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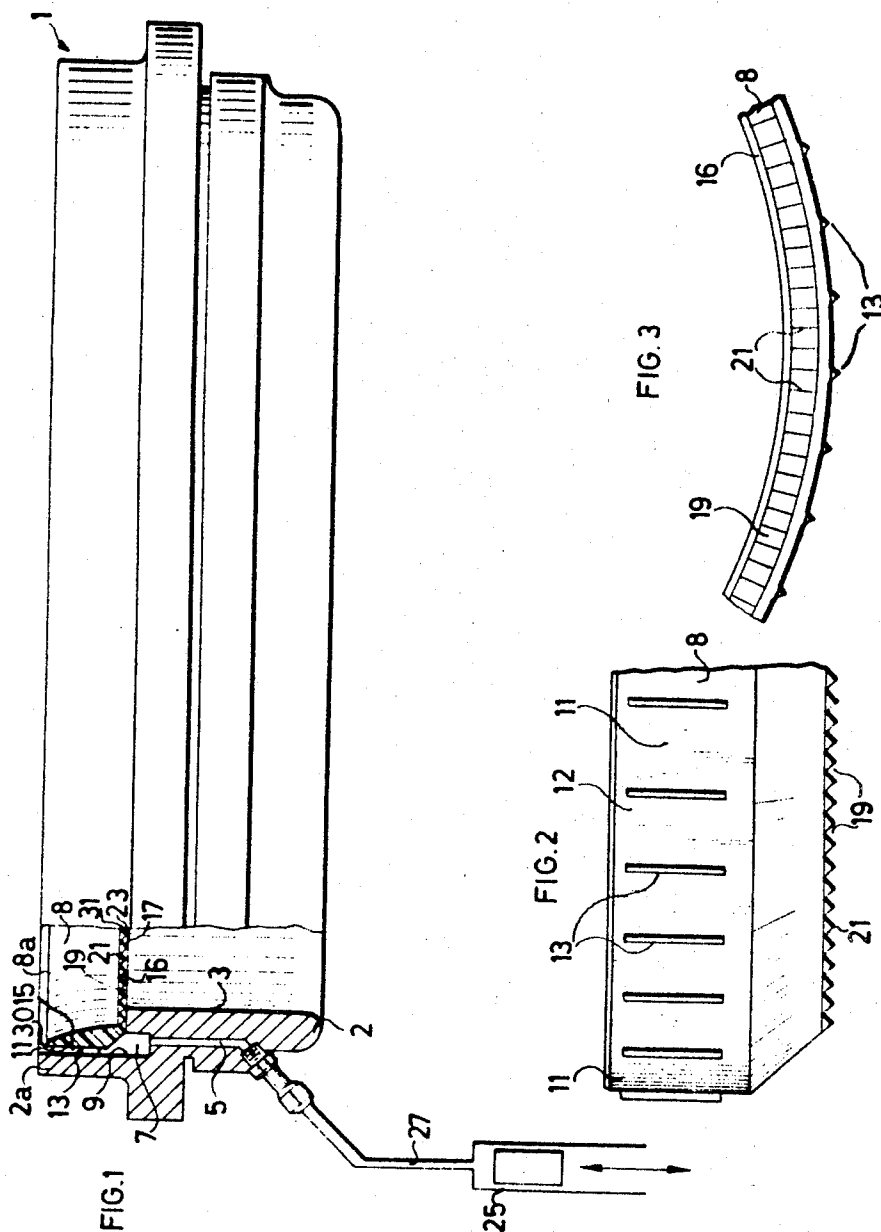
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3,447,304

