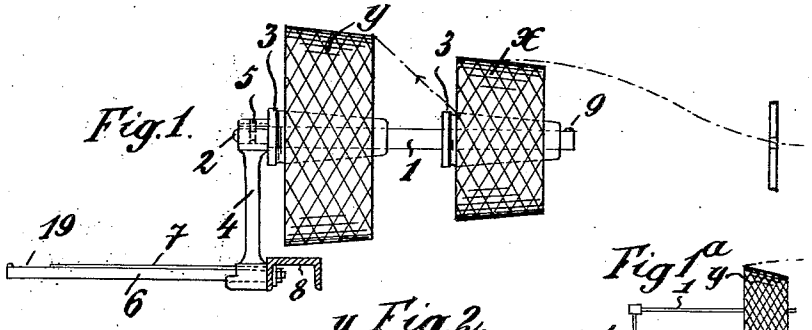
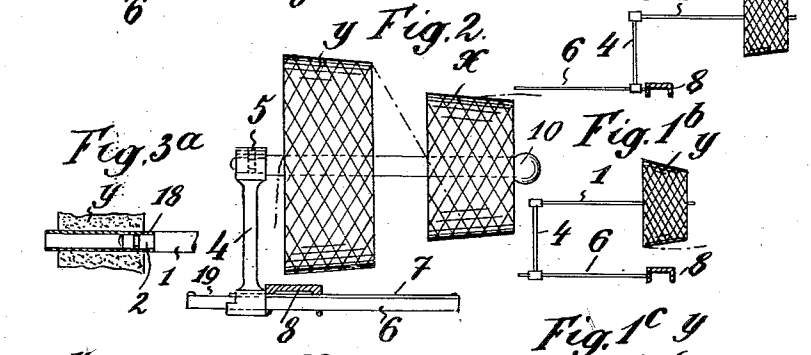
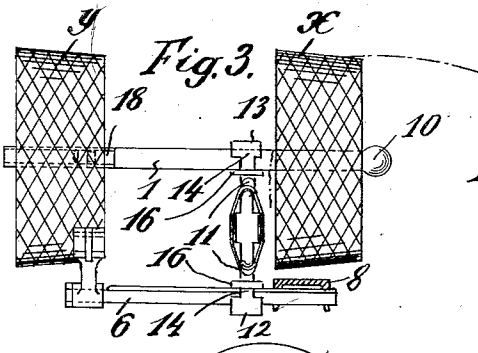
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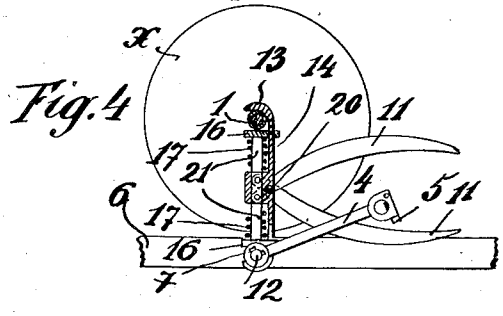
EXCHANGING THE BOBBINS IN PREPARATORY WEAVING MACHINES

Filed Dec. 14, 1928 3 Sheets-Sheet 1









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EXCHANGING THE BOBBINS IN PREPARATORY WEAVING MACHINES

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Fig. 5.

