W. H. DRURY.

LUBRICATING PACKING.

APPLICATION FILED JAN. 13, 1911.

1,001,371. Patented Aug. 22, 1911.

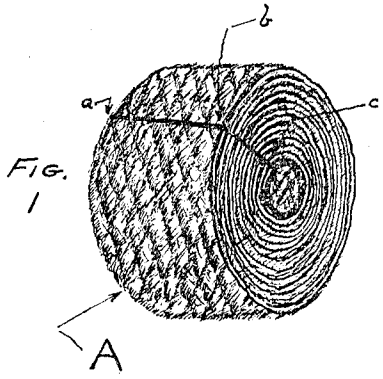

FIG. 1

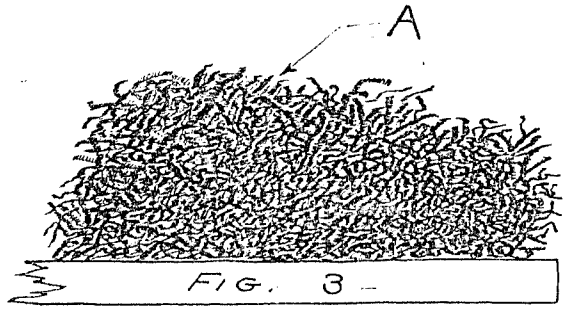

FIG. 3

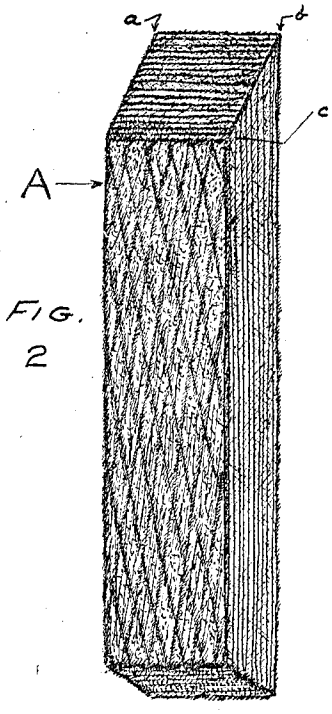

FIG. 2

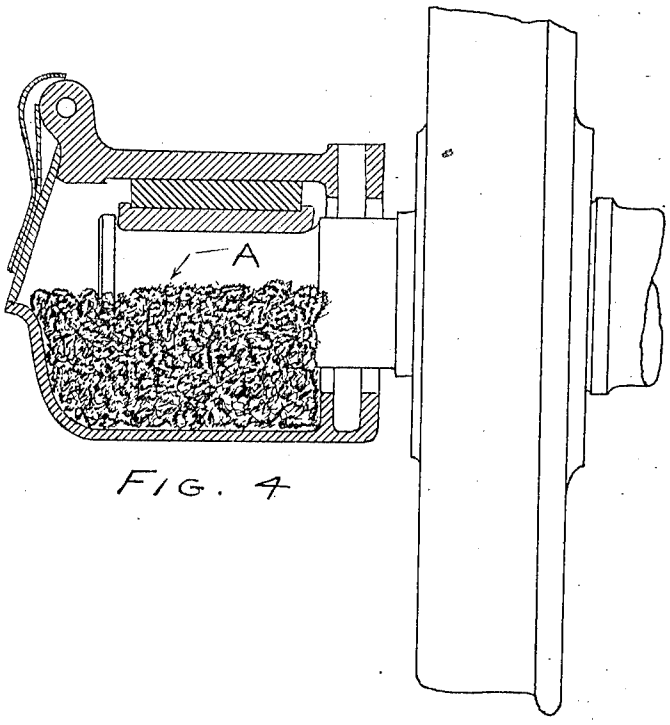

FIG. 4

WITNESSES:

Frank E. Hawkes.

Harry L. Bigby

INVENTOR.

William H. Drury.

UNITED STATES PATENT OFFICE.

WILLIAM H. DRURY, OF WALTHAM, MASSACHUSETTS, ASSIGNOR TO JOSEPH S. STEARNS AND GEORGE P. DRURY, BOTH OF WALTHAM, MASSACHUSETTS.

LUBRICATING-PACKING.

1,001,371. Specification of Letters Patent. Patented Aug. 22, 1911.

Application filed January 13, 1911. Serial No. 602,508.

To all whom it may concern:

Be it known that I, WILLIAM HENRY 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 object of the invention is a manufacture and also a process of manufacture of a lubricating packing especially durable and serviceable, conveniently applicable to use, readily renewable with lubricant by its permeability, sufficiently springy to hold itself reliably against a journal, and easy to keep care of, consisting of yarn spun from fibrous material containing a large percentage of shredded leather mixed with other fiber, and massed in loose and open form such as to be always readily permeable with lubricating material and at the same time to cause the various parts of the packing to cling together and not be separable from one another by use, the mass of yarn being compounded with lubricating material.

