Feb. 14, 1939. V. C. HASSOLD 2,147,253

METHOD OF AND APPARATUS FOR WARP LEASING

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Fig. 1.

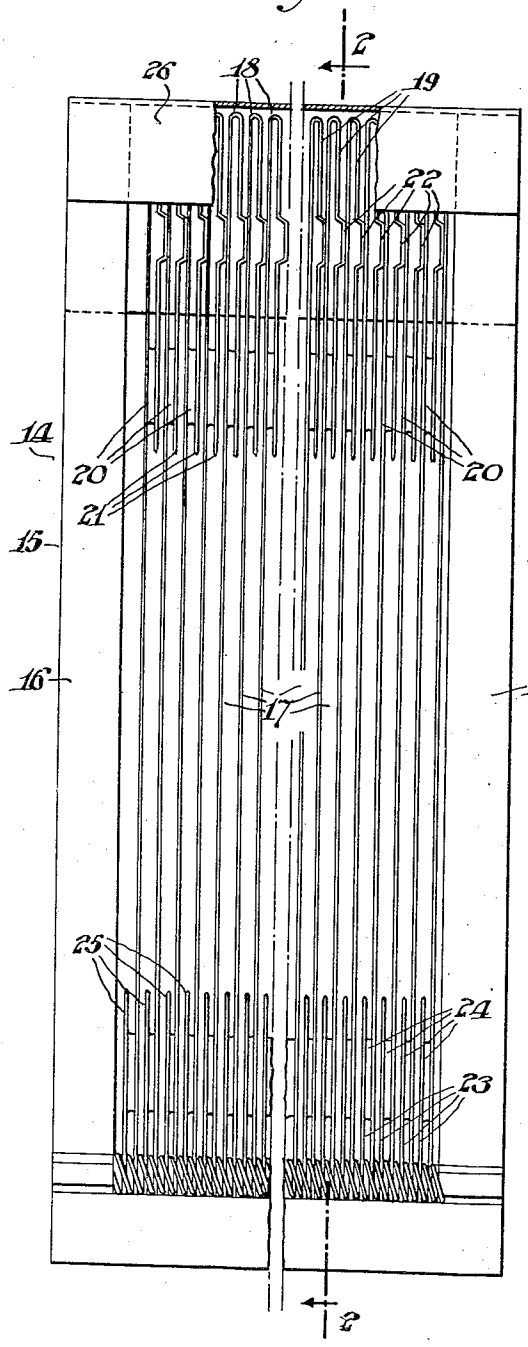


Fig. 2.

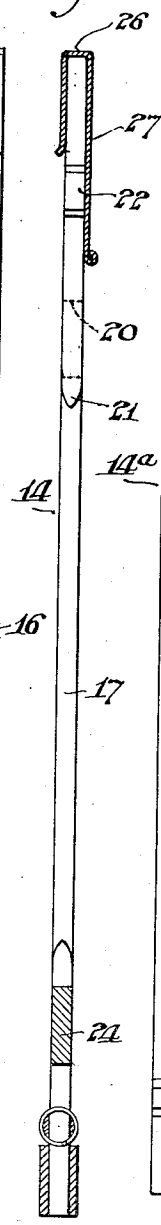
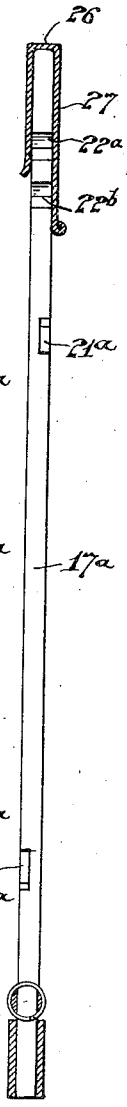


Fig. 3.



Fig. 4.



