Arrangement of a thread take-up lever in a sewing machine.

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Description

The present invention relates to an arrangement of a thread take-up lever for the upper thread in a sewing machine.

The purpose of a thread take-up lever is to slacken the upper thread and then to tension it during certain predetermined intervals of the stitch forming procedure. It therefore performs a vertical movement similar to the one performed by the needle bar. Thus, in hitherto known embodiments the same crank on the upper arm shaft is used for driving the needle bar as well as the take-up lever with the difference in that the movement of the latter is delayed by means of an extra link, as the taking up of the upper thread goes on after the needle has reached its upper end position. These previous embodiments occupy an essential space in the upper arm, which space is hard to arrange in a modern sewing machine with control electronics and stepper motor in the upper arm.

By the present invention an arrangement of a take-up lever is presented in which a driving plate of the same is mounted on the shaft driving the needle bar, as e.g. in the Patent Specification DE-C 151 930, and comprises components at its surface turned away from the shaft achieving a better space for the movement of the take-up lever, especially with regard to the design. The designer therewith has eliminated the need of a space for links and arms with bearings and transmissions used together with previous embodiments of take-up levers. The provision of such a driving plate also means that the movement of the take-up lever is timed exactly with regard to the movements of the needle and the loop-taker. An arrangement with this feature shall be carried out in accordance with the invention stated in the characterizing clause of claim 1.

An example of an embodiment according to the invention will be described in the following with reference to the accompanying drawing which shows in fig. 1 an exploded sketch of the arrangement and in fig. 2 a perspective view of the arrangement.

In the exploded sketch all parts in the arrangement are shown separated in the order in which they then are assembled to a complete embodiment of the take-up lever according to fig. 2. A shaft 10 with a chamfering 11 is journalled in the machine body and driven by the motor of the machine. The end of the shaft carries a crank 12 with a crank pin 13 which is in driving connection with a centre disc 14 provided with a center pin 15 and a hole 16 for the crank pin. Finally, the end of the shaft has a curve disc 17 which has a curve contour in the form of a groove 18 which is eccentrically positioned in the disc. All components on the shaft are kept together by a couple of screws 19, 20 and are balanced by means of a counter-weight 21 as a part of the crank which makes an equilibrium to the unsymmetrical mass of the curve disc.

The rest of the components shown to the left in fig. 1 comprises an arm 22 journalled on a pin 24 secured to a plate 23 and a curve follower 25 which projects into the groove 18. The curve follower has a tapered blunt tip 26 which fits to the chamfered side walls 27 in the groove without reaching the bottom, so that a smooth and tight contact between the curve and its follower is established, when the latter is pressed to the curve disc. The pressure is achieved by a blade spring 28 secured in its centre below a nut 29 screwed on a threaded end of the pin 24. Then the spring presses against a projecting end 30 of the curve follower 25. During the movement of the arm 22 this end slides on the surface of the blade spring. The outer end of the arm has a hook 31 on which the upper thread is hooked when threading the machine.

In fig. 2 the arrangement is shown assembled and fastened by screws 32 to a portion 33 of the machine body. The distance between the curve disc 17 and the arm 22 is then so determined that the curve follower abuts the walls 27 of the groove under pressure. When the curve disc rotates, a swing motion is transferred to the arm without any play or noise. The components can be made with good precision and assembled to a working unit without demands for re-adjustment of positions.

The embodiment described shall be seen as an example of the invention. The arrangement can, of course, be modified as to the design of the components without departing from the inventive idea.

Claims

1. An arrangement of a thread take-up lever in a sewing machine including a journalled arm (22) which is driven in an up- and down swinging motion by a rotating curve disc (17) on a shaft (10) perpendicular to the longitudinal direction of the arm (22) and a curve follower (25) secured to the arm in contact with a curve contour (18) in the curve disk, characterized in that the curve contour in the form of a groove has chamfered side walls (27) and the curve follower has a tapered contact surface (26) against these side walls and is forced by an elastic member (28) in direction to the disk.

2. An arrangement according to claim 1, characterized in that the side walls of the groove slope, whereby said groove has a trapezoidal cross section with the short side thereof along the bottom of the groove, and that the curve follower has a blunt tip (26) which engages the side walls of the groove without contacting the bottom thereof.

3. An arrangement according to claim 1, characterized in that the curve follower (25) is positioned between the pivot of the take-up lever and the hook (31) member thereof.

4. An arrangement according to claim 1, characterized in that said groove is circular and eccentric with respect to the axis of the curve disk.
Patentansprüche

1. Fadenhebermechanismus in einer Nähmaschine, umfassend einen schwenkbaren Arm (22), der in einer auf- und abwärts schwingenden Bewegung durch eine rotierende Kurvenscheibe (17) angetrieben ist, die auf einer zur Längserstreckung des Arms (22) senkrechten Welle (10) montiert ist, wobei ein am Arm (22) befestigter Mitnehmer (25) eine Kurvenfläche (18) der Kurvenscheibe abgreift, dadurch gekennzeichnet, daß die Kurvenfläche eine Nut mit keilförmigen Seitenwänden (27) ist und der Mitnehmer mit einer verjüngten Kontaktfläche (26) gegen diese Seitenwände anliegt und durch ein elastisches Glied (28) in Richtung zur Scheibe vorbelastet ist.


4. Mechanismus nach Anspruch 1, dadurch gekennzeichnet, daß die Nut kreisförmig und exzentrisch zur Achse der Kurvenscheibe ist.

Revendications

1. Agencement de levier releveur de fil dans une machine à coudre, comprenant un bras tournillonant (22) qui est entraîné dans un mouvement oscillant montant et descendant par un disque came tournant (17) monté sur un arbre (10) perpendiculaire à la direction longitudinale du bras (22), et une contre-came (25) fixée au bras, en contact avec un profil de came (18) prévu dans le disque came, caractérisé en ce que le profil de came, constitué par une rainure, présente des parois latérales inclinées (27), et en ce que la contre-came possède une surface de contact convergente (26) qui s’appuie contre ces parois latérales et est poussées vers le disque par un élément élastique (28).

2. Agencement selon la revendication 1, caractérisé en ce que les parois latérales de la rainure sont inclinées, de sorte que la rainure possède une section transversale trapézoïdale dont le petit côté s’étend le long du fond de la rainure, et en ce que la contre-came présente une pointe tronquée (26) qui s’appuie contre les parois latérales de la rainure sans entrer en contact avec le fond de celle-ci.

3. Agencement selon la revendication 1, caractérisé en ce que la contre-came (25) est positionnée entre le pivot du levier releveur et le crochet (31) de ce levier.

4. Dispositif selon la revendication 1, caractérisé en ce que ladite rainure est circulaire et excentrique par rapport à l’axe du disque came.