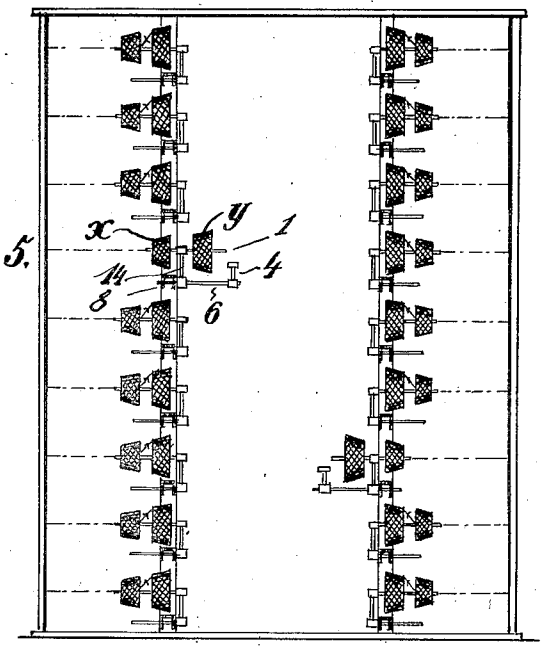
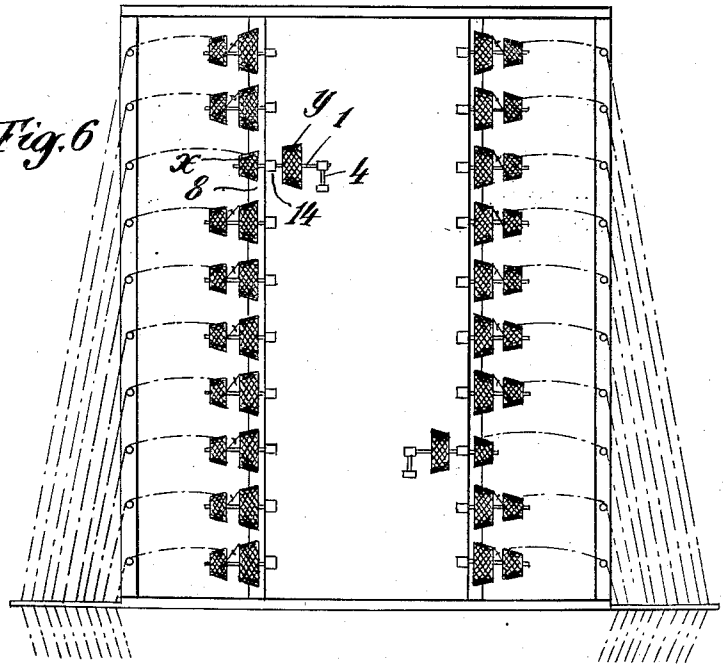


Fig. 6



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EXCHANGING THE BOBBINS IN PREPARATORY WEAVING MACHINES

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Fig. 2a

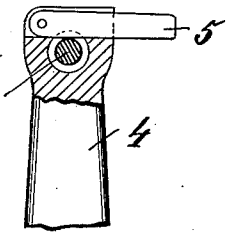


Fig. 4c

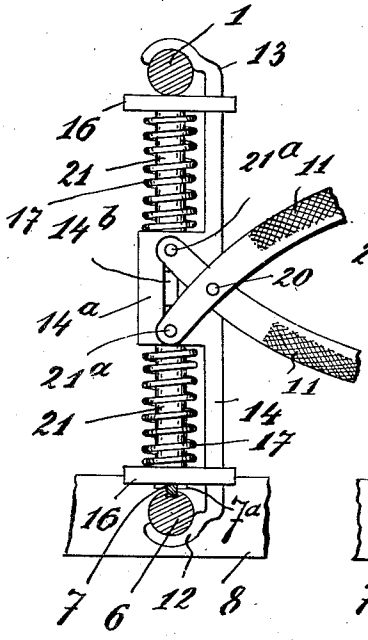


Fig. 4a

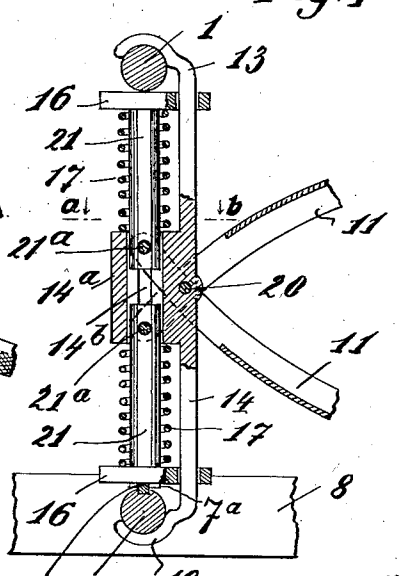
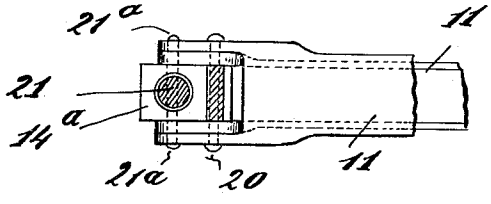


Fig. 4b



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UNITED STATES PATENT OFFICE

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EXCHANGING THE BOBBINS IN PREPARATORY WEAVING MACHINES

Application filed December 14, 1928, Serial No. 326,119. and in Germany January 4, 1928.