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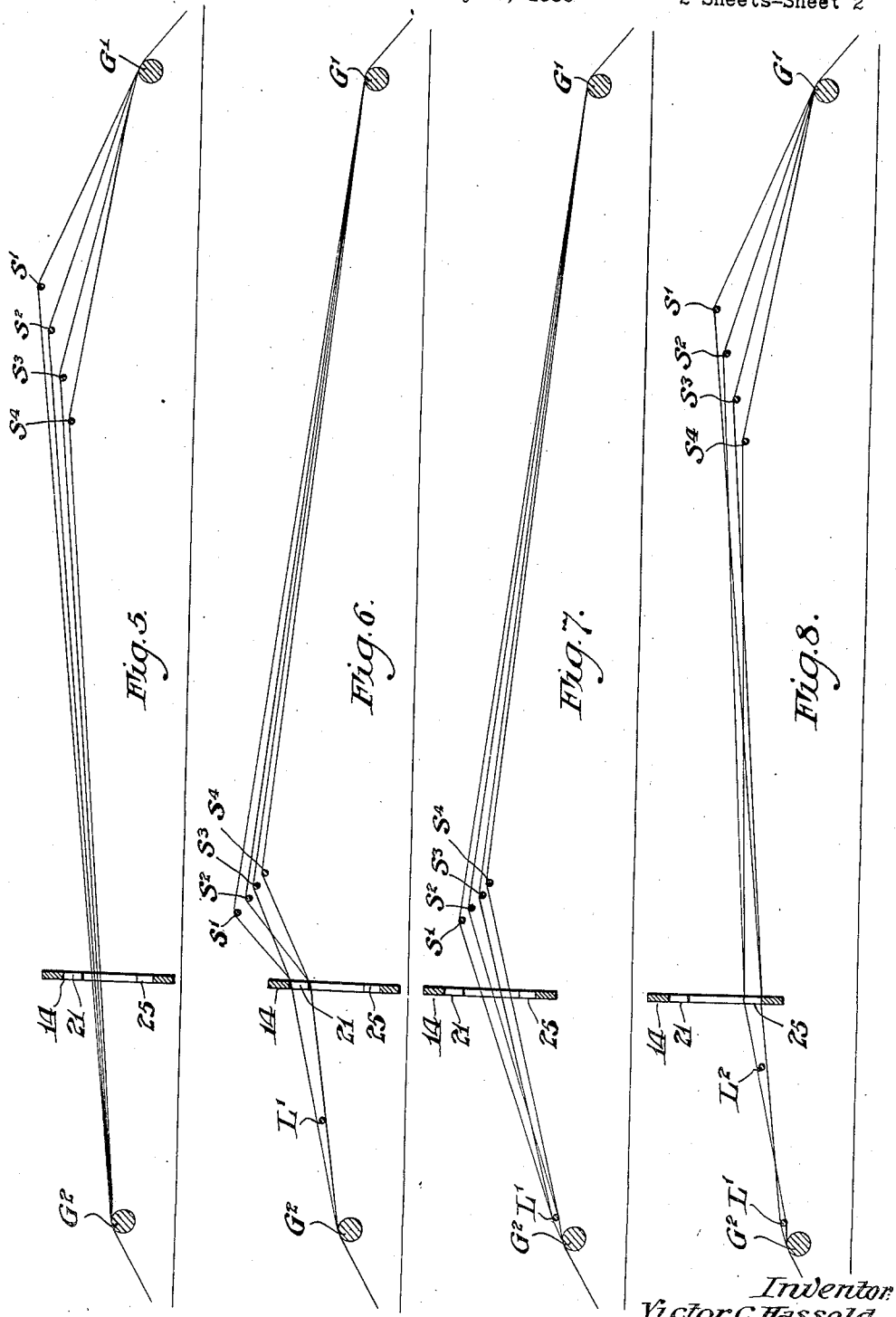


Fig. 5.

Fig. 6.

Fig. 7.

Fig. 8.

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METHOD OF AND APPARATUS FOR WARP LEASING

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Application May 28, 1936, Serial No. 82,161

19 Claims. (Cl. 28—40)

This invention relates to a method of and apparatus for warp leasing, and it has particular relation to a novel way of inserting the leasing cords or rods which are used for maintaining an orderly arrangement of the warp threads, usually at both ends of the winding of the same on the beam, to the end that the drawing-in or entering of the warp through the harness and reed of the loom may be facilitated, and also to facilitate the twisting in of a new warp when the same runs out.

Heretofore it has been customary, where leasing of the warp was desired, to insert the lease cords or rods in the warp before the same passed through the slasher. This method, however, involves the complication of removing the breaker rods at the delivery end of the slasher, causing a considerable loss of time and is, at best, a bothersome operation.

