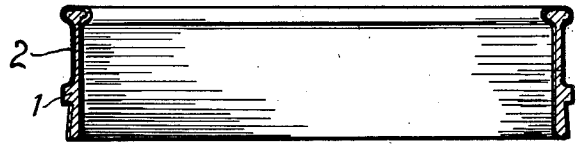
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SPINNING RING

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SPINNING RING

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The present invention relates to an improved spinning ring.

Travelers which are used on spinning and twisting frames in the textile industry have been improved by making them of materials other than metal, for example, of high polymer substances such as super polyamides and substances based on synthetic resin. These travelers have been used in combination with conventional spinning rings which are usually made of tempered steel.

The object of the present invention resides in the provision of a spinning ring which is better suited for the new travelers than conventional spinning rings and which permits traveler and spinning speeds which could not be realized in the past.

Systematic tests have shown that spinning rings used with conventional travelers and answering conventional requirements are insufficient when using travelers made of synthetic material without lubrication between ring and traveler. Whereas hitherto a ring having utmost mechanical hardness, i. e. having a hardness defined according to Vickers of 750 to 900 kg./mm.^{2}, was considered best, such hardness ranks only second in importance if the ring is used with the new travelers. Other factors which heretofore have had little or no consideration, however, have a decisive effect.

The new travelers are very sensitive to heat which is transferred by radiation and conduction. The materials of which the new travelers are made are very poor conductors of heat, so that heat reception and direct heat transfer to the environment is negligible. To prevent damage to the traveler, the total heat generated by friction must be removed quickly and directly in a suitable manner. This is particularly necessary because, contrary to the traditional concept, the coefficient of friction and therefore the generated frictional heat is greater between the synthetic materials of which the new travelers are made and steel than between steel and steel.

The tests have also shown that certain non-metallic ring surface layers considerably reduce the friction when using non-metallic travelers and improve sliding conditions relative to metallic ring surfaces. This contributes essentially to obtaining the improved conditions which are an object of the present invention. The spinning ring according to the invention is provided with a non-metallic surface which, in addition to the production of the aforesaid improved condition, prevents covering of the running surfaces of the ring with particles abraded from the new travelers. Abrading of the travelers is caused by the heterogeneous metallic character of conventional rings and impairs running smoothness of the traveler.

The spinning ring according to the invention answers the requirements of the new travelers because it is made of a non-ferrous metallic base material, preferably based on aluminum, whose specific heat conductivity is greater than 0.25 cal./cm. sec. ° C. and whose surface is covered by a non-metallic coating. Preferred are hard aluminum alloys, for example, an alloy known as Anticorodal and

other hardenable aluminum alloys which are free of copper, the ring made of such alloys being preferably anodically oxidized. Instead of aluminum alloys mechanically cold hardened pure aluminum or suitable magnesium alloys may be used.

The heat conductivity of a spinning ring made of an aluminum base material in accordance with the generic aspect of this invention is approximately 0.3 cal./cm. sec. ° C., i. e. about three times as great as that of conventional hardened steel rings whose coefficient of heat conductivity is approximately 0.09 cal./cm. sec. ° C., varying from 0.03 cal./cm. sec. ° C. if the steel is alloyed to 0.17 cal./cm. sec. ° C. if pure iron is used. A ring made according to the invention is therefore capable of absorbing the heat generated by friction from the contact surfaces of ring and traveler and of conducting the heat quickly and effectively into the interior of the ring and eventually to the ring rail. This is of fundamental importance, because travelers made of thermoplastic materials, as well as of thermo-hardenable materials, are extremely sensitive to heat. The heat load on such travelers is substantially reduced if they are used on rings according to this invention, permitting a substantial increase of traveler and spinning speed.

The spinning rings according to the invention are preferably provided with a homogeneous and non-metallic running surface. The surfaces of spinning rings made of aluminum and aluminum alloys may be provided with layers of Eloxal, i. e. aluminum oxide, which can be produced anodically or chemically without difficulty and undue expense. Such surface layers have a Vickers or diamond pyramid hardness of 400 kg./mm.^{2} compared with the surface hardness of 40 to 180 kg./mm.^{2} of the relatively soft aluminum ring; the hardness of the surface layer, however, is not as great as that of conventional steel rings. Rings made of aluminum or aluminum alloys and surfaced according to the invention are characterized by an extraordinary constancy of friction over the whole ring circumference and by an extraordinarily long life. The running surfaces of rings according to the invention are not covered with synthetic material abraded from the travelers, in contradistinction to pure metallic surfaces, and operate much more smoothly.

The one figure of the drawing forming part of this specification is a transverse section of a spinning ring according to the invention.

The spinning ring consists of a non-ferrous metal **1** having a specific heat conductivity greater than 0.25 cal./cm. sec. ° C., the metal **1** having a non-metallic surface coating **2** which may be an oxide of the non-ferrous metal.

The spinning rings according to the invention, if used in combination with plastic travelers, permit a substantially increased spinning speed with negligible wear of the ring and a life of the traveler which hitherto could not be realized. They are not only excellently suited for dry friction but also for wet friction between ring and traveler because the new rings are corrosion-proof and can be used on doubling and twisting frames with water lubrication.

While I believe the above described embodiments of my invention to be preferred embodiments, I wish it to be understood that I do not desire to be limited to the exact details of the method and product described, for obvious modifications will occur to a person skilled in the art.

I claim:

1. A spinning ring particularly adapted to support a traveler made of high polymer substances, the ring being made of non-ferrous metal having a specific heat conductivity greater than 0.25 cal./cm. sec. ° C. and having a non-metallic surface coating.

2. A spinning ring according to claim 1, said non-ferrous metal having an aluminum base.

3. A spinning ring made of an aluminum alloy whose specific heat conductivity is greater than 0.25 cal./cm. sec. ° C. and having a non-metallic surface coating.

4. A spinning ring made of a magnesium alloy whose specific heat conductivity is greater than 0.25 cal./cm. sec. ° C. and having a non-metallic surface coating.

References Cited in the file of this patent

UNITED STATES PATENTS

273,090	Husband	Feb. 27, 1883
580,411	Laurency	Apr. 13, 1897
717,748	Ivon	Jan. 6, 1903
1,065,704	Mershon	June 24, 1913
1,399,418	Whitehead	Dec. 6, 1921
1,595,858	Crompton	Aug. 10, 1926
2,157,155	Work	May 9, 1939
2,194,930	Feen	Mar. 26, 1940
2,618,116	Albrecht	Nov. 18, 1952

FOREIGN PATENTS

621,163	Great Britain	Apr. 5, 1949