July 4, 1967 K. A. MÜLLERS ETAL 3,329,359

THREAD GUIDE DEVICE

Filed Sept. 10, 1964 2 Sheets-Sheet 1

FIG. 1

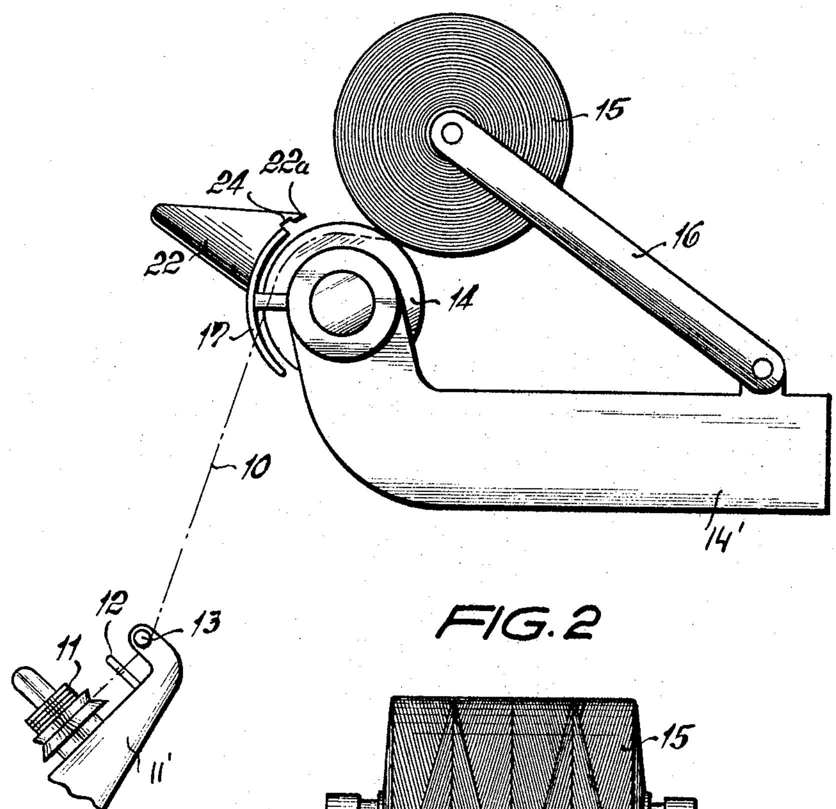
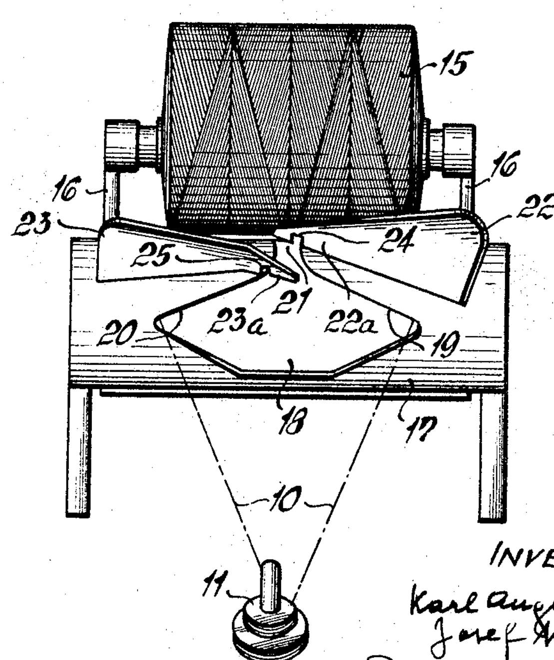