The present invention permits the formation of the lease at the delivery end of the slasher, but it should be understood that the method and apparatus is equally applicable to the making of the lease at any other desired place, in connection with the preparation of the warp.

The method and apparatus of the present invention enables the operator to effect the leasing more rapidly and expeditiously than by the methods at present in common use.

The principal object, therefore, of the present invention is to provide a novel method of and apparatus for forming a lease in the warp which is not only adaptable for use at the delivery end of the slasher but also permits the leasing operation to be done more economically than has heretofore been possible.

With the foregoing object in view, the invention contemplates the provision of a novel form of leasing comb and a novel method of manipulating the warp in connection therewith.

The nature and characteristic features of the present invention will be more readily understood from the following description taken in connection with the accompanying drawings forming part hereof, in which:

Figure 1 is a front elevation, partly broken away, of a leasing comb constituting the principal novel portion of a preferred form of apparatus for carrying out the present invention;

Fig. 2 is a transverse vertical section thereof, taken on the line 2—2 of Fig. 1;

Fig. 3 is an elevational view of a fragmentary portion of a modified form of leasing comb also adaptable for carrying out the invention;

Fig. 4 is a transverse vertical section thereof, taken on the line 4—4 of Fig. 3;

Fig. 5 is a longitudinal section illustrating, to a certain extent diagrammatically, the first step in the formation of a lease in accordance with the present invention;

Fig. 6 is a similar view illustrating the second step in said method;

Fig. 7 is a similar view illustrating the third step in said method; and

Fig. 8 is a similar view illustrating the fourth and final step in the formation of the lease.

Referring now more particularly to Figs. 1 and 2 of the drawings, there is shown a form of construction of a leasing comb 14 embodying the principal features of the present invention and adaptable for use in connection with the method thereof. Said device comprises a suitable frame 15 having side struts 16. Disposed between the side struts 16 are the dents 17, suitably spaced and rigidly secured at their lower ends in the frame 15 in the usual manner of construction of soldered reeds.

Each of the dents 17 there shown comprises a thin flat strip of metal which is bent over at the top as at 18 and thence extends downwardly, the bent-over tongue 19 thus provided being located in the middle of the space between the body portion of the dent and the body portion of the next adjacent dent.

A metallic block 20, preferably made of solder, is positioned between the lower portion of the tongue 19 and the body portion of the dent 17, but, being located a short distance above the end of the tongue 19, there is thus provided a hook-like structure 21 for the selective engagement of the warp ends during the leasing operation.

The tongue portion 19 of each dent 17 is also provided, above the upper end of the block 20, with an offset portion 22 which extends to and bears against the body portion of the next adjacent dent 17. The offset portion 22 is so located in the tongue portion 19 as to bear against a part of the body portion of the next adjacent dent 17 above the upper end of the metallic block 20, whereby advantage may be taken of the normal resiliency of the metal of the dents 17 to permit the ready entering of the warp in the dent spaces of the device, yet serving normally to maintain the upper ends of the dent 17 uniformly spaced in the frame 15.

At the lower end of the frame there is provided a series of auxiliary dents 23 one of these being interposed midway in the dent space between each of the main dents 17. A block of solder 24 is positioned between each of said auxiliary dents and an adjacent main dent 17, being located a

short distance below the upper end of the auxiliary dent whereby there is thus provided a hook-like structure **25** at the lower part of each of the main dents **17** for the selective engagement of the warp ends during the leasing operation.

It should here be noted, however, that preferably the hook device **25** at the lower end of each of the main dents **17** is on the opposite side of the dent from the hook structure **21** which is provided in the upper portion of each of the main dents **17**.

There is also provided means for preventing the warp ends which are not engaged by the hooks in the upper portion of the structure from becoming fouled with the offset portions **22** which are provided to maintain the spacing of the dents at their upper ends. For this purpose there may be provided a cap member **26** made of sheet metal mounted on the upper portion of the frame extending downwardly on both faces, the plate portion **27** on one face thereof extending to a point below the offset portions **22** of the dent **17**.

During the initial entering of the warp in the leasing comb, the cap member will, of course, be removed therefrom to permit the warp ends to be freely placed in their respective dent spaces.

