ends are secured together, latch means whereby the shed forming device is normally restrained against pivotal movement, manually-movable means for setting the device in shed forming position, and electrically-controlled means operable at predetermined intervals to release the latching means.

8. The combination of claim 7 wherein each of the shed forming device profile plates embodies an arcuate edge concentric with the pivotal axis of said device, an eccentric curvature of substantially greater radius, a thread engaging notch at each side of the pivotal axis into one of which the eccentric curvature merges, and the other of the notches has an associated tip outwardly mergent into one end of the arcuate edge curvature aforesaid.

9. The combination of claim 7 wherein the shed forming device is rigidly mounted between the confronting crank-ends of a two-part pivotal shaft.

10. The combination of claim 7 wherein the shed forming device is normally held by means of a dog at one end of its shaft being engaged by the toothed end of a pivoted catch, and an extension of the core of a counter-controlled solenoid is pivoted to the other end of said catch.

11. The combination of claim 7 wherein the shed-forming device pivotal shaft is provided with a manipulator lever having a counterweight at one end and a hand grasp at the other, means is provided for latching the device in shed forming position, and a stop is provided for limiting its pivotal movement in a counter-clockwise direction when the latching means is released.

12. The combination of claim 7 wherein the warp-separating roll is provided with lease holding means flanking the series of connected profile plates.

13. The combination of claim 7 wherein the lease holding means carried by the warp-separating roll consist of radially adjustable angle members having the crotch rounded, and said members coact with the proximate lease thread notch of the device to normally close the latter.

14. In leasing mechanism, a pivotal shed-forming device comprising a series of spaced plate components having eccentrically disposed transverse thread-engaging connectors serving to maintain lease sheds in the traveling warps, spaced passageways through the device affording free insertion for the lease thread, and means for actuating the device to close the sheds upon the lease thread and to free the lease for travel with the warps.

15. Leasing mechanism comprising a shedding means for forming juxtaposed lease sheds in travelling warps; holding means around which a lease loop is formed by passage of a lease thread through the sheds; and means for concurrently actuating the shedding means and the holding means to permit the sheds to close in on the lease and to free said lease for travel with the warps.

16. Leasing mechanism according to claim 15, wherein the shedding means and the holding means are pivotally mounted, and also include means whereby said shedding and holding means are operatively connected for simultaneous actuation.

17. In leasing mechanism, guide and warp separating members with an intervening pivotal device to concurrently form spaced lease sheds in traveling warps, means for arresting lease thread when inserted in said sheds, and means for actuating the device to permit closing of the sheds upon the lease thread and to free the lease for travel with the warps.

18. In leasing mechanism, parallel guide and warp separating rolls with an intervening pivotal shed forming device, said device embodying warp elevating means intermediate alternate dents and also including means defining open passageways for insertion of the leasing thread, means for actuating the device to form the lease, and means for freeing the lease for travel with the warps.

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