The invention relates to improvements in bobbin holders of preparatory weaving machines and has in particular reference to holders of the type in which several cross wound bobbins the ends of the threads of which are tied, are arranged coaxially on a common collecting tube or skewer. These bobbins are put on the common tube that carries them, outside the creel of the warping mill or other preparatory machine and an end of the yarn of one bobbin tied to an end of the yarn of the next bobbin. Therefore an interruption of the operation takes place e. g. with the creel in question each time the bobbins are almost entirely unwound, since the operator must withdraw the bobbin with the thread left thereon and put on the machine two or more full cross wound bobbins with their ends tied together. Furthermore, at least with the rearmost bobbin of the bobbin unit a considerable amount of thread remains thereon, since it is practically impossible, e. g. in a creel of a warping mill feeding a great number of threads, to feed from the rearmost bobbins of each unit up to the last of the thread, more particularly as all of the bobbins never are unwound simultaneously. On the contrary, too frequent interruptions of the warping mill would be caused thereby and in order to avoid this, all of the bobbins must be exchanged simultaneously, so that more or less great amounts of thread must be left thereon. Thus not only an uninterrupted operation of the machine is impossible but also an avoidance of these remnants of threads and the rewinding thereof which occupies much time. Creels have already been designed, in which the tied cross bobbins are arranged side by side with their middle axes adjusted so as to feed toward a common eyelet, in order to obtain in this manner a successive feeding of the cross bobbins. This arrangement, indeed, results in an uninterrupted operation of the creel, it suffers however from the drawback of the creel occupying more than double the space of a normal one.

Now the present invention has for its object to avoid these drawbacks, this being attained on the one hand by a special bobbin holder and on the other hand by uninterruptedly feeding these bobbin holders during the operation of the machine, the bobbins being arranged coaxially.

A further advantage of the new arrangement consists in the said common bobbin tubes or other common thread holders being entirely dispensed with, which members with the known machines serve to mount in common the bobbin units previous to their being put on the creel.

Furthermore the new arrangement makes it possible to slide the bobbins on to the skewers of the creel even entirely without using tubes, whereby the number of the tubes required for the operation is notably reduced.

In order to allow the invention to be more easily understood, two embodiments of same are illustrated in the drawings which accompany and form part of this specification.

Figures 1 and 2 of the drawings are front views respectively of two embodiments of my invention,

Figures 1^a, 1^b, 1^c, 1^d and 1^e are diagrammatic representations in front view of the various steps involved in inserting a new bobbin upon the skewer of my device,

Figure 2^a is an enlarged end view of the upper end of the supporting arm for the skewer partly in section,

Figure 3 is a front view of the device as shown in Figure 2 with the auxiliary arm in place thereon,

Figure 3^a is a detail showing the manner in which a bobbin mounted on a cylindrical tube may be inserted upon the skewer,

Figure 4 is a side view of the arrangement shown in Figure 3 partly in section,

Figure 4^c is an enlarged view of the auxiliary arm showing it in place on the supporting bar and the skewer, both of which are shown in section,

Figure 4^b is a section taken along line *a—b* of Figure 4^c,

Figure 4^a is a view similar to Figure 4^c but showing the auxiliary arm partly in section,

Figures 5 and 6 diagrammatically illustrate a creel in front elevation and plan view,

two bobbin units being shown in exchanging position in each of these Figures 5 and 6.

In all these embodiments 1 denotes the skewer carrying either directly or through the intermediary of a tube 3, the cross wound bobbins x and y. The skewer has a pin 2 by means of which it is detachably mounted on a supporting arm or skewer carrier 4. To this end the pin 2 possesses an annular groove engaged by a suitable cotter or locking bolt 5. On its other end the skewer is provided with a depressible spring bolt 9 or a head 10, Figures 1, 2 and 3, in order to protect the bobbin from gliding off unintentionally. The arm 4 is shiftably mounted on a bar 6 which in turn is arranged either rigidly, Figure 1, or shiftably, Figures 2 and 3, on the common holder 8. The bar 6 may have prismatic of circular cross section. In the latter case it is provided with a feather 7 engaging a groove of arm 4 and recessed at 19 to enable the arm 4 to be swung laterally on this recess.

