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Vahle et al.

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[54] QUICK THREADING THREAD GUIDE FOR SEWING MACHINES

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[52] **U.S. Cl.** ..... **242/157**, 112/218 R

[51] **Int. Cl.** **B65h 57/04**

[58] **Field of Search** ....112/218 R; 242/157 R, 157 B; 57/106

[56] **References Cited**

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Primary Examiner—H. Hampton Hunter

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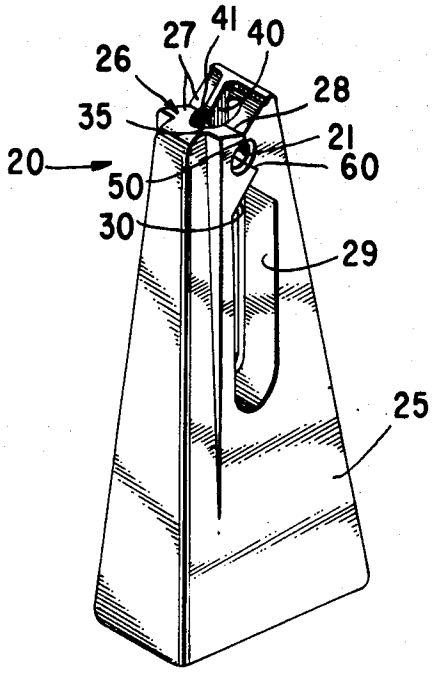
[57] **ABSTRACT**

A sewing machine thread guide with a self-threading eyelet into which a thread may be admitted without passing the thread endwise through the eyelet. The eyelet is formed between a thread introduction "V" notch and an elongate slot. Opposite sides of the thread guide are intentionally forced apart to form a crack between the thread introduction "V" notch and the eyelet, and a crack between the eyelet and the elongate slot. Because of the angularity of the walls of the "V" notch, a thread forced downwardly therein will force open the crack leading to the eyelet for passage therethrough of the thread. Since the eyelet is rounded, a thread therein forced downwardly will not open the crack leading to the elongated slot, which serves only to augment the capacity of the cracked apart portion between the thread introductory "V" notch and the eyelet to flex apart to admit passage of the thread. A thread deflecting fin extending transversely across the path of thread through the eyelet not only imposes a light tension to thread directed through the eyelet, but also prevents any appreciable force from being applied by a thread in the eyelet along the crack which might unthread the eyelet.

