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SYNTHETIC TRAVELER AND RING

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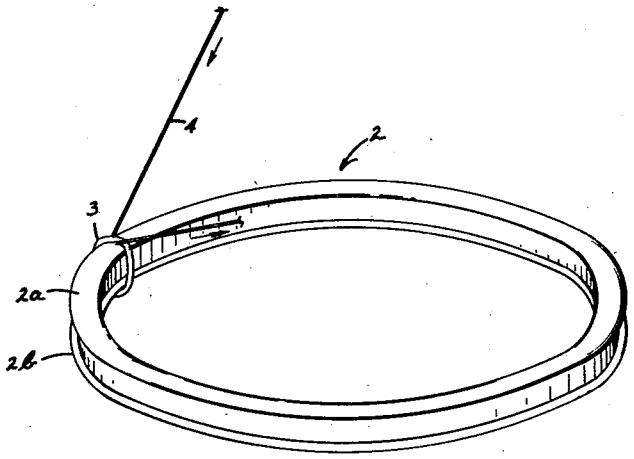


Fig. 1

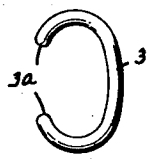


Fig. 2

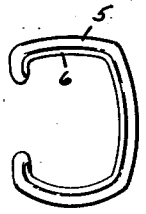


Fig. 4



Fig. 5

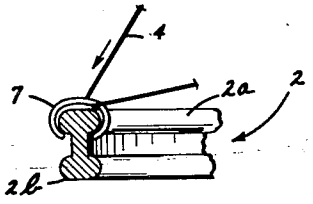


Fig. 3

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SYNTHETIC TRAVELER AND RING

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The present invention relates to travelers which are used on spinning and twisting frames in the textile industry.

In the conventional spinning and twisting mechanism used in the textile industry, the body of fibers being twisted into a yarn or thread passes from the feed rolls to the spindle by way of a small, lightweight guide or traveler freely mounted for rotation about the spindle. In general, these travelers are in the form of small clips which are hooked loosely over the rims of a ring mounted coaxially with the spindle and adapted to be raised and lowered along the length of the spindle to give uniform distribution of the spun material thereon. The rings are usually made of metal being very accurately machined and highly polished to provide smooth, true bearing surfaces against which the traveler may ride as it moves about the spindle during the spinning process.

The travelers have in the past been made of either steel or bronze, the latter being used mostly on wet twisting where the presence of water makes it undesirable to use steel. Due to the high speed rotation of the travelers around the ring and due also to the heavy drag on the traveler in the case of twisting, it is necessary to provide lubrication between the traveler and the ring, such as an oil or grease. Even under conditions of good lubrication, however, wear takes place on the traveler and also on the ring and the fine particles of metal which are worn off become embedded in the grease and are subsequently oxidized and thus form visible stains on the yarns or threads. These stains consist of oxides, carbonates, soaps, etc., of the respective traveler and ring metals, and are very difficult to remove in the ordinary processes of kier-boiling and bleaching.

Many attempts have been made to make travelers of materials, other than steel and bronze, using materials including polymeric resins, hard rubber, and glass. However, these materials have not been satisfactory because of their brittleness and poor resistance to wear.

It is an object of the present invention to provide a traveler made of synthetic sapphire which has a longer life than travelers used heretofore.

Another object of the invention is to provide a traveler made of Bakelite which has inserts of synthetic sapphire at its wearing points.

Another object of the invention is to provide a metallic traveler having inserts of synthetic sapphire at its wearing points.

Another object of the invention is to provide a synthetic sapphire traveler mounted on a ring the

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portions of which are in contact with the traveler also being made of sapphire.

Another object of the invention is to provide a traveler which obviates the use of a lubricant between it and the ring on which it is mounted.

Another object of the present invention is to provide a traveler on a ring twister which does not contaminate the yarn or thread with which it comes in contact.

Another object of the invention is to provide a traveler which is resistant to corrosion and which may safely be employed in wet twisting.

Other objects and advantages of the present invention will be obvious from the description thereof hereinafter.

In connection with the following description of the invention, reference should be had to the accompanying drawing in which

Figure 1 is a perspective view of a traveler, produced in accordance with the present invention, mounted on a ring,

Figure 2 is a view of the traveler shown in Figure 1,

Figure 3 is a view, partly in section, showing another type traveler,

Figure 4 is a view of a traveler which is representative of another embodiment of the invention, and

Figure 5 is a cross section view of the traveler shown in Figure 4.

