

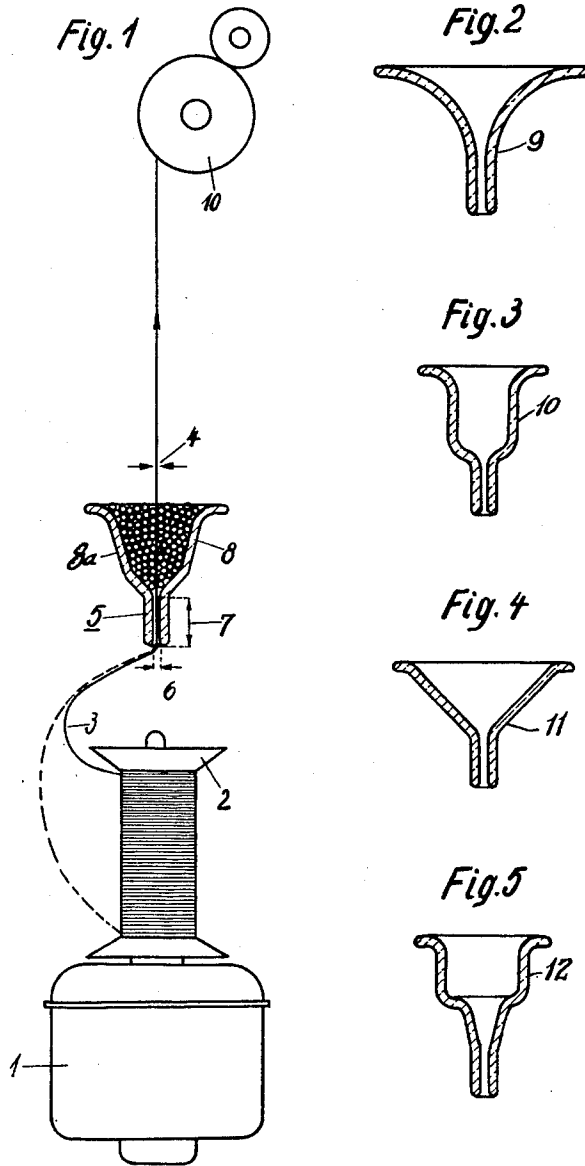
Feb. 28, 1939.

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2,148,996

DEVICE FOR TWISTING TEXTILE THREADS OR THE LIKE.

Filed Feb. 4, 1937



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## UNITED STATES PATENT OFFICE

2,148,996

DEVICE FOR TWISTING TEXTILE THREADS  
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GermanyApplication February 4, 1937, Serial No. 124,000  
In Germany February 7, 1936

3 Claims. (Cl. 117-26)

My invention relates to a device for twisting textile threads or the like.

In the twisting devices hitherto known the thread running off from the twister bobbin is—after the formation of the balloon—as a rule, guided through an open or closed circular thread guide eyelet of porcelain and then runs onto a winding device. The inner diameter of the thread guide eyelet is greater than the thickness of the yarn so that the thread balloon may extend therethrough.

Such a device can be operated at best at speeds of the order of 7,000 R. P. M., if a twisted thread of good quality is to be obtained. Should the device be operated at much higher speeds in order to increase the output, the uniformity of the twisting is considerably impaired. The air resistance to the thread balloon becomes greater in this case and causes an irregular running of the thread with the result that the friction of the thread in the eyelet is varied and, therefore, also the distribution of the twist of the thread between the point where the thread runs off the twister bobbin and the point where the thread runs onto the winding bobbin. When the friction is greater, the thread is twisted only between the point where the thread runs off the twister bobbin and the thread guide eyelet, but in case of smaller friction it is additionally twisted between the eyelet and the point where the thread runs onto the winding bobbin. Furthermore, the devices hitherto known present the disadvantage that the twisted thread breaks very easily not only in the eyelet but also above the same, if otherwise desirable speeds at and above 7,000 R. P. M. are employed.

These drawbacks are removed according to the invention and threads of uniform and satisfactory quality are obtained without breaks or the like by employing, instead of an eyelet of large diameter for guiding the thread above the twister spindle, a nozzle i. e. an element with a narrower guide for the thread than has hitherto been the case and having preferably a particular inner diameter and length with respect to the thickness of the thread running therethrough.

