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LUBRICANT PAD FOR BEARINGS

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Fig 1

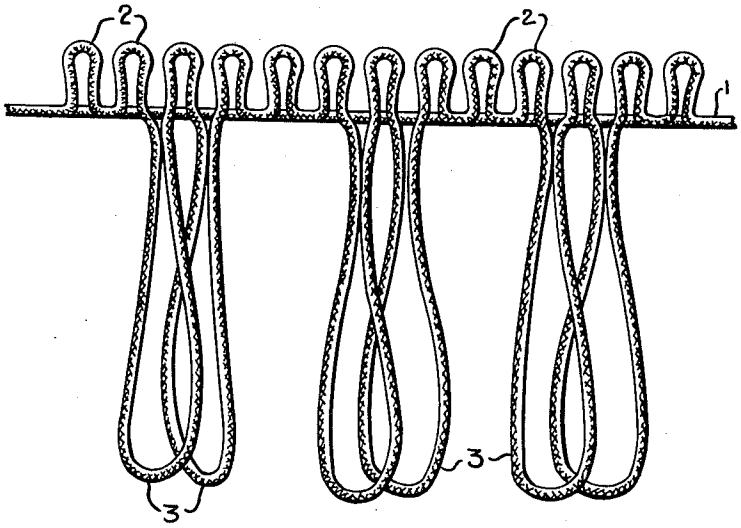
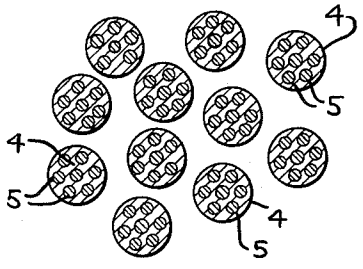


Fig 2



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LUBRICANT PAD FOR BEARINGS

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7 Claims. (Cl. 308—243)

My present invention relates to improvements in capillary action textile lubricant pads for bearings, in particular for railway car journals; and the main object of my improvements is to continuously and uniformly also incorporate into the contact surface such lubricants which cannot be supplied through capillary action, without, however, impairing the capillary-action oil supply.

The bearings of railway car journals often comprise an upper brass against which the journals are pressed through the weight of the vehicle and a lubricant pad which contacts the journal from below. The said pad comprises a textile strand structure and a wire support therefor, and is spring-pressed against the journal. On the side adjacent the journal, the threads are woven loop-like into the pad, while at the bottom side the threads are immersed in form of wicks in the oil chamber. The said wicks suck oil up into the fabric loops or thread nooses which, by virtue of the spring pressure, contact and oil the axle journal. A requirement for such action is, however, that the axle-journal surfaces are of high and uniform smoothness, without hair cracks and the like.

In power-vehicle motors and gears, the use of "graphited" oils has proved of value. Graphite, as is well known in the art, is capable of smoothing out minor rough spots in bearing surfaces and increasing the lubricating capacity of the oil. Through the use of oils containing graphite in colloidal dispersion, the operating properties of the bearings and, thus, the safety of operation are substantially improved. The use of such oils, however, is impossible in those cases in which wicks are used, since the latter although capable of adsorbing the oil, are not capable of feeding the colloidal graphite to the point of lubrication. It has not been possible, therefore, up to now to exploit the advantages afforded through the use of graphited oil.

It has been attempted to coat the threads of lubricant pads with graphite, as is done, e. g., in the case of stuffing-box packings, but the results were disappointing, since the graphite tends to plug the capillaries. It thus has not been possible, up to the present, to satisfactorily feed graphite to axle-journals of the type indicated.

According to my present invention, the threads contacting the axle-journal surface consist, partly at least, of artificial fibres in which lubricant particles are stored or embodied. In one example, all the threads contacting the journal consist of single fibres in which are embodied minute particles of a lubricant, preferably distributed uniformly over the entire fibre cross-section. In another example, the said fibres are present in the loop in company with other natural or artificial fibres. In any case, it is of essence that lubricant particles are embodied in at least part of the threads in the sections in which they contact the axle-journal. With a view of simplifying the manufacture of the pad, the wicks which are immersed in the oil, may be made of the same fibres as the thread loops.

By embodying in the fibrous mass solid lubricants or, again, liquid lubricants which cannot be fed through capillary action to the axle journals, these lubricants still can be supplied to the contact face. It thus is possible to utilize the favorable action of solid materials such as graphite, talcum, or of highly viscous oils and fats.

Artificial fibres made from solutions having a basis of cellulose, such as may be made e. g. according to the viscose process or the cuprammonium silk process, are best suited for the purpose of my present invention, the finely dispersed lubricant being incorporated in the spinning solution and anchored by virtue of the spinning process in the fibres uniformly distributed across the entire fibre cross-section.

In order to understand clearly this invention an example is illustrated in the accompanying drawing, in which

Fig. 1 shows a sectional view of a lubricant pad constructed according to this invention, and

Fig. 2 illustrates a cross section through a number of particular fibers.

Fig. 1 shows a tissue or cloth 1 into which threads 2 are woven or sewed. The threads form loops on the upper part of the tissue 1. Below the cloth 1 are provided threads 3 which act as wicks.

The pad is fastened to a frame (not shown). In the interest of better clarity only a few of the threads 3 are shown in the drawing.

