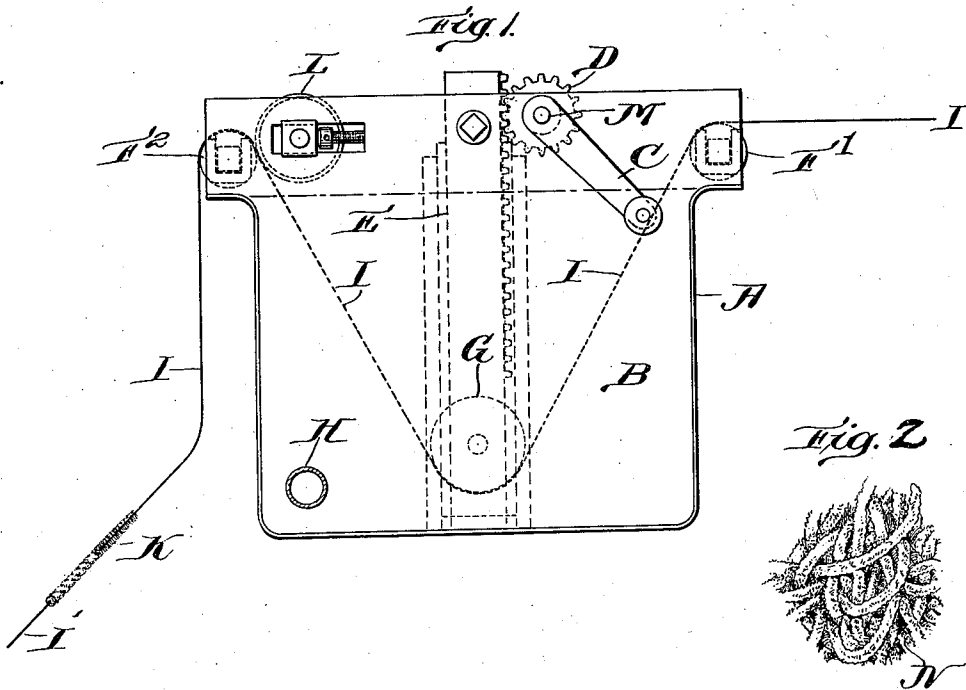


W. H. DRURY.
LUBRICATING PACKING.
APPLICATION FILED MAY 1, 1911.

1,015,727.

Patented Jan. 23, 1912.



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LUBRICATING-PACKING.

1,015,727.

Specification of Letters Patent.

Patented Jan. 23, 1912.

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To all whom it may concern:

Be it known that I, WILLIAM H. DRURY, a citizen of the United States, residing at Waltham, in the county of Middlesex and State of Massachusetts, have invented a certain new and useful Lubricating-Packing, of which the following is a specification.

The invention relates to the kind of lubricating packings wherein yarn massed in loose and open form is compounded with oil or other lubricant.

The mass of yarn in the invention is suitable by its composition, form, permeability, resiliency and other properties for compounding with oil or other lubricant so as to produce a lubricating packing particularly well adapted for use in journal boxes of cars on railroads and electric railways, whereby to lubricate the journals of the cars. The mass of yarn bunched in loose and open form and compounded with lubricant constitutes a lubricating packing possessing and combining superior absorbing and capillary properties, ready permeability and especial degree of elasticity or resiliency as compared with other lubricating packings. It resists pressure, and when the bunch is squeezed or compressed it tends to spring back to the form it had before the squeezing or pressure was applied. This element of elasticity or resiliency is a special feature in the packing of the invention, and is attained in conjunction with the other serviceable qualities of the packing by uniting unsized yarn with sized yarn in the mass of the packing, as hereinafter set forth. In one case the mass consists of yarn which has in its entirety a portion unsized, with which is united an independently-spun portion coated with sizing and covered up or hidden by the unsized portion, so that the whole is springy and wiry from the sizing on its independently-spun and hidden portion. An illustration is yarn weighing in its entirety six grains per yard, whose unsized portion weighs five grains per yard, and its sized and hidden portion one grain per yard. A strand thereof is in fact double, but looks as if single. In another case the mass consists of yarn which has in its entirety two or more such unsized portions twisted together, with which are united two or more corresponding independently-spun and hidden portions coated with sizing, so that the whole