Excellent results have been obtained by nozzles whose smallest diameter is equal to or smaller than ten times the thickness of the thread preferably not smaller than four times the thread diameter and whose height is equal to or greater than ten times the smallest nozzle diameter. In this case the thread may be a single or a twisted thread.

The use of such nozzles permits a very smooth

running of the thread, since the run of the thread is favorably influenced by what may be termed the capillary neck of the air pad entrained by the thread, whereby the thread is guided very smoothly and runs in a uniform manner.

According to the invention the nozzles may be so designed as to have on the inside a cylindrical or slightly conical shape and in the latter case may be additionally so designed that the vertex of the cone points to the twisting spindle and that the thread forming the balloon enters immediately the relatively narrow nozzle neck dimensioned according to the invention. The thread when entering the nozzle is immediately stabilized, i. e., the twist is imparted to the thread practically only between the point where the thread runs off the twister bobbin and the point where it enters the nozzle.

In the accompanying drawing some forms of nozzles according to my invention are shown in diagrammatic form.

Fig. 1 shows a twisting device such as is employed for the manufacture of crape yarns.

Figs. 2 to 5 show particular forms of the nozzle in sectional elevation.

Referring to Fig. 1, 1 denotes the motor for driving the twisting spindle 2, from which the thread 3 to be twisted at the final thickness 4 runs off. It thereby first forms the known balloon and then enters the nozzle 5 whose smallest diameter and height are designated by the numerals 6 and 7 respectively. In this embodiment the nozzle has the form of a cylinder, i. e., its walls are cylindrical for the distance 7 and of a diameter and length with respect to the finished thread diameter stated above, followed by a cup-shaped portion 8 integral with the nozzle. The thread 3 passes from the cup-shaped portion 8 to the winding bobbin 10.

In Figs. 2 to 5 other forms of the cup 8 in Fig. 1 are shown which may be employed for different kinds of yarn as their particular character may require. These cups in Figures 2 through 5 are identified by the numerals 9, 10, 11 and 12 respectively.

The invention is not limited to the embodiment shown; instead of the electric drive 1 any suitable drive such as, for instance, a band pulley drive may be employed.

Further, according to the invention the nozzle may be filled with a material which assists the action caused by the capillary opening. Such a material may be, for instance, a fine grained material, preferably fine grain glass beads 8a or the like, as shown in Fig. 1, which cause a smooth

running of the thread and neutralize any oscillation of the thread which is liable to be set up. I claim as my invention:

5 1. A device for twisting textile yarns or the like at speeds of the order of 7000 R. P. M. and above, having a nozzle-shaped guide for the yarn located between the spinner and the take-up roll, and pointing with the apex of the nozzle toward the spinner, the inner diameter of the  
10 nozzle being not greater than ten times the thickness of the yarn and its length being not shorter than ten times the smallest diameter of the nozzle, whereby an air pad with a capillary neck is entrained in the nozzle by the thread, by which  
15 the smooth guiding of the thread is secured.

20 2. A device for twisting textile yarns or the like at speeds of the order of 7000 R. P. M. and above, having a nozzle-shaped guide for the yarn located between the spinner and the take-up roll, and pointing with the apex of the nozzle toward the spinner, the inner diameter of the nozzle being not greater than ten times and its smallest

inner diameter not smaller than four times the thickness of the yarn and its length being not shorter than ten times the smallest diameter of the nozzle, whereby an air pad with a capillary neck is entrained in the nozzle by the thread, by which the smooth guiding of the thread is secured. 5

3. A device for twisting textile yarns or the like at speeds of the order of 7000 R. P. M. and above, having a nozzle-shaped guide for the yarn located between the spinner and the take-up roll, and pointing with the apex of the nozzle toward the spinner, the inner diameter of the nozzle being not greater than ten times the thickness of the yarn and its length being not shorter than  
10 ten times the smallest diameter of the nozzle, said nozzle having a cup-shaped extension facing in the direction of the yarn travel, and containing fine grain granular material for laterally  
15 steadying the yarn. 20

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