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TRAVERSE THREAD GUIDE

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Fig. 1

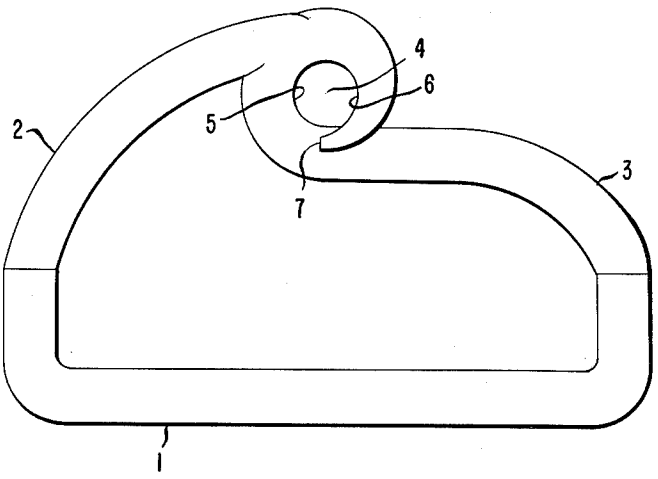
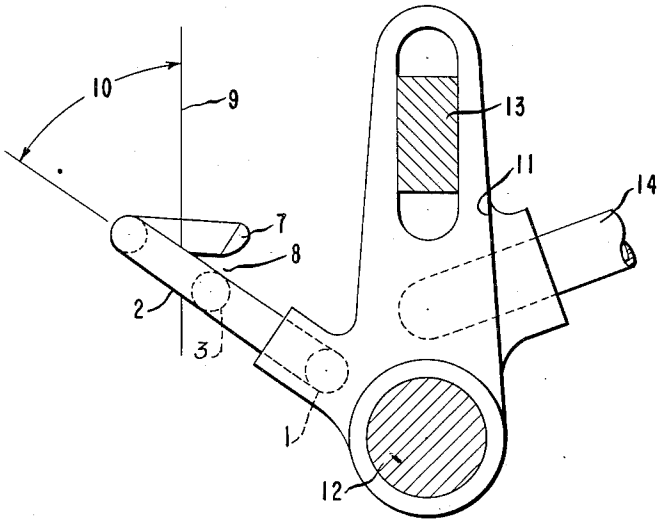


Fig. 2



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TRAVERSE THREAD GUIDE

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This invention relates to the winding of threads and more particularly to a reciprocating thread guide for use in such a winding operation.

In modern textile operations, high speed winding of threads with high frequency reciprocation is required. A thread guide suitable for such winding of bobbins of moderate size is disclosed in U.S. Patent 2,689,694. However, when the same guide is used for larger bobbin sizes, (i.e., larger than about 13 lbs.) the threadline slips out of the guide, resulting in waste of product.

An object of this invention is to provide a traverse guide for high speed winding at high frequency reciprocation.

Another object of this invention is to provide a traverse guide which prevents the thread from slipping out of the desired location due to increasing bobbin size.

Still another object is to provide a guide which is able to intercept and pick up a moving threadline by its own reciprocation within the normal path of the thread, without any manual assistance.

A further object is to provide a guide with positive thread confinement and less critical alignment requirements.

These and other objects will become apparent in the course of the following specification and claims.

In accordance with the present invention, there is provided a self-loading thread guide comprising a supporting base designed for straight line reciprocal motion across a threadline the said supporting base containing two associated surface members in substantially the same plane and protruding from the supporting base and arranged along the line of reciprocation of the supporting base, each of the said surface members protruding outwardly from opposite ends of the said base, the relative rates of protrusion being such that substantially midway along the said base the one surface (a by-pass face) protrudes further from the supporting base than the other said surface (a loading face), a thread retaining circular throat being formed between the two said surfaces by a one turn spiral the tip of which overlaps the said surface forming the loading face, the clearance between the said tip and surface forming a loading slot when a yarn follows the said loading surface by reason of relative motion between the yarn line and the said thread guide. In operation, the two associated surface members are so mounted that there is provided between the plane in which the surface members lie and the yarn line entering the said guide, an angle greater than about 57° and smaller than about 90°.

The invention will be more readily understood by reference to the drawings.

FIGURE 1 is a top view of a preferred embodiment of the yarn guide of the present invention.

FIGURE 2 shows the guide of FIGURE 1 in a typical mounting; the said yarn guide being shown from a side view.

Referring to FIGURE 1, the entire structure of this preferred embodiment is formed from **10**—**10** steel wire and comprises a supporting base **1** from either end of which associated surface members **2** (the by-pass face) and **3** (the loading face) protrude outwardly. At substantially opposite the midpoint of supporting base **1**, surfaces **2** and **3** are joined by a spiral to form throat **4**. This throat is formed by (*a*) a semicircular surface **5** which connects protruding surfaces **2** and **3**, the said surface **5** having its

center of curvature disposed toward loading face **3**, and (*b*) a substantially semicircular retaining surface **6** complementary to semicircular surface **5** to form throat **4**, retaining surface **6** spiraling upward and away from surface **3** and terminating in a blunt tapered end **7** that overlaps surface **3** substantially at its point of junction with surface **5**, and **7** being raised above surface **3** sufficiently to provide a loading slot therebetween.