LUBRICATED SPINNING RING

Filed Nov. 15, 1967

Sheet 1 of 2



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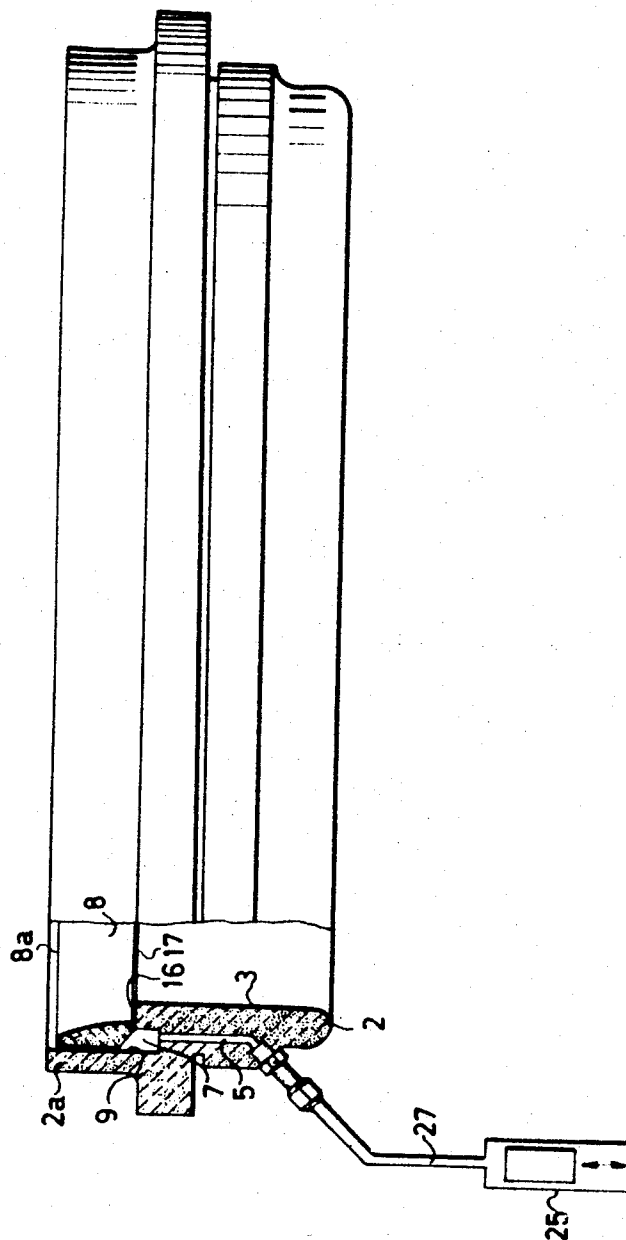
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FIG. 4



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LUBRICATED SPINNING RING

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9 Claims

ABSTRACT OF THE DISCLOSURE

A spinning ring is made of two rings which form between each other an annular cavity to which a lubricating fluid is supplied and which communicates through an annular row of narrow flow passages with the running surface of the spinning ring on which the travellers run.

Background of the invention

The present invention relates to a spinning ring around which travellers slide during spinning of a roving into a yarn. Due to the high speed of the travellers, which is in the range of 50 m./sec., it is essential that the running surface of the spinning ring is lubricated sufficiently to reduce friction to a minimum and to protect the running surfaces of the spinning ring and travellers against wear.

In accordance with the prior art, wick lubrication has been mainly used, which has the disadvantage that the lubrication becomes uneven when the wicks are soiled.

It is also known to provide a central lubricating system for a great number of spinning rings, which is uneconomical since every spinning ring has to be provided with a precision metering valve accomplishing the supply of the same amount of lubricating fluid to each spinning ring, irrespective of its distance from the central lubricating pump.

The lubricated spinning rings according to the prior art have the disadvantage that the lubricating fluid is not supplied along the entire circular running surface so that the travellers have to distribute the supplied lubricating fluid over the entire annular running surface whereby complete uniformity of the lubricating film is not assured.

Summary of the invention

It is one object of the invention to improve known lubricating arrangements for spinning rings, and to provide a lubricated spinning ring whose construction assures a uniform and sufficient lubrication of the entire running surface or track around which the travellers slide.

Another object of the invention is to provide a perfectly lubricated spinning ring of simple construction which can be economically manufactured.

With these objects in view, a lubricated spinning ring according to one embodiment of the invention comprises a first ring having an inlet means for a lubricating fluid under pressure which may be supplied by a measuring pump, and a second ring coaxial with the first ring and secured to the same. The first and second rings form an annular cavity communicating with one or several inlets in the first ring so that the cavity is filled with lubricating fluid under pressure. The first and second rings form passage means for connecting the annular cavity with an annular outer running surface or track of at least one of the rings.

In the preferred embodiment of the invention, one of the rings has ridges abutting the other ring and forming flow channels located in radial planes passing through the common axis of the rings and having inlet ends communicating with the annular cavity and outlet ends for supplying the lubricating fluid to the annular running surface.

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In a modified embodiment, the inner ring is made of a fluid permeable sinter metal having pores forming flow passages therethrough so that a lubricating fluid flows from the annular cavity through the sinter metal to the running surface on which the travellers slide.

The novel features which are considered as characteristic for the invention are set forth in particular in the appended claims. The invention itself, however, both as to its construction and its method of operation, together with additional objects and advantages thereof, will be best understood from the following description of specific embodiments when read in connection with the accompanying drawing.