FIG. 2



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THREAD GUIDE DEVICE

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FIG. 3

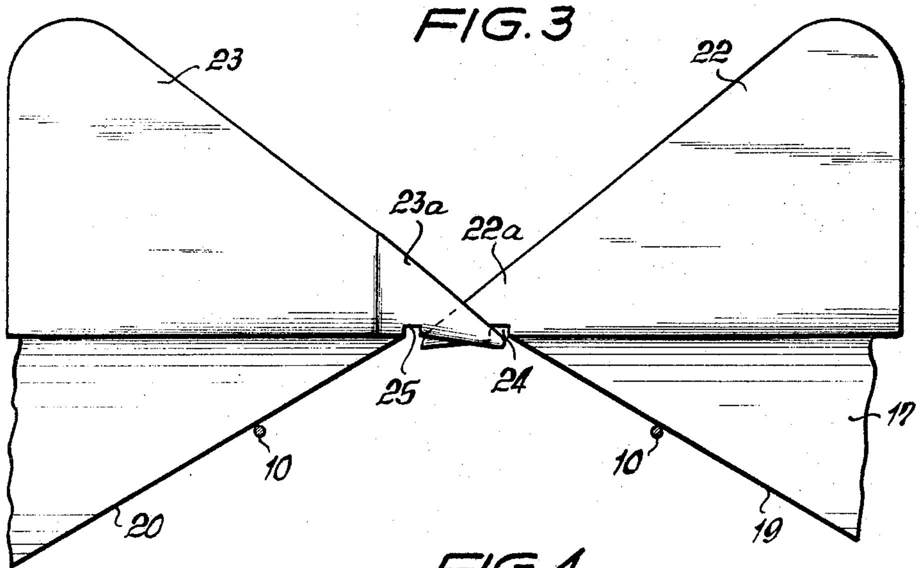


FIG. 4

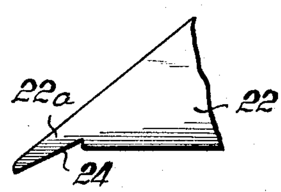
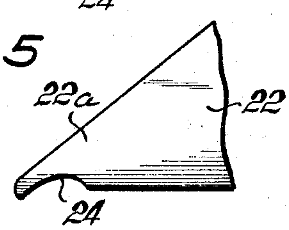
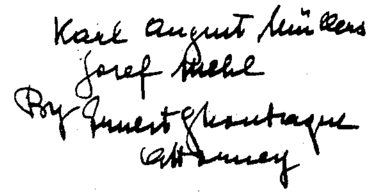


FIG. 5



INVENTOR



United States Patent Office

3,329,359
Patented July 4, 1967

3,329,359

THREAD GUIDE DEVICE

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Filed Sept. 10, 1964, Ser. No. 395,412
Claims priority, application Germany, Sept. 11, 1963, M 58,150
6 Claims. (Cl. 242—18)

The present invention relates to a thread guide device, in general, and to such device, which is disposed at some distance about the periphery of a cross-winder, for instance, a thread guiding drum, of each winding point of a cross-winder, whereby a thread guiding opening is provided within a sheet of the thread guide device, which opening leads on its upper side to a central thread insertion slot.

It is known, that the thread is subjected to certain pulling forces during the winding process, which pulling forces have their origin in the running-off tension of the cops, the balloon formation, as well as in the braking and the releasing. The thread is, thereby, slightly expanded within the elastic range and, in particular, so far until its inner reaction force provides a counter-balance to the outer forces.

If now a thread-break takes place, regardless whether due to a cleaning operation or due to thickened portions in the thread, at the same moment the outer forces, which are effective at the upper thread ends being in connection with the cross-winder, are removed. The still present inner reaction force causes an acceleration of the thread end in the direction of the run of the thread, which acceleration is overlying the thread speed. The end of the thread rushes upwardly and can be positioned next to the cross-spool to the receiving members of the sleeve of the cross-spool and can hook on there. These thread ends are gripped during the reknotting process, if at all only to a small part by a suction arm of an automatic knotting device and are, therefore, often the cause for faulty knottings.

It is, therefore, one object of the present invention to provide a thread guide device, wherein the drawbacks of the known structures are completely avoided.

It is another object of the present invention to provide a thread guide device, wherein, on the one hand, the thread-guide opening narrows down within the thread-guide device, at least towards one side to a thread-insertion slot by forming obliquely extending thread-guide edges and, on the other hand, a catch sheet is provided outside on the thread guide device, on each side of the thread-guide opening, which catch sheet extends with its end point including a catch for the end of a broken thread into the range of the thread-insertion slot and its thread-guide edge, respectively.

In this manner, the upwardly rushing thread end is guided, in the case of a thread break, along one of the obliquely extending thread-guide edges of the thread-guide opening within a thread-guide sheet to the center of the cross-spool and is arrested within the thread-insertion slot in the catch. This arresting is arranged, thereby, so closely to the cross-spool, that the thread end can no more hit now to the side. Faulty knottings, as they were occurring until now, are avoided due to the arrangement designed in accordance with the present invention.

In a practical realization of the present invention, it is now proposed, to form the catch sheets of about triangular shape, which sheets extend about perpendicularly from the thread-guide sheet, and at an acute angle to the longitudinal axis of the groove-drum.

In addition, one end point of at least one of the catch sheets should be bent slightly backwardly relative to the longitudinal axis of this catch sheet, whereby the catch of this end point is disposed at the start of the thread-inserting slot, which start is arranged on the side of the thread-guide opening, while the end point of the other catch sheet projects upwardly opposite the thread-guide sheet, whereby the catch of this end point is disposed at the upper end of the thread-insertion slot.

By this arrangement, it is brought about that one of the two catches is set off forwardly relative to the other, whereby each catch cooperates always with one of the two thread-guide edges limiting the thread-guide opening. It is of no importance for the result, on which of the two thread-guide edges of the thread-guide opening the end of the broken thread abuts. In each case, an arresting of the thread end on one of the two catches takes place in the center of the cross-spool, so that the rushing out of the thread to the side is avoided.

The catches on the end points of the catch sheets can be formed by step-like set-offs of the lower edges engaging the thread-guide sheet, as well as by a one-sided recess of these lower edges.

The thread-guide opening within the thread-guide sheet should be formed, in accordance with the present invention, as a mirror-image to an imaginary center plane extending through the thread-insertion slot, whereby this opening can have finally an about rhomboidal-shaped configuration.