3 Claims, 6 Drawing Figures



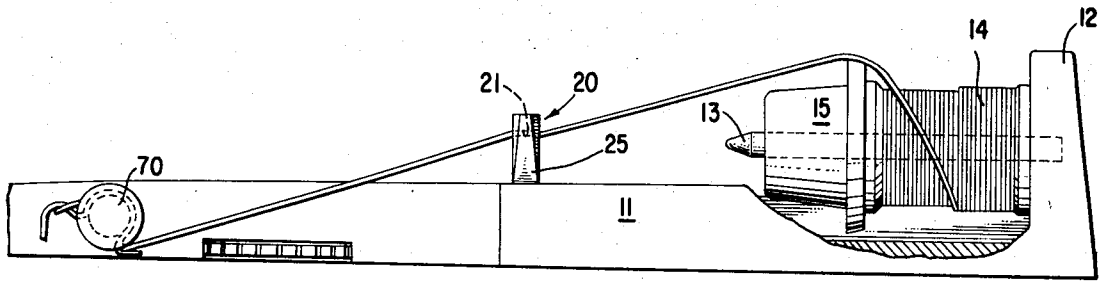


Fig. 1

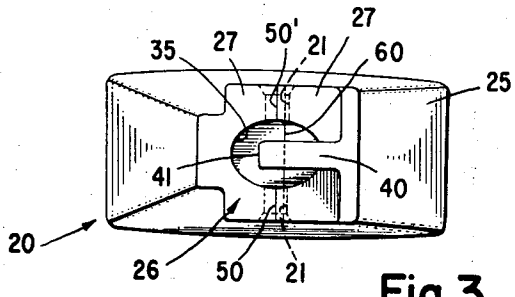


Fig. 3

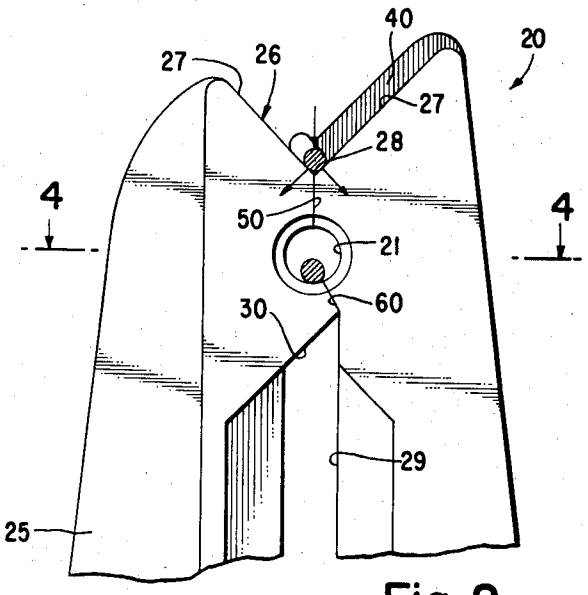


Fig. 2

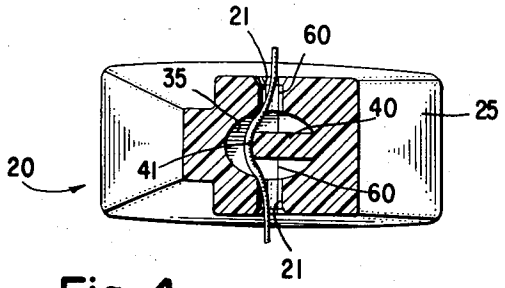


Fig. 4

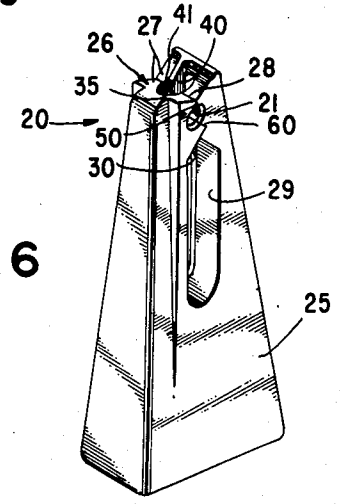


Fig. 6

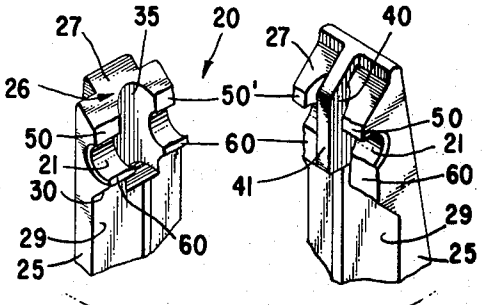


Fig. 5

QUICK THREADING THREAD GUIDE FOR SEWING MACHINES

BACKGROUND OF THE INVENTION

Known thread guides which are self-threading suffer from one or more of the disadvantages that introduction of the thread thereto is confusing or difficult, that the thread can escape from the eyelet easily, or that they require projecting parts which may become easily snagged or caught by the thread during sewing.

BRIEF SUMMARY OF THE INVENTION

It is an object of this invention to provide a self-threading eyelet into which thread may be easily introduced laterally without danger of escape therefrom nor danger of snagging or entangling during sewing. These objects of this invention are obtained by a thread guide construction in which a stress induced crack is formed leading to the eyelet through which the thread may be forced into the eyelet from an introduction notch. Because of the shape of the notch a force applied as a result of tension in the thread will cause the crack to open to admit entry of the thread but because of the shape of the eyelet, forces resulting from tension in the thread in the eyelet cannot cause the crack to open for escape of the thread.

A further object of this invention is to provide a means for defining a desirous path for the thread through the eyelet which will not only give rise to a light tension as the thread passing through the eyelet, but will also further deter escape of thread from the eyelet by preventing a force from being applied to the thread along the crack.

DESCRIPTION OF THE DRAWING

The accompanying drawing illustrates a preferred embodiment of this invention in which:

FIG. **1** is a side elevational view of a thread spool support on a sewing machine frame and includes a thread guide embodying this invention,

FIG. **2** is an enlarged elevational view of the thread guide of FIG. **1**,

FIG. **3** is an enlarged top plan view of the thread guide of FIG. **1**,

FIG. **4** is an enlarged horizontal cross sectional view of the thread guide taken substantially along line **4—4** of FIG. **2**,

FIG. **5** is a perspective view of the thread guide of this invention showing the two cracked apart halves thereof separated and turned apart 90°, and

FIG. **6** is a perspective view of the whole thread guide.

FIG. **1** in the drawing illustrates a fragment of a sewing machine frame **11** formed with a supporting boss **12** carrying a thread spool pin **13**. A conventional thread spool **14** is held on the spool pin **13** against the boss **12** by a thread unwinding aid **15** which frictionally engages the spool pin and serves the double purpose of shrouding one flange of the thread spool and also of deterring rotation of the thread spool so that axial unwinding of the thread from the spool will be encouraged.

In the drawing, the thread guide of this invention indicated generally at **20** is illustrated in a preferred form for location on the sewing machine frame **11** in a position in which the thread guiding eyelet **21** of the thread guide is arranged substantially along the axis of the thread spool pin **13**. It will be appreciated, however, that the thread guide of this invention may be applied and utilized in any location in which a thread guide is required on a sewing machine or similar device.

