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LOCKING DEVICE FOR LOADING ARM OF DRAWING FRAME

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Fig.1

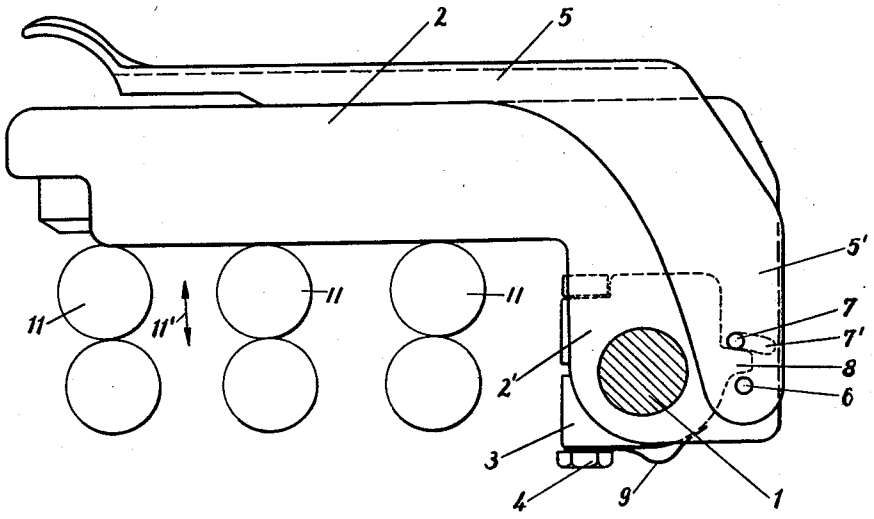


Fig.3

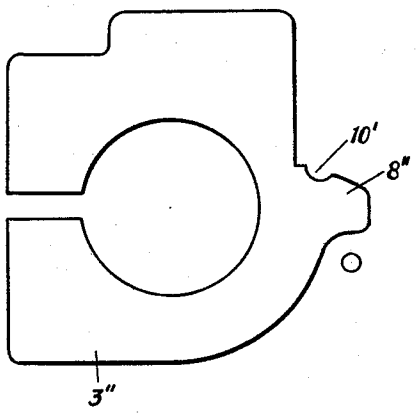
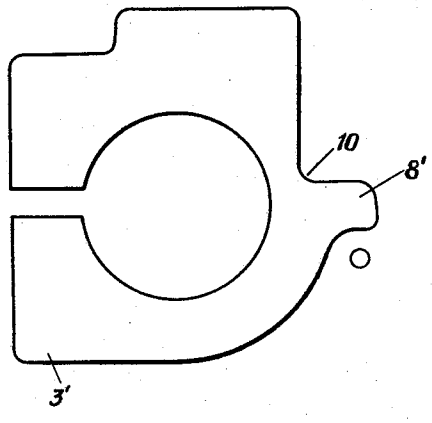


Fig.2



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LOCKING DEVICE FOR LOADING ARM OF DRAWING FRAME

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The present invention relates to a locking device for locking the supporting and loading arm of the upper rollers of a drawing frame in a fixed position so as to maintain the springs under tension which are interposed between the loading arm and the upper rollers and act upon the latter and to prevent these springs from pivoting the loading arm upwardly. The locking device according to the invention essentially consists of a locking lever which extends along and acts upon a considerable part of the loading arm and is pivotably mounted on the loading arm at a point closely behind the pivoting axis of the loading arm.

In locking devices for the supporting and loading arms of drawing frames it is known to provide small two-armed levers with arms of approximately equal lengths, in which one arm serves as a pawl to engage into a recess in the locking member, while the other arm serves as an operating lever. Such locking devices have the disadvantage that, before the pawl can be disengaged it must be released of its load, for example, by depressing the loading arm.

It has therefore already been proposed to provide a longer operating lever which is designed as a toggle lever and in which the short toggle link operates as a knee lever which is either held under spring action or effects the locking action by being placed in a position beyond the dead-center position. Such devices are, however, relatively expensive in production since they have to be made very accurately in order to function properly.

According to other prior proposals, in which long locking levers are provided which are to operate without intermediate links, the loading arm is to be connected to the rearwardly mounted loading spring by means of the locking device. The locking device is in these constructions mounted between the supporting rod and the drawing rollers which requires the loading arm to be made of a greater length which, in turn, means that the rearwardly mounted loading means have to be made of a greater strength.

It is an object of the present invention to overcome the above-mentioned disadvantages by providing a one-armed angular locking lever and by pivotably mounting the same on the supporting and loading arm which the loading springs tend to pivot upwardly, and by providing the locking lever with a locking member which engages upon a stationary abutment which, when the loading arm is in the locked position, projects into the space between the pivoting point of the locking lever on the loading arm and the mentioned locking member. The side walls of the angular part of the locking lever which surround the side walls of the loading arm may for this purpose be provided with a pin which serves as the locking member and extends through an aperture in each side wall of the loading arm. It is advisable to mount the loading arm directly on the supporting rod so as to be pivotable thereon, and to secure the loading arm in a fixed axial position by means of a clamp which is secured to the supporting rod and disposed between the side walls of the loading arm. This clamp has on its rear side a locking projection. The locking lever may be made of a weight sufficient to maintain it in the locking position in which its locking pin, which is connected to the loading arm by extending through the aperture in the side

walls thereof, presses upon the stationary locking projection on the clamp. By locking the loading arm in this manner, it will not as in previous locking devices be necessary first to depress it beyond its operating position, which may be detrimental to delicate yarns.