In Figs. 3 and 4 of the drawings there is illustrated a modified form of leasing comb **14a** in which the bent-over tongue portions **19** and inserted metallic blocks **20** and **24** are dispensed with, and in lieu thereof each of the dents **17a** is provided with struck-up hook members **21a** and **25a**, the hook members **21a** being provided in the upper portion of the frame and the hook members **25a** being provided in the lower portion thereof.

In the form of leasing comb **14a** illustrated in Figs. 3 and 4 there is also shown a different means of spacing the upper ends of the dents, each of said dents being provided near its upper end with offsets **22a** and **22b** preferably two or more in number in each dent, as the provision of a plurality of such offsets in each dent will serve to prevent distortion of the individual dents. Furthermore, the offsets of each dent are staggered with relation to the offsets of adjacent dents so that said offsets will in each instance bear against a portion of the adjacent dent which lies in the main plane thereof and which is resilient to a sufficient extent to permit the warp ends to pass into the dent spaces during the initial entering thereof.

The form of leasing comb shown in Figs. 3 and 4 is also provided with a cap member **26** as in the other form.

In Figs. 5 to 8, inclusive, there is shown the manner of manipulation of the warp with respect to the leasing comb (of either form) hereinbefore described. The warp, after leaving the slasher, passes over a guide rod or roller G', extends through the leasing comb **14** by means of which the lease is formed, and then passes over another guide rod or roller G^2. The usual series of separator rods s^1, s^2, s^3 and s^4, are also provided, there being one of these for the warp coming from each section beam on which the warp is primarily wound from the creel, the warp from each section beam passing over its respective separator rod. The separator rods are supported in suitable racks or standards (not shown) between the guide rod G' and the leasing comb **14**. These racks or standards are arranged in such a manner so that each separator rod occupies two different positions in the formation of the lease, these rods being moved successively from one position to the other as hereinafter more fully set forth.

The leasing comb **14** is so mounted that the same may be shifted sidewise with respect to the warp as is customary in the use of the common form of hook reed used for leasing, and if desired mechanism (not shown) of the same type as is used for shifting the common form of hook reed may be used for this purpose, or the same may be shifted by hand.

However, in carrying out the method of the present invention the leasing comb **14** is also shifted to upper and lower positions respectively at different stages in the formation of the lease.

The first step in the formation of the lease is shown in Fig. 5 of the drawings. In this instance, the comb or reed is in its lower position and the separator rods s^1, s^2, s^3 and s^4 are in their rearmost positions, that is, adjacent the guide rod or roller G'. It will be noted that in this position the warp from all the section beams extends through the dent spaces of the leasing comb between the hooks **21** in the upper portion of the comb and the hooks **25** in the lower portion of the comb. The comb is now moved sidewise with respect to the warp, whereupon the separator rod s^1 is moved from its rearward position as shown in Fig. 5 to the forward position as shown in Fig. 6. The warp which passes over the separator rod s^1 will now be carried up free of the hooks **21**, whereupon the comb is then shifted sidewise with respect to the warp but in the opposite direction. Separator rod s^2 is now moved forward from its rearward position, whereupon all of the warp ends controlled thereby will be caught in the respective hooks **21** of the comb. The comb is again shifted sidewise in the original direction and the separator rod s^3 is moved from its rearward to its forward position carrying with it the warp controlled thereby, raising the same upward free of the hooks **21**. The comb is again shifted sidewise in the opposite direction after which the separator rod s^4 is moved forward from its rearward position causing the warp controlled thereby to be engaged by the hooks **21**.

In this manner, the warps controlled by the separator rods s^1 and s^3 will be raised free of the hooks **21** of the leasing comb **14** and the warps controlled by the separator rods s^2 and s^4 will be engaged thereby, separating the same in two sheets as shown at the forward end of Fig. 6 and into the shed like space thus provided, between the two sheets of warp, the leasing cord or rod L' is inserted.

