Aug. 27, 1946. O. V. PAYNE 2,406,434

WARP BEAM

Filed March 13, 1945

Fig. 1

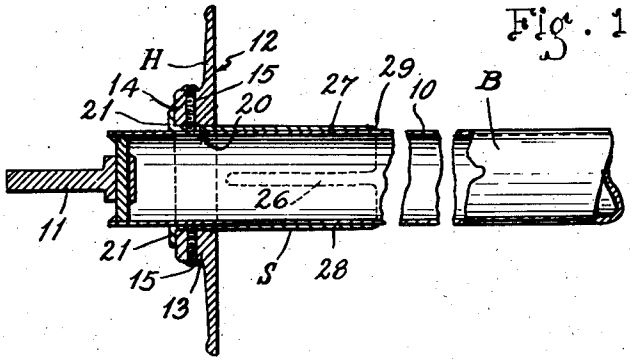


Fig. 2

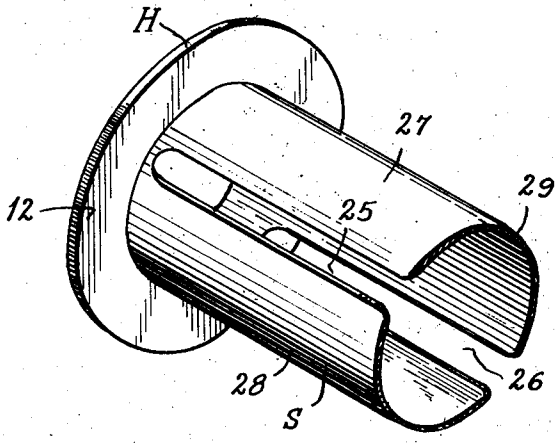
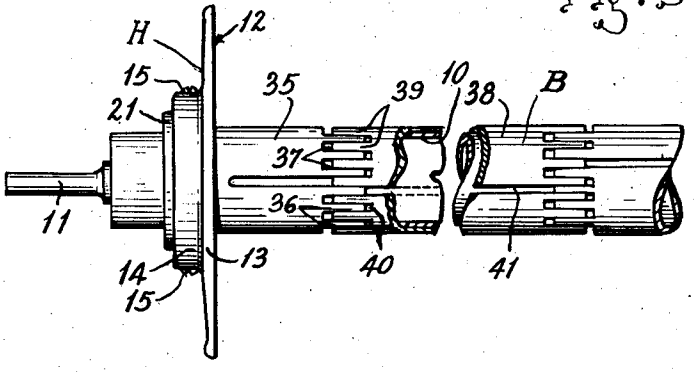


Fig. 3



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WARP BEAM

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9 Claims. (Cl. 242—124)

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This invention relates to improvements in warp beams and it is the general object of the invention to construct a beam in such a way that the pressure of the warp threads can be used to hold the beam head in position.

The warp for looms is generally wound on a beam having a barrel and adjustable heads between which the warp threads are wound on the barrel. In the past a variety of devices have been employed to hold the beam heads in their adjusted position along the barrel, but none of them so far as I am aware have made use of the warp itself to hold the heads in position. As warp is wound the inner layers exert considerable force on the barrel, and in the case of beams made of wood this force is sufficient to crush or deform the barrels. It is an important object of my present invention to utilize this force exerted by the warp threads to clamp a part of the beam head on the barrel tightly enough to prevent endwise slipping. This result can be accomplished by providing the beam head with a split sleeve extending over the barrel in such a way that the warp threads will compress the sleeve and hold it frictionally against the beam barrel.

The aforesaid sleeve will ordinarily be made of thin sheet metal and will add a negligible amount to the winding diameter of that part of the barrel adjacent to the beam head. Where the sleeves are made of thicker material, however, it may be desirable to preserve a uniform winding diameter throughout the used length of the barrel, and to effect this result it is a further object of my present invention to utilize a shell between the sleeves of the heads and form the shell and sleeves with overlapping parts which will in effect provide a winding surface of uniform diameter.

With these and other objects in view which will appear as the description proceeds, my invention resides in the combination and arrangement of parts hereinafter described and set forth.

In the accompanying drawing, wherein two forms of the invention are set forth,

Fig. 1 is a vertical longitudinal section through part of a warp beam having my invention applied thereto,

Fig. 2 is a perspective view of the beam head and attached sleeve shown in Fig. 1, and

Fig. 3 is a view similar to Fig. 1 but showing a modified form of the invention.

Referring to the drawing, the beam B comprises a cylindrical barrel 10 provided with gudgeons 11 one of which is shown in the drawing for support in winding machines and looms. Each end of the beam is provided with a warp head

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H adjustable along the barrel to vary the width of the warp space. Only one head is shown, but it is to be understood that a head such as illustrated in Fig. 1 will be on each end of the barrel. Each head may be formed of metal and has a true inner warp engaging surface 12 formed on a head flange 13 from which extends a hub 14. Small set screws 15 in the hub may be utilized to hold an initial setting of the head prior to the winding operation.

In the preferred form of the invention shown in Figs. 1 and 2, head H has attached thereto a sleeve S formed preferably of thin sheet metal and having an internal diameter only slightly greater than the external diameter of the barrel 10. The sleeve fits the barrel closely but can slide along it when the head is adjusted lengthwise of the beam. The hub of the head has a bore 20 into which the sleeve is driven, and the sleeve may be turned outwardly to form a flange 21 for attachment as by welding or the like to the outer end of the hub.