The locking member may, however, also be designed so that the locking action is effected by friction by providing the apertures in the side walls in the form of elongated slots so that the locking lever can pivot to a certain extent relative to the loading arm and thereby engage frictionally with the stationary projection on the clamp. The locking action may be further secured by providing the stationary locking projection with a groove into which the locking pin may engage in the locked position so as to be held therein by the weight of the locking lever.

The above-mentioned as well as additional features and advantages of the invention will become more clearly apparent from the following detailed description thereof which is to be read with reference to the accompanying sheet of drawings, in which—

FIGURE 1 shows a side view of a loading arm with the drawing rollers which are merely shown diagrammatically, and with the locking lever in the operative position:

FIGURE 2 shows an enlarged view of the clamping member for securing the locking device by friction; while

FIGURE 3 shows a similar view of a clamping member for positively securing the locking device.

In FIGURE 1 of the drawings, a supporting rod 1 carries the loading arm 2 which is pivotably mounted thereon and consists of sheet metal bent to a U-shape. Loading arm 2 carries the upper drawing rollers 11 to which it is connected by springs (not shown) which tend to pivot the loading arm upwardly. A clamping member 3 is clamped by means of a bolt 4 upon the stationary supporting rod 1 and is inserted between the two side walls 2' of loading arm 2 so that the latter is thus prevented from sliding in the axial direction. A locking lever 5 which is likewise U-shaped has downwardly extending side walls 5' surrounding the side walls 2' of loading arm 2 and it is pivotably connected to the latter by a pin 6. Locking lever 5 carries a pin 7 which extends through and is slidable along arcuate slots 7' in side walls 2' of loading arm 2 when lever 5 is being pivoted. When loading arm 2 is to be locked to prevent it from being pivoted upwardly, locking arm 5 is pivoted counterclockwise, whereby pin 7 engages upon the projection 8 on clamping member 3. The weight of locking arm 5 then maintains it in the locked position. For unlocking it, it must merely be lifted by the handle on its front end. Pin 7 then slides off the projection 8, whereby the loading arm 2 is unlocked. If lever 5 is further pivoted in the clockwise direction, pin 7 engages upon the end of slots 7' and thereby takes along loading arm 2 so as to lift it together with the upper rollers 11 off the lower rollers. The head of clamping bolt 4 may also carry a leaf spring 9 which is bent so that when lever 5 is pivoted upwardly pin 6 will slide over spring 9 and will then be arrested thereby to prevent loading arm 2 from falling.

FIGURE 2 illustrates how the locking projection 8' on clamping member 3' should be shaped to effect a frictional locking action. In the operative position, pin 7 engages into the rounded part 10.

FIGURE 3 shows a modification, in which the locking projection 8'' on clamping member 3'' is additionally provided with a groove 10' of an arcuate shape of a radius equal to that of pin 7. When lever 5 is pivoted downwardly to the locking position, pin 7 will first ride along the upper surface of locking projection 8'' and will then engage into groove 10' to be held therein.

Although the embodiments according to FIGURES 2 and 3 do not necessarily rely upon the weight of lever

5 to effect the locking action, the weight of the lever 5 is obviously available to render the locking action more secure.

Although my invention has been illustrated and described with reference to the preferred embodiments thereof, I wish to have it understood that it is in no way limited to the details of such embodiments, but is capable of numerous modifications within the scope of the appended claims.

Having thus fully disclosed my invention, what I claim is:

1. In a drawing frame apparatus having upper rollers, a pivotably mounted loading arm for said upper rollers, said loading arm having side wall portions, an angular one-armed locking lever extending along a considerable part of the length of said loading arm and pivotably mounted on said loading arm about an axis closely behind the pivoting axis of said loading arm, a locking member secured to said locking lever, a stationary member having a locking projection adapted to project into a space provided between said axis of said locking lever and said locking member when said locking lever is pivoted to the locking position, said locking member then engaging over said locking projection in locking engagement therewith.

2. Apparatus as defined in claim 1, wherein a part of said lever adjacent said axis is substantially U-shaped and includes side walls partially surrounding said side wall portions of said loading arm, each of said side wall portions being provided with an aperture extending therethrough, and wherein said locking member comprises a pin secured to said side walls of said locking lever and extending through the apertures in said side wall portions of said loading arm.

3. Apparatus as defined in claim 2, further comprising a stationary supporting rod, said loading arm being substantially U-shaped and pivotably mounted on said supporting rod, and wherein said stationary member is a clamping member clamped upon said supporting rod intermediate the side wall portions of said loading arm

and preventing an axial movement of said loading arm, said clamping member having a rear projection thereon forming said locking projection.

4. Apparatus as defined in claim 2, in which said locking projection has a groove therein, said locking pin being adapted to engage into said groove and to be retained therein when said locking lever is pivoted to its locking position.

5. Apparatus as defined in claim 1, in which the weight of said locking lever is sufficient to maintain said locking member in locking engagement with said locking projection.

6. Apparatus as defined in claim 1, in which said locking member is maintained in the locked position by frictional engagement with said locking projection.

7. Apparatus as defined in claim 1, in which said locking member is maintained in the locked position by being held in positive interengagement with said locking projection.

8. In a drawing frame apparatus, the combination of a pivotably mounted roller loading arm, a locking lever pivotably mounted about an axis closely behind the pivoting axis of said loading arm and adapted to overlie a portion of said loading arm in the locking position thereof, a locking member secured to said locking lever, a stationary member having a locking projection adapted to project into a space provided between said axis of said locking lever and said locking member when said locking lever is pivoted towards the locking position thereof, and said locking member being in locking engagement with said locking projection in the locking position of said locking lever.

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