The leasing comb **14** is now raised to the position shown in Fig. 7 of the drawings, causing all of the warp to be free from engagement by the hooks thereof. A reverse actuation of the separator rods is now effected, step by step, the leasing comb, however, being in the proper position so that when the separator rod s^4 is returned from its forward to its rearward position, the warp ends controlled thereby will be caught in the respective hooks **25** in the lower portion of the comb. The comb is now shifted sidewise so that when the separator rod s^3 is returned from its forward position to its rearward position the warp ends controlled thereby will pass freely in the dent spaces beyond the hooks **25** in the lower portion of the comb. Likewise with the warps controlled by the separator rods s^2 and s^1 the leasing comb in each instance being shifted sidewise to selectively en-

gage or permit the warp to pass, as may be required to effect the leasing.

When all of the separator rods are returned to their initial positions, the warp will again be separated by the leasing comb into two sheets as shown at the forward end of Fig. 8, and into the shed-like space thus provided, between the two sheets of warp, the leasing cord or rod L^2 is inserted to complete the formation of the lease. The leasing comb 14 may now be lowered to its initial position and the warp thereafter fed through the same free of engagement by the hooks thereof.

It will be noted that the method employed differs essentially from that in which a hook reed of the ordinary type is employed, in that the double lease is accomplished by the movement of the separator rods from their rearward to their forward positions and back again instead of requiring the same to be returned to their initial positions before the second part of the lease is taken. In this manner a considerable economy in the operation is obtained.

It will also be understood that in the practice of the method it is not essential that a leasing comb of either of the types shown be employed, as a reed having a permanently closed top may be used if the same be provided, in connection with each dent thereof, with two hooks suitably spaced to be operable in the manner hereinbefore set forth. However, the use of the comb-like device permits the warp to be more expeditiously entered in the dent spaces.

I claim:

1. The method of forming a lease in a warp which consists in transposing said warp in sections from one position to another in succession, hooking alternate sections of said warp as the same are transposed thereby to separate said warp into two parts, inserting a lease member in the separation, then unhooking the said warp sections, thereafter again transposing said warp sections in succession and in reverse order, hooking alternate sections of said warp as the same are thus transposed thereby to again separate said warp into two parts, and then inserting another lease member in the second separation.

2. The method of forming a lease in a warp which consists in transposing said warp in sections from one position to another in succession, hooking alternate sections of said warp as the same are transposed thereby to separate said warp into two parts, inserting a lease member in the separation, then unhooking the said warp sections, thereafter returning said warp sections in succession and in reverse order to their original positions, hooking alternate sections of said warp as the same are being returned thereby to again separate said warp into two parts, and then inserting another lease member in the second separation.

3. The method of forming a lease in a warp which consists in raising sections of the warp in succession, hooking the warp of alternate sections as the same are raised thereby to separate said warp into two parts, inserting a lease member in the separation, then unhooking the said warp sections, thereafter lowering said warp sections in succession and in reverse order, hooking the warp of alternate sections as the same are lowered thereby to again separate said warp into two parts, and then inserting another lease member in the second separation.

4. The method of forming a lease in a warp which consists in passing said warp in sections over separator rods, manipulating said separator rods to transpose said warp sections in succession from one position to another, hooking alternate sections of said warp as the same are raised thereby to separate said warp into two parts, inserting a lease member in the separation, then unhooking the said warp sections, thereafter manipulating the separator rods to return said warp sections in succession and in reverse order to their original positions, hooking alternate sections of said warp as the same are being returned thereby to again separate said warp into two parts, and then inserting another lease member in the second separation.

5. The method of forming a lease in a warp which consists in passing said warp in sections over separator rods, manipulating said separator rods to raise said warp sections in succession, hooking alternate sections of said warp as the same are raised thereby to separate said warp into two parts, inserting a lease member in the separation, then unhooking the said warp sections, thereafter manipulating the separator rods to lower said warp sections in succession and in reverse order, hooking alternate sections of said warp as the same are lowered thereby to again separate said warp into two parts, and then inserting another lease member in the second separation.

6. A warp leasing device comprising a frame having dent spaces in which two longitudinally separated hooks are disposed, the hooks in each of said dent spaces being open in opposite directions.

7. A warp leasing device comprising a frame having dent spaces in which two longitudinally separated hooks are disposed, the hooks in each of said dent spaces being open toward each other.

8. A warp leasing device comprising a frame having dent spaces in which two longitudinally separated hooks are disposed, the hooks in each of said dent spaces being open in opposite directions and being disposed on opposite sides of the dent space.