The sleeve is provided as shown in Fig. 2 with two slots 25 and 26 extending parallel to the axis of the sleeve. These slots are shown as open at their inner ends and at their outer ends terminate close to the flange. The particular form of slot shown in Fig. 2 is not essential. The slots form two resilient sections 27 and 28, respectively, which are capable of movement toward each other under pressure of the warp due to the slots. While I have shown only two slots, yet my invention is not necessarily thus limited, since more slots can be provided if it is desired to provide additional resilient sections. The inner end of the sleeve is preferably tapered as at 29 to avoid an abrupt shoulder between the sleeve and the barrel.

In operation, the heads H will be slid along the barrel to define a warp space of the desired width, after which the set screw 15 of each head is tightened to hold the beam heads in position. The winding operation is then started and as the first wraps of warp are wound on the beam the pressure which they exert forces the resilient sections of each sleeve very firmly against the barrel and holds the sleeve and its flange or head H against longitudinal slippage along the barrel. The set screws may remain tightened if desired but I do not rely upon them to prevent end movement of the head along the barrel.

As the winding continues there is an increasing tendency for the beam head to move longitudinally, but this is offset by the increased tension or force which is exerted by the initial wraps of warp on the resilient sections of the sleeve. The

barrel may if desired be provided with a surface sufficiently smooth to prevent abrasion of the warp threads but possessed of sufficient frictional characteristics to hold the sleeve sections.

In the modified form of the invention shown in Fig. 3 the barrel and head may be as already described, but the sleeve **35** will be made of somewhat thicker material such as to effect a substantial increase in diameter of the winding surface of the beam adjacent to the head. This sleeve **35** will be slotted in a manner similar to that described for the preferred form of the invention, but in addition to the slots will also be provided with teeth **36** separated by slots **37** which indent the inner end of the sleeves **35**. Surrounding the barrel is a shell **38** having teeth **39** to enter the indentations **37** in the sleeve **35** and having slots **40** to receive the teeth **36** on the sleeve **35**. The adjacent parts of the shell and sleeve are therefore constructed with overlapping parts which permit a limited longitudinal adjustment of the head along the barrel while presenting in effect a substantially cylindrical winding surface of uniform diameter extending between the head on the barrel. The shell may also be slotted as at **41** to permit easy application thereof to the barrel. The shell will have but one of these slots and during the winding operation the slot will be narrowed somewhat and the shell will be compressed to grip the barrel tightly in a manner similar to that described for the sleeves of the heads.

From the foregoing it will be seen that I have provided a warp beam having a head with which is associated a part which is forced against the barrel in holding relation with respect thereto by the warp threads. It will further be seen that the sleeves on the heads, while fitting the barrel closely, permit longitudinal adjustment of the head along the barrel, and that the sleeves are provided with compressible sections defined by slots not necessarily open as set forth herein but providing resilient parts connected to the warp head and compressible by the warp thread. In the modified form of the invention it will be seen that an auxiliary shell surrounds the barrel to maintain a uniform winding diameter throughout the effective length of the beam and that the shell has parts which overlap similar parts on the sleeves to prevent the formation of an abrupt shoulder.

Having thus described my invention it will be seen that changes and modifications may be made therein by those skilled in the art without departing from the spirit and scope of the invention and I do not wish to be limited to the details herein disclosed, but what I claim is:

1. In a warp beam having a barrel and a warp head on said barrel, means connected to said head and extending along said barrel and having parts thereof spaced circumferentially and capable of being forced into holding relationship with respect to the barrel by warp threads wound around said parts.

2. In a warp beam having a barrel and a head on said barrel, a plurality of circumferentially spaced means distributed around the barrel and connected to the head and capable of being forced into holding relationship with respect to the barrel by warp threads wound around said means to prevent slipping of the head along the barrel.

3. In a warp beam having a cylindrical barrel, a head mounted on said barrel, and compressible means extending along the barrel and connected to the head and having parts thereof which are forced into holding relation wth respect to the barrel by the force exerted by the warp wound around said means to prevent slipping of the head along the barrel.

4. In a warp beam having a cylindrical barrel, a head mounted on said barrel, a sleeve secured to the head and having parts thereof extending along the barrel and so formed as to be forced into holding relation with the barrel by forces exerted by the warp threads wound around said sleeve to prevent slipping of the head along the barrel.

5. In a warp beam having a cylindrical barrel, a head mounted on said barrel, a sleeve secured to the head and having parts thereof extending along the barrel and circumferentially spaced from each other and capable of being forced into holding relation with respect to the barrel by warp threads wound around said parts to prevent slipping of the head along the barrel.

6. In a warp beam having a barrel and a head thereon, a sleeve connected to the head and having split parts, extending along the barrel and so constructed that the split parts can be forced against the barrel by warp threads wrapped around said parts for the purpose of preventing slippage of the head longitudinally of the barrel.

7. In a warp beam having a barrel and a warp head, a sleeve connected to the head and extending along the barrel and having split portions the exterior diameter of which is greater than the barrel diameter, said portions being forced into holding relation with respect to the barrel by the pressure of the warp threads wound around said split parts, and a split shell of substantially the same exterior diameter as said split portions surrounding said barrel, said sleeve and shell having overlapping parts on which warp threads are wound.

8. In a warp beam having a barrel and a warp head, a sleeve connected to the head and extending along the barrel and having split portions forced into holding relation with respect to the barrel by the pressure of the warp threads wound around said split parts, and a split shell surrounding said barrel, said sleeve and shell having overlapping parts on which warp threads are wound.

9. In a warp beam having a barrel and a head thereon, a sleeve connected to the head and having split parts extending along the barrel and so constructed that the split parts can be forced against the barrel by warp threads wrapped around said parts for the purpose of preventing slippage of the head longitudinally of the barrel, and a split shell surrounding the barrel, said sleeve and shell having complementarily formed overlapping parts on which the warp is wound.

OSCAR V. PAYNE.