In FIGURE 2, the yarn guide of FIGURE 1 is shown mounted in a conventional reciprocating yarn guide mounting. The yarn guide is shown with by-pass face **2** toward the viewer, the tapered end **7** spiraling to form loading slot **8**. The continuous threadline is shown at **9** with angle **10** denoting the angle described between the said threadline **9** and the associated surface members. A mounting base and bearing means **11** (preferably nylon) supports the said thread guide and provides reciprocating motion along horizontal rod **12** upon which it is slidably supported, the motion being directed along guide bar **13** and imparted by cam-follower **14** employing a conventional operational mechanism for such reciprocation as described in detail in U. S. Patent 2,689,694.

In operation, the thread guide of the present invention is positioned to provide that angle **10**, as shown in FIGURE 2, will be greater than about 57° and less than about 90°, the line of reciprocation being such that the path of the thread guide will be at substantially 90° to the unconfined threadline and such that during reciprocation threadline **9** will contact protruding surfaces **2** and **3**. When the threadline is contacted by by-pass face **2**, the thread guide merely removes the thread from its path of travel. On the return stroke, however, the threadline follows loading face **3**, enters loading slot **8** and is confined against semicircular surface **5**. Thereafter, the threadline remains confined within throat **4**.

When both the form of the tip end and the relative position of the guide and the thread fulfill the above defined requirements, slipping of the thread out of the desired location is impossible and the thread can be taken out of the confined location only by manual operation or cutting or breaking of the threadline. Moving the yarn into the desired confined location does not require any manual operation and is achieved by the regular reciprocation of the guide in the path of the threadline.

The following example serves to illustrate the advantage gained by employing the guide of the instant invention.

EXAMPLE I

In each of the following four experiments 100,000 pounds of 140 filament nylon yarn of 840 total denier is spun on 13.5 pound bobbins during a one month period. The experiments involve two spinning machines A and B and machine-to-machine differences are eliminated by exchanging the guides after experiments 1 and 2 are completed and before experiments 3 and 4 are started. The failures and defects are reported in Table I. Experiments 2 and 3 are with the thread guide of the present invention. Those of 1 and 4 are a conventional commercial guide as described in U.S. Patent 2,689,694.

Table I

Experiment	1	2	3	4
spinning machine	A	B	A	B
draw twist breaks (per lb. of yarn)	0.004	0.004	0.010	0.010
draw roll wraps (percent)	43.4	39.4	48.7	48.2
broken filament rejects (percent)	8.09	6.79	9.18	10.48
spinning wraps (per 32 positions per day)	4.2	5.1	2.6	4.2

When an attempt is made to wind a 17 pound bobbin using the yarn guide described in U.S. Patent 2,689,694, yarn failures become so numerous that commercial oper-

ation is impossible. In a 14 day period, the yarn guide of the present invention wound 50,000 pounds of the yarn of Example I in 17 pound bobbins with only 0.008 draw twist breaks per pound of yarn and 6.19% broken filament rejections. In a similar run, 22 pound bobbins are produced using the yarn guide of the present invention, yarn defects, etc., being within tolerances satisfactory for commercial operation.

Where the steel wire structure of FIGURE 1 is employed, it is preferred that it be chrome plated to minimize projections, raised areas and non-uniformity of finish. The structural material employed, however, is not critical. Furthermore, surfaces need not be formed from a wire. For instance, they may be the edges of a planar structure protruding from the supporting base. While it is preferred that surfaces **2** and **3** be rounded and curved, such shapes are not critical to the operation of the device. Although the distance of throat **4** from mounting base **11** may vary, it will be obvious from a consideration of FIGURE 2 that the distance must provide for a clearance between threadline **9** and mounting base **11**.

Many equivalent modifications will be obvious to those skilled in the art without departure from the inventive concept.

What is claimed is:

1. A self-loading thread guide comprising a supporting base adapted for straight line reciprocal motion, the said base containing two associated surface members in substantially the same plane and protruding outwardly from the opposite ends of the supporting base and arranged along the line of reciprocation of the supporting base, the

relative rates of protrusion being such that substantially midway along the said base the one surface member which forms a by-pass face, protrudes further from the supporting base than the other said surface member which forms a loading face, a thread retaining circular throat being formed between the two said surface members by a one turn spiral the tip of which overlaps the said surface member forming the loading face, the clearance between the said tip and loading face surface member forming a yarn-line loading slot.

2. The structure of claim 1 wherein the said base and two associated surface members are wire.

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