Brief description of the drawing

FIG. 1 is an elevation, partially in axial section, illustrating an embodiment of the invention;

FIG. 2 is a fragmentary elevation illustrating a part of the embodiment of FIG. 1 on an enlarged scale;

FIG. 3 is a fragmentary bottom view of the part illustrated in FIG. 2; and

FIG. 4 is an elevation, partially in axial section, illustrating a modified embodiment of the invention.

Description of the preferred embodiments

The spinning ring 1 illustrated in FIG. 1 consists of a first main ring 2 and a second inserted ring 8. Rings 2 and 8 have a common axis and are circular.

The inner cylindrical surface 3 of ring 2 has a smaller diameter than the inner surface of ring 8, and the annular portion 2a is higher in axial direction than the top surface 8a of ring 8 so that a traveller sliding on the running surfaces of ring 2 will not be in contact with ring 8.

Ring 2 has at least one inlet 5, and preferably a plurality of inlets 5 uniformly spaced in circumferential direction about ring 2. Inlets 5 form axially extending conduits communicating with an annular cavity 7 formed between rings 2 and 8, and comprising an annular groove of rectangular cross section provided in ring 2.

Annular portion 2a of ring 2 has an inner annular surface 9 which is cylindrical or frusto-conical tapering downward.

Ring 8 has an outer cylindrical surface formed with axially extending ridges 13, best seen in FIG. 2 which abut the inner surface 9 with pressure so that ring 8 is secured to ring 2. The surface portions 11 between two adjacent ridges 13 form with the respective confronting portions of the inner surface 9, an annular row of axially extending flow passages or channels 15 located in radial planes passing through the common axis of rings 2 and 8. The flow passages have inlet ends communicating with the annular cavity 7, and outer ends communicating with the running surface of annular portion 2a.

Ridges 13 do not extend to the top face of ring 8, but as best seen in FIGS. 1 and 2, an annular smooth surface 12 of ring 8 directly confronts the uppermost smooth annular portion of cylindrical surface 9 forming an annular gap 30 with the same through which lubricating fluid flows onto the running surface on annular portion 2a.

The annular bottom face of ring 8 has ridges 21 separated by notches 19, and ring 8 is pressed into a position in which the extremities of the ridges 21 abut the annular surface 17 of the lower portion of ring 2. Ridges 21 and notches 19 are located in radial planes passing through the common axis of rings 2 and 8, and notches 19 form with the horizontal annular surface 17 of ring 2 a second set of flow passages or channels 23 whose inlet ends communicate with annular cavity 7. The outlet ends of flow passages 23 do not directly open on inner surface 3, since, as best seen in FIG. 3, an annular horizontal

bottom surface 16 is provided on ring 8 between its inner surface and the inner end of ridges 21. The annular smooth surface 16 confronts a smooth annular surface portion of surface 17 of ring 2 and forms an annular gap 31 with the same through which lubricating fluid passes to the inner cylindrical surface 3 of ring 2.

At least one inlet 5 is connected by a conduit 27 to a metering pump 25 which during each piston stroke dispenses an exactly measured amount of lubricating oil through conduit 27 and inlet 5 into the annular cavity 7. The pressure at which the lubricating fluid is supplied is selected in accordance with the prevailing operational conditions, and depends on the amount of lubricating fluid which is to be applied to the running surfaces of the spinning ring within a given time.

The annular cavity 7 serves as a reservoir for the lubricating fluid, preferably oil, and has such a volume as compared with the flow cross sections of the flow passages 15 and 23 that both sets of flow passages are uniformly supplied with the lubricating fluid, even if only one inlet conduit 5 is provided. In other words, the flow of the lubricating fluid in the annular cavity 7 is so slow that practically the same pressure prevails everywhere in the annular cavity 7. The flow passages 15, formed between surface 9 and recessed portions 11, and flow passages 23, formed between surface 17 and notches 19, may be of different length and/or width, and depending on the type of spinning operation and the consequent position of the travellers on the spinning ring, the travellers take the lubricating liquid either out of both annular gaps 30 and 31, or only out of one of the same.

The spinning ring may be made of steel covered by a copper coating which is particularly satisfactory if the travellers consist of a synthetic plastic material. However, in the embodiment of FIG. 1, the inserted ring 8 is made of a synthetic plastic material which is possible since ring 8 is not engaged by the traveller due to the fact that portion 2a is higher than the top surface of ring 8, and surface 3 has a smaller diameter than the inner surface of ring 8.