In the normal operation of the creel the skewer 1 with the two cross wound bobbins x, y and the arm 4 assumes the position illustrated in Figures 1 and 2. When the front bobbin x has been unwound, the feed automatically goes over from bobbin x to the rear bobbin y, since the end of the thread on bobbin x is being tied on the thread on bobbin y. In order to put a new bobbin on the skewer, e. g. on that illustrated in Figure 1, the bobbin y with its tube 3 is shifted toward the free end of the skewer to such an extent that the tube 3 of the empty bobbin x glides over the spring bolt 9 and falls down. Then the state prevails as diagrammatically illustrated in Figure 1a. Thereupon one shifts the arm 4 with the skewer 1 and bobbin y back to the position shown in Figure 1b, whereupon an auxiliary arm 14, Figure 1c is applied between arm 4 and bobbin y. The arm 4 is then swung laterally and a new bobbin is slid on the skewer 1, as shown in Figure 1d. This done, arm 4 is swung back to normal position and its hub is slid on the rear end of skewer 1, the auxiliary arm 14 is removed, the ends of the threads of the two bobbins are tied on one another, and the whole is shifted to normal position, Figure 1e that again corresponds to that shown in Figure 1.

With the embodiment illustrated in Figure 2 the operation is the same with the only difference that it is not arm 4 which is shifted on bar 6, but arm 4 is shifted relatively to the common holder 8 together with bar 6, while the bobbins are mounted immediately on the skewer 1.

Where the bobbins are mounted on thin-walled cylindrical tubes which are to be removed previous to put the bobbins on the skewer, then the skewer must have an outer diameter which corresponds to that of tube 18, Figures 3, 3a, while the pin 2 of skewer 1, which pin in the embodiments of Figures 1 and 2 is lodged in arm 4, has an outer diameter equal to the inner one of tube 18. After having swung laterally arm 4, the new bobbin y is slid with its tube 18 on the pin 2 so that it abuts on the thicker portion of the skewer and the bobbin is now able to slide from its tube over to the skewer. This done, the tube 18 is withdrawn, arm 4 is swung back to normal position and slid on pin 2, whereupon the latter is bolted thereon by the cotter 5.

The auxiliary arm or support 14 may be of any suitable design. In the embodiment illustrated in Figures 3, 4, 4^a, 4^b, and 4^c, this auxiliary arm possesses jaws 12, 13 which by means of suitable hand levers 11, 11 and abutments engage the skewer 1 and the guide bar 6. The two levers 11, 11 are pivoted on a common pin 20 and each of them is hingedly connected to a bolt 21 shiftable along a guide 14. In the middle of the arm 14 is a projection 14^a in which the bolts 21 are each carried. Slots 14^b are provided in which the pins 21^a ride. Each of the bolts 21 is attached to one of these pins 21^a. The ends of the arms 11 are also attached to these pins which thus form the hinged connections referred to above. The abutments mentioned are formed each by a plate 16 shiftable on 14 and acted upon by springs 17, as shown in Figures 4, 4^a and 4^c. Upon compressing the hand levers 11, 11, the two abutments 16 approach one another and the jaws 13, 12 of the auxiliary arm 14 may be removed from skewer 1 and bar 6. In order to maintain however the arm 14 in vertical position which is indispensable, the lower abutment 16 is equipped with an extension that includes a groove 7^a corresponding to the above-mentioned guiding means 7, Figure 1.

In comparison with the arrangement illustrated in Figure 1, that shown in Figures 2, 3, 3^a affords the advantage of notably less bobbin tubes being required in the operation of the machine.

It will be seen from the foregoing that out of the total number of skewers arranged one behind the other in a long row (e. g. 20 to 50 skewers) each individual skewer may be shifted out in the described manner to put on place and tie a new bobbin, without any interruption of the thread feed. The sole but only temporary difference in function consists in the feature that the balloon and the distance existing between the bobbins and the eyelet becomes correspondingly longer, which however is practically immaterial.

As a result of the fact, however, that each skewer device can be shifted out of the row the operator is enabled to more easily apply the auxiliary support 14, and exchange and tie the threads.

Instead of putting on the skewer only one single rear bobbin, several bobbins may be slid thereon and tied on one another in one and the same operation.

Claims.

1. The method of exchanging bobbins in preparatory weaving machines having coaxially mounted cross wound bobbins tied on one another and unwound successively, consisting in removing the empty front bobbin, shifting the next bobbin to front position, shifting back the skewer with the bobbin, propping it immediately behind the front bobbin, removing the normal skewer carrier, sliding from the rear one or more full bobbins on the skewer, re-applying the normal skewer carrier, removing the propping means, tying the threads of the front and rear bobbins on one another, and again shifting the whole unit into forward position.