By shredded leather is meant leather which has been reduced to fine filaments in form of soft and fleecy fibrous material resembling wool of very short staple. It is a known form of leather, and is usually produced from scrap leather by well known shredding machinery in public use. It possesses in especial degree the quality of holding lubricant uniformly throughout its mass after it has become saturated with lubricant, so that the lubricant does not sink to the bottom, as it gradually does in the case of most materials used in lubricating packing.

The first step in the manufacture of the present invention consists in spinning the fibrous material into leather yarn, which term is used throughout this specification as intended to mean yarn made of fibrous material containing a large percentage of shredded leather. Thereby the shredded leather is essentially changed in form and character as compared with it in its raw state, for in the raw state its fibers are seldom so much as one-quarter inch long and have trifling coherence to one another, while after it is spun into yarn the yarn is of any length desired and has considerable tensile strength and coherence. Shredded leather of as long staple as obtainable should be used, because at best it is of poor spinning quality, and the longer staple makes the best yarn for the packing. The yarn is twisted rather hard so that it will be springy and will not sag or be limp in the packing. Instead of shredded leather alone, a mixture thereof with cattle hair, or with some other fiber more springy than shredded leather is used in spinning the yarn. It is preferred that the shredded leather in the mixture shall exceed 50 per cent. and be less than 85 per cent. of the mixture. It is found that yarn made from the mixture will have ample quantity of leather for holding the lubricant, and will be more springy than if of leather alone. The leather yarn may be spun as set forth in United States Patents Nos. 763,377, 763,378 and 763,737, granted to me June 28, 1904. Any other method, if there be such, capable of spinning the fiber to advantage, may be used. If core yarn, mentioned in said patents, be the kind used, as is preferred, the desired springiness in the yarn may be enhanced by employing a springy core. Rather heavy yarn of about from 5 to 10 grains per yard is recommended as preferable in most cases. The leather yarn may be doubled and twisted to make it of two or more ply, with improved results, but single ply may be used. Also leather yarn may be united in like manner with yarn of other fiber, so that the composite yarn, which is claimed to be within the scope of the invention, will combine the virtues of the leather yarn and of the other yarn.

After the leather yarn specially designed for the packing is completed it is put into open and loose mass form of spongy and cellular structure so as to take the fullest advantage of the properties of the material composing the yarn, and so as to make the mass springy and well adapted to receive the lubricant readily throughout the mass and to hold the lubricant most suitably for use. How this may be done will be described in connection with and by reference to the accompanying drawings:

Figure 1 is intended as a perspective view of a ball of leather yarn wound open and loose in cheese form. Fig. 2 is a perspective view of the same ball after it has been cut open on the line *a b c* of Fig. 1 and laid out flat in the layers of yarn which result from the winding, cutting open and laying out. Fig. 3 is a side view of a mass of the yarn loose and open and of spongy and cel-

lular structure naturally resulting from shaking up, expanding and lightening the body of yarn shown in Fig. 2. Fig. 4 is a front view of a journal box of a railway car packed with such a loose, spongy and cellular mass of leather yarn after it has been compounded with lubricating material, this being the largest of any single use for the packing.

There are various methods of massing the yarn into open and loose mass of the spongy and cellular structure mentioned. For example, the yarn may be made crinkled by running it lengthwise between coarse fluted rolls, or it may be curled in any of the well-known methods, and the crinkled or curly yarn may be run off into piles. Such piles will have the desired spongy and cellular structure. But the invention is not confined to any particular one method, and the one preferred is to wind the yarn into cheeses in loose and open fashion as illustrated by the ball A in Fig. 1; then to cut the cheeses open, as on the line *a b c* in that figure, and lay them out flat, as illustrated by the body A in Fig. 2; and then to shake out, expand and lighten the flat bodies into mass form, as illustrated by the mass A in Fig. 3. The flat bodies will be found upon examination to consist of many layers of yarn in netted meshes, with the yarn intertwined and crisscross, and when these flat bodies are shaken out, expanded and lightened it will be found that the layers of netted meshes, with the yarn intertwined and crisscross, still remain in the loose mass, and the mass is of spongy and cellular structure, approximately homogeneous throughout. All this will be readily understood by any artisan used to making and handling coarse yarn. The applicant does not confine himself to massing the yarn in the manner described, and the yarn massed may be in any loose and open form in which the mass will be porous or permeable with lubricant and clingy, and the yarn massed may be of any desired length or lengths.