In a modified embodiment, according to FIG. 4, the spinning ring is constructed substantially as described with reference to FIG. 1, with an inlet or inlets 5 opening into an annular cavity 7 formed between a pair of rings 2, 8. However, the ring surfaces abut each other and close the annular cavity 7 completely. Since both rings 2 and 8, or only one of the same, are in this embodiment constructed of a fluid permeable sinter metal mainly of sintered iron dust whose pores form flow passages therethrough, the lubricating liquid passes from annular cavity 7 through the sinter metal rings onto the running surfaces so that the track of the travellers is lubricated by a film of lubricating oil.

It is desired that the lubricating oil does not flow onto the entire outer surface of the spinning ring, but only to the running surfaces, in accordance with the invention, bands or inserts are provided for covering the surfaces of the spinning ring which do not require lubrication, or the pores of the sinter metal may be closed on the respective surface portions by a layer of a plastic material, or by a suitable surface treatment which closes the pores at the surface at which no lubricating oil is to flow.

The pressure in the annular cavity 7 is determined in accordance with the size of the pores of the sinter metal forming the flow passages, and also depending on the type of traveller, the used yarn and the method and speed of operation. The adjustment of the pressure may be obtained by providing a main reservoir at a suitable height above the spinning rings into which the lubricating oil is pumped, or by adjusting the pump or a centrally located throttle valve by which the volume of supplied lubricating liquid is determined.

It will be understood that each of the elements described above, or two or more together, may also find a useful

application in other types of lubricated spinning rings differing from the types described above.

While the invention has been illustrated and described as embodied in a lubricated spinning ring consisting of two rings forming an annular cavity communicating through flow passages with the running surfaces of the spinning ring, it is not intended to be limited to the details shown, since various modifications and structural changes may be made without departing in any way from the spirit of the present invention.

Without further analysis, the foregoing will so fully reveal the gist of the present invention that others can by applying current knowledge readily adapt it for various applications without omitting features that, from the standpoint of prior art, fairly constitute essential characteristics of the generic or specific aspects of this invention.

What is claimed as new and desired to be protected by Letters Patent is set forth in the appended claims:

1. Lubricated spinning ring comprising, in combination, a first ring means having inlet means for a lubricating fluid; and a second ring means coaxial with said first ring means and secured to the same, at least one of said first and second ring means having at least one running surface, said first and second ring means forming between each other an annular cavity and a plurality of flow channels including at least one annular row of narrow flow channels closely spaced in circumferential direction, said flow channels having inlet ends opening into said cavity and open outlet ends located between said first and second ring means and spaced along said annular running surface so that lubricating fluid is supplied to said annular running surface through said open outlet ends of said flow channels.

2. Lubricating spinning ring as claimed in claim 1 wherein said flow channels are straight and located in radial planes passing through the axis of said first and second ring means.

3. Spinning ring as claimed in claim 1 wherein said first and second ring means have confronting smooth annular surfaces forming at least one annular gap between said outlet ends of said flow channels and said annular running surface.

4. Spinning ring as claimed in claim 1 wherein said plurality of flow channels includes a first set of flow channels located between confronting substantially cylindrical surfaces of said first and second ring means; and a second set of flow channels located between confronting annular surfaces of said first and second ring means in a plane perpendicular to the axis of said ring means.

5. Spinning ring as claimed in claim 4 wherein said first and second ring means have two pairs of confronting smooth annular surfaces forming a first cylindrical gap and a second annular gap located in said plane, respectively, said first and second annular gaps being located between said annular running surface and said outlet ends of said flow channels of said first and second sets of flow channels respectively.

6. Spinning ring as claimed in claim 5 wherein said first flow channels and first annular gap have a total flow cross section smaller than the total flow cross section of said second flow channels and said second annular gap.

7. Spinning ring as claimed in claim 1 wherein said second ring means is located within said first ring means and has circumferentially spaced ridges located in radial planes passing through the axis of said ring means and abutting said first ring means for forming between each other and said first ring means said flow channels.

8. Spinning ring as claimed in claim 1 wherein said second ring means is located within said first ring means; and wherein said first ring means has an inner annular portion having a smaller inner diameter than said second ring means and forming a first annular running surface, and also has an annular portion higher in axial direction

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than said second ring means and forming a second annular running surface so that a traveler running on said first and second running surfaces does not slide on said second ring means.

9. Spinning ring as claimed in claim 8 wherein said first ring means is made of metal; and wherein said second ring means is made of a synthetic plastic material resiliently fitting into the same.

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