In accordance with the generic aspect of this invention, travelers and/or rings are made from synthetic sapphire. In Figure 1, there is shown a ring 2 having a freely movable synthetic sapphire traveler 3 mounted thereon under which the yarn or thread 4 passes as shown. The traveler 3 is shown more clearly in Figure 2.

When the prongs or hooked portions 3*a* of traveler 3 are not too long, the traveler may be snapped onto the ring 2. However, when the hooked portions are so large that snapping of the ring in place becomes impossible, the ring may be split so that the traveler may be placed on the ring through the gap in the periphery of the ring formed by spreading the ends of the ring apart. While in use, means are provided for forcing the ends of the ring together to form a substantially continuous closed ring. The split ring is clearly shown and described in U. S. Patent 2,367,361.

The ring 2 may be made of steel or other metal or it also may be made in whole or in part of synthetic sapphire. It is only necessary, however, that the rounded top and bottom surfaces 2*a* and 2*b*, with which the ring comes in contact, be made of synthetic sapphire.

In Figures 4 and 5 there is shown another type

traveler which comprises an outer covering or shell 5 about the synthetic sapphire 6 which forms the inner surface of the traveler that comes in contact with the ring. The portion 5 may just clamp over the sapphire 6 or the latter may be inserted into a groove in the curved bar 5 and held in place by means of a suitable cement or glue. The outer covering or shell 5 may be formed from metal, such as steel, or may be formed or molded from Bakelite.

Figure 3 depicts still another type of traveler 7 which encircles only the upper rounded portion of the ring 2. Here again the upper and lower surfaces 2*a* and 2*b* may be made of synthetic sapphire or the whole ring may be so made. However, since in this embodiment only the top surface 2*a* comes in contact with the traveler 7, it is all that need be made of synthetic sapphire if desired. Of course, when the hooked portions of the travelers shown in Figures 3, 4, and 5 are of such magnitude that the travelers are not easily snapped onto the rings, a split ring, such as hereinbefore described, should be employed.

The employment of synthetic sapphire in making travelers and rings is a definite improvement over the use of steel or glass since the sapphire is harder than steel and in addition is less brittle than glass. Synthetic white sapphire is a single homogeneous hexagonal crystal of aluminum oxide or corundum which can be given an exceptionally smooth surface. Due to its hardness, it is extremely wear resistant. Synthetic sapphire can be fashioned into travelers and rings when worked by the conventional fabricating methods such as sawing, grinding and polishing, drilling, flame-bending, flame-shaping, etc. A smoother surface can be imparted to the synthetic sapphire by first firing and then grinding the same.

Due to the highly polished and smooth surface that is possible on synthetic sapphire, no lubrication is necessary when a traveler and/or a ring formed from the same is employed. Further, the highly polished surfaces of synthetic sapphire travelers and/or rings resist the accumulation of lint.

Extremely abrasive fibers traveling at high speeds, cut grooves in ordinary travelers which fray the threads to the breaking point which also results in loss of material because long before the thread breaks, it is sufficiently damaged to have produced miles of defective fibers. Synthetic sapphire travelers resist the abrasive action of fibers and outwear metal, glass, or porcelain travelers many times. Thus a great saving is realized by employing travelers of the present invention.

It is, of course, advantageous to have both the ring and traveler made of synthetic sapphire since there is a great saving due to less wear on the ring surface and no lubrication is needed which in turn eliminates the danger of contaminating the thread or yarn.

It is to be understood that changes and variations may be made without departing from the spirit and scope of the invention as defined in the appended claims.

I claim:

1. As an article of manufacture, a traveler for a ring twister comprising a supporting body, an insert on the inner periphery thereof, said insert being the wearing surface of the traveler and composed of synthetic sapphire.

2. An article of manufacture as defined in claim 1 wherein the supporting body is a metallic supporting body.

3. An article of manufacture as defined in claim 1 wherein the supporting body is a steel supporting body.

4. An article of manufacture as defined in claim 1 wherein the supporting body is a Bakelite supporting body.

5. In a device for spinning and twisting yarns and threads, the combination of a ring composed of synthetic sapphire and a traveler composed of synthetic sapphire, said traveler being movably mounted on the ring.

6. In a device for spinning and twisting yarns and threads, the combination of a ring having top and bottom surfaces composed of synthetic sapphire and a traveler composed of synthetic sapphire, said traveler being movably mounted on the ring in contact with both the top and bottom surfaces thereof.

7. In a device for spinning and twisting yarns and threads, the combination of a ring having a top surface composed of synthetic sapphire and a traveler composed of synthetic sapphire, said traveler being movably mounted on the ring in contact with only the top surface thereof.

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