To compound the leather yarn with lubricating material and thus complete the packing, several such masses as illustrated by A in Fig. 3 may be put into a mixing tank, and the lubricating material may be added and mixed with the yarn by stirring them together with a mixing rod until the lubricant permeates thoroughly all parts of the entire mass. The mass is so porous, spongy and cellular that it takes but trifling time to do the mixing, and the mixing does not change materially the form of structure of the mass. Generally the user determines what relative quantities of the yarn and of the lubricant to mix together, it being somewhat a matter of his judgment, but in general about two pounds of lubricant to one pound of yarn will be a good mixture for the packing. As the packing may be in many pieces and in loose layers, such quantity of it as may be wanted for any purpose may be separated from the rest; and this may be done without materially disturbing the form of structure of the part taken or of the part left.

Description of the method of using the packing in a journal box of a railway car will serve sufficiently well as a description of the method of using it in general for analogous purposes. In Fig. 4 the packing A is shown in the journal box in the position in which it is to be used, coming up well around the lower half of the circumference and outer end of the car axle. It is crowded in so that by its elasticity it will hold itself against the axle. It will keep the axle lubricated until the lubricant has been gradually consumed so much as to need renewal of lubricant to supply the place of what has been consumed. Occasionally on renewing the lubricant the packing is stirred up with a slender rod to keep it open and springy. Although the packing is in many pieces they are so long and so intertwined that they cling together, and none of the packing drops out of the journal box. The packing is durable, and with occasional renewal of lubricant will last a year or more in constant use. It is not necessary to complete the compounding of more of the packing than is required for immediate use.

It is impracticable in a linear drawing of the sort required by official rules to represent the lubricating packing in its position of use exactly or so as to distinguish it clearly from packing made of some other substances or of some other construction, but in Fig. 4 of the drawings an attempt is made to represent the packing in a journal box as nearly as in the nature of things is practicable.

The applicant is aware that shredded leather in its raw state is sometimes compounded directly with lubricating material to produce lubricating packing consisting of raw shredded leather mixed directly with lubricant. But the packing of the present invention is essentially different from that in several respects, owing to the change of form and character which the material undergoes by the change in condition from the state of raw material into the spun state of leather yarn. When oil is the lubricant used in the compound, as is usually the case, the mixture of raw shredded leather and oil makes a slushy or soggy compound which looks and is like mush or dough. About all the fibers are less than one-quarter inch long, and when mixed with oil they do not hold one another together appreciably in a coherent mass and can be easily separated from one another by stirring or shaking the mixture, and the mixture cannot be stirred or shaken considerably without

causing the fibers to come apart and assume new relation to one another in position. In consequence of this character of such packing, if it is used in such place as in a journal box of a railroad car where it is subject to constant shaking, jarring and jerking, much of the packing works out from the back end of the box and becomes lost, some of it rolls up into balls at the front end of the box, and the mass settles down away from the journal and leaves the journal without contact with lubricant. Owing to its nature and characteristics, such packing is unsuitable for use in any place where it is subject to any considerable jarring, shaking, jerking and vibration and where any settling or sinking of the mass of packing is liable to leave a journal without lubricant. As distinguished from that, the packing of the present invention, by reason of its form and character, utilizes the good qualities inherent in shredded leather for holding lubricant and makes them serviceable in a way and to a degree impossible of attainment in a packing in which the raw fiber, without any preparation to change its state, form and character, is directly mixed with lubricant. Owing to the form and character of the present packing, it is porous and stringy, as distinct from soggy or slushy like dough or mush, is readily permeable with lubricant when the yarn and lubricant are originally compounded and whenever renewal is desired, is in good degree clingy, springy and durable, and if it is used in a car journal box, no amount of shaking, jarring, jerking and vibration or other violence incidental to the ordinary operation of the train or car can cause the packing to work out of the box or to change from the position in which it is wanted, and all parts of it hold one another together and coöperate to keep the mass of packing in form and place.

What is claimed as the invention is as follows:

1. Lubricating packing, consisting of yarn of desired length or lengths spun from fibrous material containing a large percentage of shredded leather mixed with other fiber and having the material consolidated, twisted, bound and held together in the structure of the yarn, such yarn being in loose and open mass form so as to be porous and readily permeable with lubricant throughout the mass of yarn, and the mass being compounded with lubricating material, substantially as set forth.

2. Lubricating packing, consisting of leather yarn and other yarn combined and twisted together, with and around each other, into composite yarn, such composite yarn being in loose and open mass form so as to be porous and readily permeable with lubricant throughout the mass of yarn, and the mass being compounded with lubricating material, substantially as set forth.

3. The process of making lubricating packing containing shredded leather, consisting of mixing the shredded leather with other fiber, spinning the mixed fibers into yarn, preparing such yarn into loose and open mass form, and compounding the mass of yarn with lubricating material, substantially as set forth.

WILLIAM H. DRURY.

Witnesses:
RAYMOND T. PARKE,
GEORGE P. DRURY.

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