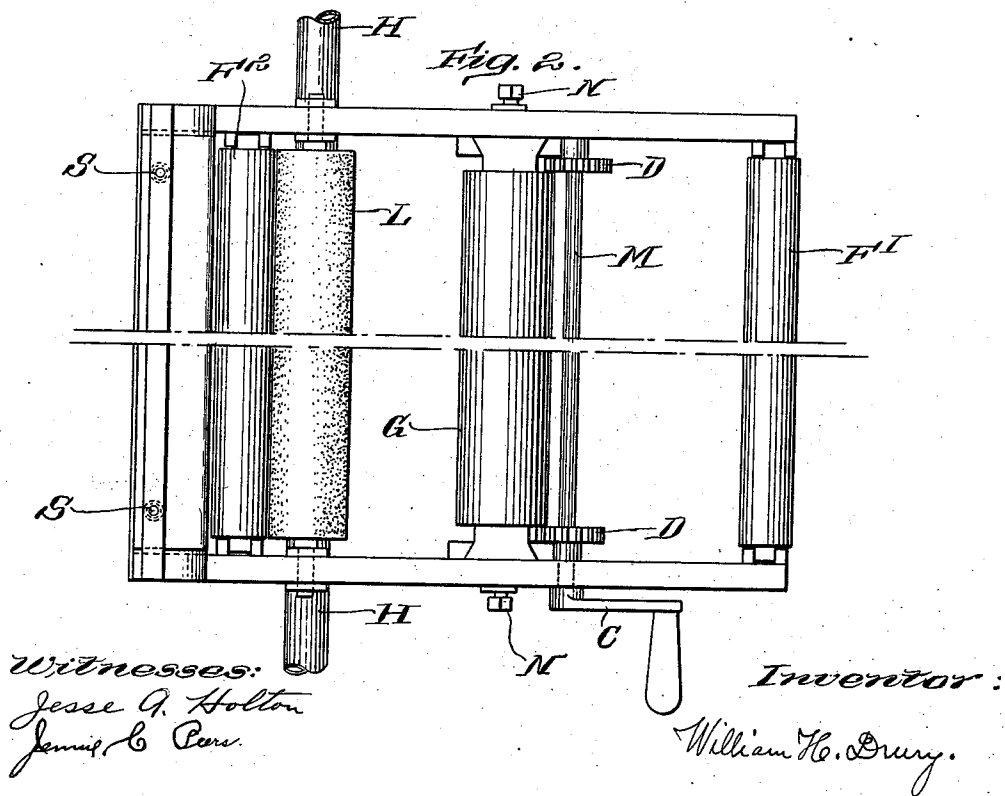
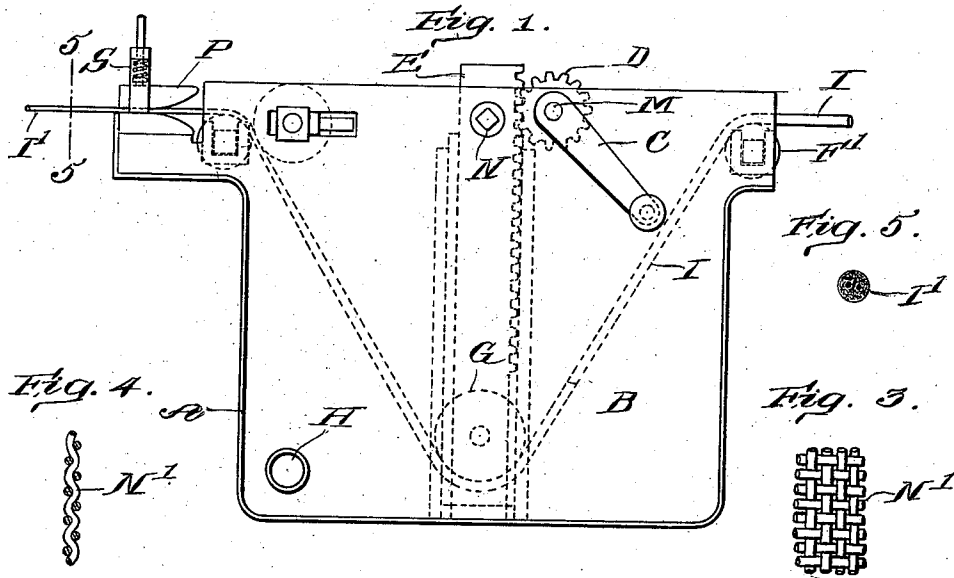


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LEATHER YARN AND LEATHER YARN FABRIC.
APPLICATION FILED MAY 1, 1911.