As illustrated in FIGS. **1**, **2** and **6**, the thread guide **20** preferably takes the form of a rectilinear post **25** formed at the top with a V-shaped thread introducing notch **26**. The walls **27** of the thread introducing notch **26** diverge from a vertex **28** which is located substantially along the vertical centerline of the round thread guiding eyelet **21** which extends through the post **25** beneath the thread introducing notch **26**. Beneath the thread guiding eyelet **21**, the post is provided with an elongated aperture **29** which is formed with an upper extremity **30** extending laterally to one side of the vertical centerline of the thread guiding eyelet.

Formed centrally in the top of the rectilinear post and extending transversely of the thread guiding eyelet **21** is a recess **35** which thus divides the eyelet into two spaced segments designated at **21** and **21'** in FIGS. **3**, **4** and **5** of the drawing. Preferably the recess **35** extends substantially to the level of the upper extremity **30** of the elongate aperture **29**.

Projecting from the post **25** at one side of the recess **35** is a thread deflecting fin **40** which extends transversely across the thread guiding eyelets **21**, **21'** so that the path for a thread T which is directed through the eyelets **21**, **21'** must curve about the free edge **41** of the thread deflecting fin **40**. The thread deflecting fin may be made as a separate member and secured to the post **25**, or as shown in the drawing, the fin may be preferably formed as an integral extension of the post.

Fabrication of the thread guide of this invention thus far described is completed by applying forces to the diverging walls **27** of the V-shaped thread introduction notch **26** so as to form cracks **50**, **50'** between the vertex **28** of the V-shaped thread introduction notch **26** and the thread directing eyelet **21**. The application of such forces also causes a crack **60** to be formed between the thread directing eyelet **21** and the upper extremity **30** of the elongated aperture **29**. As shown in the drawing, the cracks **50**, **50'** will follow the shortest path which is substantially along the vertical centerline of the eyelet **21** while the crack **60** will also follow the shortest path which is laterally offset from the vertical centerline of the eyelet because of the offset location of the upper extremity **30** of the elongated aperture.

When a thread is placed in the v-shaped notch **26** and pulled downwardly, the force resolution because of the diverging walls **27** as shown in FIG. **2** will cause the cracks **50**, **50'** to open admitting the thread therethrough into the eyelet **21**. Once the thread is in the eyelet **21**, a tension applied to the thread when the thread is adjacent to the crack **60** or adjacent to the cracks **50**, **50'** will not give rise to a force resolution tending to open the cracks because of the circular conformation of the eyelet **21**.

Because the crack **60** is located laterally offset from the vertical centerline of the eyelet **21** where the thread will be located most prevalently, passage of thread from the eyelet through the crack **60** is further discouraged.

Unthreading of the eyelet **21** is also further discouraged by the thread deflecting fin **40** which

forces the thread to assume a path through the eyelets **50, 50'** which as illustrated in FIG. **4** is not parallel to the cracks **50, 50'** or **60**. The devious thread path dictated by the thread deflecting fin **40** has the additional advantage of applying a light tension to any thread which is drawn lengthwise through the thread guiding eyelets **50, 50'** which is of particular benefit where the thread is directed to a thread tensioning device **70** from a stationary thread spool which is axially unwound as shown in FIG. **1**. The axial unwinding of thread provides such low thread tension that difficulty can be experienced in keeping the thread properly in the tensioning device. The slight tension imposed by the thread deflecting fin **40** obviates this difficulty.

Having set forth the nature of this invention, what is claimed herein is:

1. A self-threading thread guide comprising a post formed transversely with a round thread accommodating eyelet, said post being formed above said thread accommodating eyelet with a thread introduction notch having substantially straight diverging sidewalls, a transverse aperture formed in said post beneath said thread accommodating eyelet, said post being divided into opposing bifurcations substantially along the shortest path between said thread introduction notch and said thread accommodating eyelet and divided into opposing bifurcations substantially along the shortest path between said thread accommodating eyelet and said aperture.

2. A self-threading thread guide as set forth in claim **1** in which the vertex of said thread introduction notch is arranged substantially on the centerline of the round thread accommodating eyelet which extends lengthwise of said post, and in which said transverse aperture extends closest to said round thread accommodating eyelet at a point laterally offset from said centerline of said eyelet.

3. A self-threading thread guide as set forth in claim **1** in which said post is formed with a central recess arranged lengthwise of said post transversely of said thread introduction notch and said thread accommodating eyelet and extending beyond each side of said thread accommodating eyelet, and in which a thread deflecting fin projects into said recess transversely, said thread deflecting fin being carried by said post at one side of said thread accommodating eyelet and being formed with a free extremity disposed at the opposite side of said thread accommodating eyelet for defining a devious path for a thread passing through said eyelet.

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