According to this invention the fibers of the threads 2 are made artificially and particles of lubricants are incorporated into the particular fibers.

Fig. 2 illustrates a cross-section through a number of particular fibers 4 of the threads 2. It is shown, how the particles 5 of lubricant are incorporated into the fibers.

It is not necessary that lubricant particles be incorporated also into the fibers of the threads 3, although in order to have a simpler fabrication of the pad, threads 2 and 3 may consist of the same material.

The threads 3 hanging from the tissue 1 reach into an oil container and oil is supplied by capillary action to the threads 2, which are in contact with the part to be lubricated, for instance a journal of an axle. If by friction between the threads 2 and the moving part to be lubricated the fibers of the thread gradually wear out, the lubricant incorporated therein is set free and takes part in the lubrication process.

The quantity of incorporated lubricant may vary in wide limits. The upper limit is defined by the requisite rubbing strength and stability of the fibre, which depends on one hand on the nature of the bearing stress and, on the other hand, on the combined use of fibres having no incorporations. In general, lubricant contents from 10 to 80 percent by weight of the entire fiber mass have proved useful, figured for the impregnated fiber and not considering eventual other fibers used in combination therewith.

According to one example of my present invention, there may be provided, aside from the artificial fibres impregnated with graphite, talcum or the like, also artificial fibres impregnated with another lubricant, finely dispersed therein, such as fats or oils. The latter preferably shall have a higher boiling point and flash point than, for instance, the oils which are fed by capillary action through the wicks to the contact surfaces.

A preferred example of such latter combination comprises, in addition to the solid lubricant, fat or oil embodied in the same fiber.

In use, as already stated above the pads according to my present invention continuously provide lubricant for the contact surfaces, in addition to the oil fed through the wicks by capillary action, owing to a slight rubbing wear of the fibers. The result of such additional lubrication is a substantial improvement of the lubricating property of the sucked-up oil. It has to be further noted that the fibers used for the pad according to my present invention, in contradistinction with pads of prior art, shall have a stability as high as possible, i. e. the fibres shall oppose as much as possible a smoothing and felting on the contact surface due to friction under the pressure of the contact spring. It has been found that the fiber which contains solids substantially maintains its initial shaped despite the pressing and friction, and thus is more suitable for feeding oil to the contact faces than the fibers used up to the present time. The stability of the fibers according to my present invention can be attributed to the large quantity of embodied solids on one hand, and may be further enhanced by an appropriate process of manufacture.

The oil output of the wick, i. e. the feed of oil to the axle journal, is not impaired by the incorporations in the fiber. On the contrary, in comparison with the

natural fibres used in prior art, such output can be substantially increased by using fibers of small single standard or fineness, whereby the number of capillaries is increased.

When, owing to lack of oil, soiling and the like, the temperature of the bearing is raised above its normal temperature of operation, the fiber mass is destroyed, and relatively large quantities of the embodied lubricants are set free. The operating properties thereby are improved in such degree, also at these higher bearing temperatures, as to prevent in most cases further overheating and seizing of the bearings. Tests of lubricating pads according to my present invention, have shown that they are substantially more reliable in operation than pads of prior art.

What I claim as new and desire to secure by Letters Patent, is:

1. A lubricant textile material for bearings, comprising, in combination, elongated threads each thread being formed of a plurality of fibers and having first portions adapted to contact the surface to be lubricated and second portions adapted to be immersed in a bath of liquid lubricant so that liquid lubricant may be carried to said first portions by capillary action; at least some of said fibers consisting of a composition of synthetic substance and particles of a lubricating substance embedded therein, so that upon disintegration of the synthetic substance forming part of said fiber the lubricating substance embedded therein is freed for lubricating action.

2. A lubricant textile material for bearings, comprising, in combination, a plurality of elongated yarns each composed of individual fibers; at least some of said fibers consisting of a composition of a synthetic substance and particles of a lubricating substance embedded therein, so that upon disintegration of the synthetic substance forming part of said fiber the lubricating substance embedded therein is freed for lubricating action, said yarns having the fibers thereof arranged forming interstices between themselves and having a first portion adapted to contact the surface to be lubricated and a second portion adapted to be immersed in a bath of liquid lubricant, so that liquid lubricant may be carried to said first portions of said yarns by capillary action in the intersticed space between the fibers.

3. A lubricant textile material for bearings, comprising, in combination, elongated threads each thread being formed of a plurality of fibers and having first portions adapted to contact the surface to be lubricated and second portions adapted to be immersed in a bath of liquid lubricant so that liquid lubricant may be carried to said first portions by capillary action; at least some of said fibers consisting of a composition of synthetic substance and particles of a lubricating substance embedded therein, so that upon disintegration of the synthetic substance forming part of said fiber the lubricating substance embedded therein is freed for lubricating action, said particles of lubricating substance having a higher boiling point and flash point than said liquid lubricant in said bath.

4. A lubricant textile material as defined in claim 1, wherein said lubricating substance is graphite.

5. A lubricant textile material as defined in claim 1, wherein said lubricating substance is talcum.

6. A lubricant textile material as defined in claim 1, wherein said lubricating substance is a highly viscous oil.

7. A lubricant textile material as defined in claim 1, wherein said synthetic substance is a synthetic cellulose base substance.

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