2. In a machine of the class described a creel, a plurality of skewer carriers mounted on said creel, a skewer easily detachably mounted on each of said carriers, each of said skewers being adapted to support a front bobbin, said carriers being adapted to be shifted on said creel in the axial direction of their skewers, means for swinging said carriers out of operative position when shifted into a rearward end position on said creel, and other skewer carriers mounted on said creel and adapted to temporarily support said skewers behind the front bobbin.

3. In a machine of the class described a creel, a plurality of skewer carriers mounted on said creel, a skewer easily detachably mounted on each of said carriers, each of said skewers being adapted to support a front bobbin, a groove and feather connection provided between each of said carriers and said creel and adapted to permit shifting motion of said carriers on said creel, a recess in said groove and feather connection adapted to permit said carriers to be swung out of operative position when shifted into a rearward end position on said creel, and other skewer carriers mounted on said creel and adapted to temporarily support said skewers behind the front bobbin.

4. In a machine of the class described a creel, a plurality of skewer carriers mounted thereon, a skewer easily detachably mounted on each of said carriers, each of said skewers being adapted to support a front bobbin, said carriers being adapted to be shifted on said creel in the axial direction of their skewers, means for swinging said carriers out of operative position when shifted into a rearward end position on said creel, a retaining means arranged on the free end of each of said skewers for the front bobbin, and other skewer carriers mounted on said creel and adapted to temporarily support said skewers behind the front bobbin.

5. In a machine of the class described a creel, a plurality of skewer carriers mounted thereon, a skewer easily detachably mounted on each of said carriers, each of said skewers being adapted to support a front bobbin, said carriers being adapted to be shifted on said creel in the axial direction of their skewers, means for swinging said carriers out of operative position when shifted into a rearward end position on said creel, a round head on the free end of each of said skewers adapted to admit formation of the balloon by an unwinding thread, and other skewer carriers mounted on said creel and adapted to temporarily support said skewers behind the front bobbin.

6. In a machine of the class described, a creel, a plurality of skewer carriers mounted thereon, a skewer easily detachably mounted on each of said carriers, each of said skewers being adapted to support a front bobbin, said carriers being adapted to be shifted on said creel in the axial direction of their skewers, means for swinging said carriers out of operative position when shifted into a rearward end position on said creel, a tap on said skewers adapted to engage said carrier and having a diameter corresponding to the inner diameter of the bobbin tubes used, the outer diameter of said skewers corresponding to that of said bobbin tubes, and other skewer carriers mounted on said creel and adapted to temporarily support said skewers behind the front bobbin.

7. In a machine of the class described a creel, a plurality of skewer carriers mounted thereon, a skewer easily detachably mounted on each of said carriers, each of said skewers being adapted to support a front bobbin, said carriers being adapted to be shifted on said creel in the axial direction of their skewers, means for swinging said carriers out of operative position when shifted into a rearward end position on said creel, other skewer carriers mounted on said creel and adapted to temporarily support said skewers behind the front bobbin, said last-named carriers comprising jaws adapted to engage said skewers and said creel, and spring-actuated abutments for said jaws.

8. In a machine of the class described a creel, a plurality of skewer carriers mounted thereon, a skewer easily detachably mounted on each of said carriers, each of said skewers being adapted to support a front bobbin, said carriers being adapted to be shifted on said creel in the axial direction of their skewers, means for swinging said carriers out of operative position when shifted into a rearward end position on said creel, other skewer carriers mounted on said creel and adapted to temporarily support said skewers behind the front bobbin, said last-named carriers comprising jaws adapted to engage said skewers and said creel, spring-actuated abutments for said jaws, and a pair of tong-

like mounted hand levers adapted to release said abutments against the action of their springs.

9. In a machine of the class described a creel, a plurality of skewer carriers mounted thereon, a skewer easily detachably mounted on each of said carriers, each of said skewers being adapted to support a front bobbin, said carriers being adapted to be shifted on said creel in the axial direction of their skewers, means for swinging said carriers out of operative position when shifted into a rearward end position on said creel, other skewer carriers mounted on said creel and adapted to temporarily support said skewers behind the front bobbin, said last-named carriers comprising jaws adapted to engage said skewers and said creel, spring-actuated abutments for said jaws, a pair of tong-like mounted hand levers adapted to release said abutments against the action of their springs, and means for maintaining said last-named carriers in supporting position relatively to said creel.

The foregoing specification signed at Cologne, Germany this 28th day of November, 1928.

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