is also springy and wiry from the sizing on its independently-spun and hidden portions. An illustration is two-ply yarn weighing in its entirety twelve grains per yard, whose unsized portions weigh five grains per yard each, and its corresponding sized and hidden portions one grain per yard each. Such yarn is in fact quadruple, but looks as if composed of two unsized strands twisted together. In another case the mass consists of yarn of two or more ply, in which some of the strands are unsized and the rest sized, the two kinds being twisted together around each other, so that the whole is also springy and wiry from the sizing on its sized portion. And in another case the mass consists of unsized yarn and sized yarn which are only intermingled without being twisted together, so that the mass is springy or resilient from the sized yarn therein.

In the accompanying drawings Figure 1 is a view of one outer end of a trough to hold the sizing through which the sized portion of the yarn may run to be sized, and also shows a perspective view, partly in lengthwise axial section, of the yarn, which in this instance is core yarn, after the enveloping fibers have been spun upon the sized portion. It also shows by dotted lines and otherwise the interior and other mechanism of the trough and their position. Fig. 2 is a side view of a mass of the yarn loose and open preliminary to compounding it with lubricant for lubricating packing.

Yarn for the packing may be made in either of several ways.

(1) It may be what is called "core yarn," which has the external characteristics of a single strand of spun yarn and is composed of a spun core and a fibrous envelop uniformly surrounding, and spun upon, the core, such as is the subject of my United States Patent No. 763,377, dated June 28, 1904. Machinery for making such yarn is the subject of my Patent No. 763,378 of that date. It may be made in the same way as the yarn of that patent, except that a trough containing liquid or glutinous sizing is placed in position between the creel which holds the balls of core and the spinning straps between whose meeting surfaces the spinning of the enveloping fibers is done. In the drawings, Fig. 1 is shown a device suitable for the purpose. It is held in the position stated by any convenient means de-

sired. The sheet-copper trough A is closed at each end by a cast-iron plate B to which are fastened the sides of the vertical channel in which slides the block and toothed rack E. This block is moved up or down by turning a crank C on the shaft M which runs the whole length of the trough and carries near each end a pinion gear D which fits the teeth of the rack or block E. The glass rods F², F¹ run the length of the trough and rest on its side edges. The thin-shelled brass tubular roller G is plugged up at each end by a plug which has a journal which runs in a bearing in said block E. H represents a steam pipe running the length of the trough for keeping the sizing hot. L, running the whole length of the trough, is a wiper to regulate the amount of sizing each strand of core I shall retain. The operator raises the roller G as high as suits by turning the crank C and puts the strands of core under said roller and over said glass rods. Then he lowers said roller which runs in the sizing. The roller is revolved by progressive action of the said strands. Although the core is coated with sizing, it takes some time for it to harden, and, during the spinning of the enveloping fibers, the core is amply pliable and its suitability for performing its operations during the spinning process is not impaired by the sizing; but, after the spinning, the sized core hardens and stiffens naturally or by special drying, with the result that any loose and open mass of the yarn has the much desired elasticity or resiliency for lubricating packing, and the lubricant with which the mass is compounded, while readily permeating the enveloping fibers throughout the mass, does not affect the sized core in a way to make it limp or to impair the elasticity or resiliency of the mass, as the sizing used is such as not to be soluble with oil after the sizing hardens, and is such as to make the core wiry and springy without being unduly brittle. The sizing recommended will be mentioned later herein.

(2) What is known as the ordinary "woolen system" of making yarn consists in progressively removing sections of carded fibers from the ring doffers of a carding engine, running these sections between the condensing aprons of a condenser and rubbing and rolling them into strands of roving, winding the strands of roving upon a jackspool, and finally spinning the strands on a mule. With but little variation that system may be readily adapted to making yarn of the present invention. The variation consists in stationing above the level of the upper doffer and below that of the under doffer a creel holding balls of already-spun yarn, stationing intermediate between the creel and the condenser such a sizing trough as already described, conducting strands of

the already-spun yarn through the trough and guiding them by means of eyes so that between the doffer and the condenser the strands will progress with the fibrous sections and be rolled up and rubbed and consolidated with and into the strands of composite roving, which are then wound upon the jackspool as aforesaid. The like of the foregoing has been done and is known in the art, except to size the already-spun yarn. Then these strands of composite roving are spun on a mule or other mechanism without subjecting them to draft, as draft would stretch, impair or break the already-spun strands in the roving. Yarn thus made is not core yarn in the strict sense, but it is wiry, and a loose and open mass of it has the desired quality of elasticity or resiliency for lubricating packing, and at the same time its heavier portion has the permeability before mentioned.