With these and other objects in view which will become apparent in the following detailed description, the present invention will be clearly understood in connection with the accompanying drawings, in which:

FIGURE 1 is a schematic side elevation of a winding position;

FIG. 2 is a front elevation of the same winding position;

FIG. 3 is a front elevation of the catch sheets only with the thread-guide edges of the thread-guide opening;

FIG. 4 is a fragmentary view of the end point of a catch sheet with a step-wise set-off catch; and

FIG. 5 is a view similar to that of FIG. 4, with a catch which is formed by a one-sided recess of the lower edge of the catch sheet.

Referring now to the drawings, the thread guide device comprises a thread brake **11** carrying adjacent thereto a thread-cleaner **12** and also a reversing member **13**, the members **11**, **12** and **13** being mounted on a common bracket **11'**. A thread displacing member **14**, which can be formed as a groove-drum, is mounted on another bracket **14'**, which is disposed adjacent to a winding spool **15**, supported by a spool carrier **16**.

During the winding process, the thread **10** runs from cops (not shown) at first through the thread brake **11**, reaches then through a thread cleaner **12** over a reversing member **13** into the thread displacing member **14** and is wound by the latter on the winding spool **15**.

The groove-drum **14** has arranged in front thereof a thread-guide sheet **17**, respectively, which is equipped with a thread-guide opening **18**, which has an about rhomboidal-shaped configuration. This thread-guide opening **18**, which is limited by the inclined extending thread-guide edges **19** and **20**, leads on its upper side into a thread-insertion slot **21**.

Catch sheets **22** and **23** of substantially triangular configuration are secured to the thread-guide sheet **17** such, that they extend substantially perpendicularly to the thread-guide sheet **17**, and at an acute angle to the longitudinal axis of the groove-drum **14**. These catch sheets **22** and **23** extend with their end points **22***a* and **23***a*, re-

pectively, up to the range of the thread-insertion slot **21**. he end points **22***a* and **23***a* of the catch sheets **22** and **3** have at the height of the thread-guide edges **19** and **20** atches **24** and **25**, which serve the arresting of the end f a broken thread. The end point **23***a* of the catch sheet **3** is bent slightly backwardly such, that the catch **25** is lisposed at the start of the thread-insertion slot **21**, while he end point **22***a* of the other catch sheet **22** projects elative to the upper edge of the guide sheet such, that he catch **24** of this catch sheet **22** is disposed at the end of the thread-insertion slot **21**.

If now a thread break of the thread **10** occurs and if he thread end is disposed just at the thread-guide edge 19 of the thread-guide slot **18**, the upwardly rushing thread nd is guided to the thread-insertion slot **21** and is arested by the catch **24** of the catch sheet **22**. If the thread nd of the broken thread **10** is positioned, however, just n the thread-guide edge **20** of the thread-guide operatng **18**, this thread end is arrested by the catch **25** of the catch sheet **23**. Thus, a particular catch cooperates with each thread-guide edge of the thread-guide opening **18**, so that each end of a broken thread, wherever it is located, is safely gripped and arrested by one of the two catches **24** and **25**. Thus, the upwardly rushing thread end is freed always and in each case by one of the two catches only shortly before reaching the cross-spool in its center, whereby the hitting out of the thread end to the side is effectively prevented.

It is to be understood that the shown and described embodiments of the present invention amount to examples only for the realization of the present invention and are not limited thereto, rather within the scope of the present invention other embodiments, particularly as to configuration and position of the catches are possible.

It is to be understood that these embodiments are given by example only and not in a limiting sense, the scope of the present invention being determined by the objects and the claims.

We claim:

1. A thread guide device disposed at a distance from the periphery of a grooved thread guide drum of a cross-winder, comprising

a guide sheet having a thread guide opening leading to a central thread-insertion slot,

said thread guide opening narrowing down within said sheet at least on one side toward said thread-insertion slot with simultaneous formation of inclined thread guiding edges, and which includes

a catch sheet disposed on each side of said thread guide opening outside on said guide sheet, each of said catch sheets having an end including slot catch means for the end of a broken thread and extending into the range of said thread-insertion slot and said thread guide opening respectively.

2. The thread guide device as set forth in claim **1**, wherein

each of said catch sheets being of substantially triangular configuration and extending substantially perpendicular to said guide sheet and at an acute angle to the longitudinal axis of said grooved guide drum.

3. The thread guide device as set forth in claim **1**, wherein

said end of at least one of said catch sheets being bent backwardly relative to the longitudinal axis of said one of said catch sheets, said slot catch means of said end being disposed at one end of said thread-insertion slot, while

said end of the other of said catch sheets projects upwardly opposite said one catch sheet, and

said slot catch means of said last mentioned end being disposed at the other end of said thread-insertion slot.

4. The thread guide device, as set forth in claim **1**, wherein

said slot catch means comprises a step-like set-off on the lower edge of each of said catch sheets engaging the periphery of said thread guide sheet.

5. The thread guide device as set forth in claim **1**, wherein

said slot catch means comprises a one-sided open recess on the lower edge of each of said catch sheets engaging the periphery of said thread guide sheet.

6. The thread guide device, as set forth in claim **1**, wherein

said thread guide opening is of a rhomb-shaped configuration.

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