9. A warp leasing device comprising a frame having dent spaces in which two longitudinally separated hooks are disposed, the hooks in each of said dent spaces being open toward each other and being disposed on opposite sides of the dent space.

10. A warp leasing device comprising a frame, a series of dents mounted therein spaced from each other to provide dent spaces therebetween in which the warp is disposed, each of said dents having two hoops at longitudinally separated locations, said hooks being open in opposite directions.

11. A warp leasing device comprising a frame, a series of dents mounted therein spaced from each other to provide dent spaces therebetween in which the warp is disposed, each of said dents having two hooks at longitudinally separated locations, said hooks being open in directions toward each other.

12. A warp leasing device comprising a frame, a series of dents mounted therein spaced from each other to provide dent spaces therebetween in which the warp is disposed, each of said dents having two hooks at longitudinally separated locations, one of said hooks extending into the dent space on one side of the dent and the other of said hooks extending into the dent space on the other side of the dent.

13. A warp leasing device comprising a frame, a series of dents mounted therein spaced from each other to provide dent spaces therebetween

in which the warp is disposed, each of said dents having two hooks at longitudinally separated locations, one of said hooks extending into the dent space on one side of the dent and the other of said hooks extending into the dent space on the other side of the dent, said hooks being open in opposite directions.

14. A warp leasing device comprising a frame, a series of dents mounted therein spaced from each other to provide dent spaces therebetween in which the warp is disposed, each of said dents having two hooks at longitudinally separated locations, one of said hooks extending into the dent space on one side of the dent and the other of said hooks extending into the dent space on the other side of the dent, said hooks being open in directions toward each other.

15. A warp leasing device comprising a frame, a series of dents mounted in said frame, one end of each of said dents being fixedly and permanently secured in said frame, each of said dents comprising a thin flat strip of metal and being provided with an offset portion near the free end pressed out of the plane of the strip and bearing against a portion of an adjacent dent thereby to space the free ends of the dents, each of said dents having two hooks at longitudinally separated locations, said hooks being open in directions toward each other.

16. A warp leasing device comprising a frame, a series of dents mounted in said frame, one end of each of said dents being fixedly and permanently secured in said frame, each of said dents comprising a thin flat strip of metal and being provided with an offset portion near the free end pressed out of the plane of the strip and bearing against a portion of an adjacent dent thereby to space the free ends of the dents, each of said dents having two hooks at longitudinally separated locations, one of said hooks extending into the dent space on one side of the dent and the other of said hooks extending into the dent space on the other side of the dent.

17. A warp leasing device comprising a frame, a series of dents mounted in said frame, one end of each of said dents being fixedly and permanently secured in said frame, each of said dents comprising a thin flat strip of metal and being provided with an offset portion near the free end pressed out of the plane of the strip and bearing against a portion of an adjacent dent thereby to space the free ends of the dents, each of said dents having two hooks at longitudinally separated locations, one of said hooks extending into the dent space on one side of the dent and the other of said hooks extending into the dent space on the other side of the dent, said hooks being open in opposite directions.

18. A warp leasing device comprising a frame, a series of dents mounted in said frame, one end of each of said dents being fixedly and permanently secured in said frame, each of said dents comprising a thin flat strip of metal and being provided with an offset portion near the free end pressed out of the plane of the strip and bearing against a portion of an adjacent dent thereby to space the free ends of the dents, each of said dents having two hooks at longitudinally separated locations, one of said hooks extending into the dent space on one side of the dent and the other of said hooks extending into the dent space on the other side of the dent, said hooks being open in directions toward each other.

19. A warp leasing device comprising a frame, a series of dents mounted in said frame, one end of each of said dents being fixedly and permanently secured in said frame, each of said dents comprising a thin flat strip of metal and being bent over at the free end to form a tongue disposed in an adjacent dent space, a metallic block positioned between said tongue and the body portion of the dent a short distance from the end of the tongue thereby to provide a hook structure, a series of auxiliary dents secured in the frame and a metallic block positioned between each of said auxiliary dents and an adjacent main dent a short distance from the end of the auxiliary dent thereby to provide another hook structure in connection with each main dent.

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