(3) Instead of spinning said strands of composite roving individually as aforesaid, two or more of them may be twisted together directly into one from the jackspool and made into yarn by means of any suitable twister, and thus also may be made yarn which may be massed for the packing of the present invention.

(4) Yarn may be made in either of the ways mentioned in foregoing paragraphs designated (1) and (2), without sizing the separately-spun portion at all, or it may be made in any other suitable manner without any separately-spun portion at all, and one or more strands of unsized yarn made in any such manner may be combined with one or more strands of like yarn coated with sizing. They may be combined with each other by twisting them together into yarn of two or more ply, some of which will be coated with sizing and the rest not. The yarn of two or more ply will be springy and wiry from the sizing in the sized portion, while the unsized portion will be permeable with lubricant. The unsized portion may be so much heavier than the sized portion that the quality of the combined yarn for absorbing and retaining lubricant will not be detrimentally impaired, while the yarn as a whole will be springy and wiry, so that a loose and open mass thereof will have the desired permeability and elasticity or resiliency for lubricating packing.

(5) Unsized yarn and sized yarn made in any manner may be merely intermingled in a loose mass composed of the two kinds without twisting them together into one, with the lengths of unsized yarn and of sized yarn crossing one another in many directions and intertwining with one another. In order to make sure that any such mass will be like every other, and that the sized and unsized lengths may be properly arranged in the mass relatively to one another,

it is deemed preferable, before massing the yarn, to run a length of sized yarn alongside of any desired number of like lengths of unsized yarn, so that when the lengths form a mass they will be distributed throughout the mass to the best advantage. Sized leather yarn and fabrics made therefrom are the subject of a separate application of this date, No. 624,475, filed May 1, 1911, allowed June 14, 1911.

Any kind or mixture of fibrous material desired may be used for making the heavier portion of the yarn, but the material preferred is shredded leather mainly or a mixture of from 50 to 85 per cent. of shredded leather with from 50 to 15 per cent. of cattle hair, because it has been found that lubricating packing consisting of yarn made of such mixture and massed in loose and open form and compounded with lubricant is exceptionally suitable for packing the journal boxes of cars on railroads and electric railways and for lubricating the journals of the car axles. Lubricating packing consisting of yarn made of such mixture and so massed and compounded is the subject of my United States Patent No. 1,001,371 of August 22, 1911. Yarn of the present invention made of such mixture and massed and compounded as aforesaid is an improvement upon the lubricating packing of that patent, and is distinguished therefrom by having a sized portion and by being for that reason more springy and wiry, so that the improved packing is more elastic or resilient, than the packing of said patent.

Any sizing may be used which will render the sized portion of the yarn springy and wiry and is not readily soluble with oil. The sizing recommended is a glutinous compound consisting of fish-glue melted, diluted and mixed with water and thinned to a syrupy consistency like thin molasses. In that case the entire yarn will be springy and wiry and yet sufficiently bendable for lubricating packing when the sizing becomes dry and hard, and oil will readily saturate the unsized portion of the yarn without affecting the sized portion in a way to impair the elasticity or resiliency of a loose and open mass of the yarn. This sizing may be tempered with wax or other substance, if desired.

For lubricating packing the yarn may be arranged, massed, compounded and used the same as set forth in the said Patent No. 1,001,371. Before compounding the yarn for lubricating packing it is deemed preferable, before the sizing hardens, to crinkle it by running it between coarse fluted rolls, to cut it into lengths of about one yard each, and to deliver these lengths into a receptacle slowly revolving on a perpendicular axis so as to cause the lengths to cross one another in many horizontal di-

rections and to intertwine with each other in layers; all of which may be done in one continuous operation. It will be ready for compounding in the form of mass thus resulting, as soon as the sizing becomes hard. The crinkly form will become set, and will remain set after the yarn is compounded with oil, and hence by reason of its form, combined with the sizing in part of the yarn to keep it in form, a mass of the packing will be all the more permeable, and elastic or resilient. The crinkling, however, is not necessary. In Fig. 2 of the drawings N represents as nearly as practicable a loose and open mass of the yarn to be compounded with lubricant for lubricating packing.

I am informed that curled hair and unsized yarn have been intermingled in loose and open mass form for lubricating packing, whereby resiliency in the mass is produced from the springy quality of the curled hair. In the present invention the element of resiliency in the mass is obtained only by uniting unsized yarn with sized yarn in the ways hereinbefore set forth, whereby the resiliency may be of such degree as desired and is obtained cheaply, it is easy to distribute the unsized yarn and the sized yarn uniformly throughout the mass of the packing, and the sized yarn, no less than the unsized yarn, may be of such lengths as desired.

What is claimed as the invention is as follows:

1. Lubricating packing, consisting of composite yarn part of which is unsized and part of which is sized so as to be springy or wiry from the sizing therein, the said unsized and sized parts being united together into one with the sized part hidden by the unsized part, such composite yarn being in loose and open mass form so that the mass will be porous and readily permeable with lubricant throughout and will be resilient from the springiness or wiriness of the sized part of the yarn in the mass, and the mass being compounded with lubricating material, substantially as set forth.

2. Lubricating packing, consisting of composite yarn part of which is unsized and part of which is sized so as to be springy or wiry from the sizing therein, the said unsized and sized parts being twisted together around each other, such composite yarn being in loose and open mass form so that the mass will be porous and readily permeable with lubricant throughout and will be resilient from the springiness or wiriness of the sized part of the yarn in the mass, and the mass being compounded with lubricating material, substantially as set forth.

3. Lubricating packing, consisting partly of lengths of unsized yarn readily permeable with lubricant and partly of lengths of

sized yarn springy or wiry from the sizing therein and unpermeable with lubricant, such lengths of unsized and permeable yarn being intermingled and combined among
 5 and with such lengths of sized and unpermeable yarn in loose and open mass form so that the unsized yarn in the mass will be readily permeable with lubricant throughout while the combined mass will be resilient
 10 from the springiness or wiriness of the sized yarn in the mass, and the mass being compounded with lubricating material, substantially as set forth.

4. Lubricating packing, consisting of composite yarn part of which is unsized and composed mostly of shredded leather and part of which is sized so as to be springy or wiry from the sizing therein, the said unsized and sized parts being united together
 20 into one with the sized part hidden by the unsized part, such composite yarn being in loose and open mass form so that the mass will be porous and readily permeable with lubricant and will be resilient from the
 25 springiness or wiriness of the sized part of the yarn in the mass, and the mass being compounded with lubricating material, substantially as set forth.

5. Lubricating packing, consisting of composite yarn part of which is unsized and composed mostly of shredded leather and part of which is sized so as to be springy or wiry from the sizing therein, the said un-

sized and sized parts being twisted together around each other, such composite yarn being in loose and open mass form so that the mass will be porous and readily permeable with lubricant throughout and will be resilient from the springiness or wiriness of the sized part of the yarn in the mass, and the mass being compounded with lubricating material, substantially as set forth. 35 40

6. Lubricating packing, consisting partly of lengths of unsized yarn composed mostly of shredded leather and readily permeable with lubricant and consisting partly of lengths of sized yarn springy or wiry from the sizing therein and unpermeable with lubricant, such lengths of unsized and permeable yarn being intermingled and combined among and with such lengths of sized and unpermeable yarn in loose and open mass form so that the unsized leather yarn in the mass will be readily permeable with lubricant throughout while the combined mass will be resilient from the springiness or wiriness of the sized yarn in the mass, and the mass being compounded with lubricating material, substantially as set forth. 45 50 55

In witness whereof I hereto set my hand in presence of two witnesses on April 29, 1911. 60

WILLIAM H. DRURY.

Witnesses:

S. INEZ STONE,
HELEN I. CHELLIS.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."