1,014,623.

Patented Jan. 9, 1912.



UNITED STATES PATENT OFFICE.

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LEATHER YARN AND LEATHER-YARN FABRIC.

1,014,623.

Specification of Letters Patent.

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Application filed May 1, 1911. Serial No. 624,475.

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 Improvement in Leather Yarn and Leather-Yarn Fabrics, of which the following is a specification.

The invention is an improvement on the inventions covered by my United States Patents No. 763,377, for yarn formed of fibrous materials, and No. 763,737, for woven fabric formed chiefly of fibers of leather, both dated June 28, 1904. The patent first mentioned covers "core yarn," so called, in general, irrespective of the kind of fibrous material of which the yarn is made, while the present invention is limited to what is herein called "leather yarn", specially treated, by which is meant throughout this specification yarn made of fibrous material containing a large percentage of shredded leather, which is a well known form of leather usually made from scrap leather by well-known shredding machinery, and looks very much like brown-colored wool of very short staple. The patent last mentioned covers woven fabrics in general made of core leather yarn, while the present invention is limited to a special leather fabric of that genus, woven from the specially-treated leather yarn aforesaid.

In the accompanying drawings Figure 1 is an end view of a sizing tank for treating many strands of leather yarn at a time, showing a strand of core leather yarn of two or more ply entering, going through and emerging from said tank and a trumpet-shaped or bell-mouthed die through which the strand is drawn as it emerges from the tank. Fig. 2 is a plan of the same tank. Fig. 3 is a plan of the leather-yarn fabric woven from such yarn. Fig. 4 is a cross section of said fabric. Fig. 5 is an enlarged cross-section of the leather yarn on the line 5, 5, of Fig. 1, after it has been drawn through the die.

In principle the tank A and its accompanying mechanism are essentially the same as the sizing trough illustrated in my separate application of this date for an improvement in machinery for manufacturing yarn. Further description seems unnecessary, and Figs. 1 and 2 show at sight the various parts

and the operation and purpose thereof. The tank is supposed to be of larger capacity than said trough. A special feature is the trumpet-shaped or bell-mouthed die P which is fastened to the inside of the tank, so that the sizing material squeezed out of the drawn yarn will go back into the tank. The die is in two parts held together by the adjustably-yielding pressure of a spring, the purpose of the yielding pressure being to allow for any unevenness in the yarn, so as to avoid breakages of the yarn. Before the yarn I enters the tank its diameter is comparatively large, but after going through the die P its diameter is much reduced, as shown at I¹.

The yarn of the present invention is distinguished from the yarn described in said Patent No. 763,377 and mentioned in said Patent No. 763,737 by being specially prepared and essentially changed after it is spun and before it is woven, so as to look, and so as to be, like real leather in smoothness, toughness, strength, flexibility, wearing quality, and other characteristics. It does not look like yarn, but looks like round leather shoe strings. In fact, it is more like such shoe strings than like anything else in most of its qualities and other properties.

It is to be understood that the leather yarn may be of any shape desired in cross section, as determined by the shape of the die through which it is drawn.

One way of making the leather yarn is to use a wet-spun flax core of about fourteen leas, and to spin thereupon enough shredded leather to make the core yarn of about two leas, then to twist two or more strands of such core yarn into one, then to run the yarn of two or more ply through specially-prepared hot sizing in the tank A, whereby the yarn becomes thoroughly soaked and saturated with the sizing material, and finally to draw the sized yarn through the trumpet-shaped die P, whereby it becomes rounded, consolidated, compressed, smoothed and polished, and looks as if single, as shown by I¹ in Fig. 5. In the sizing and drawing processes the leather fibers become interlaced and stuck together somewhat as they are in the real hide from which they originated. At the same time, with the use of proper sizing, as hereinafter recommended, the yarn is uncrackable and has that flexibility which

distinguishes properly-prepared real leather. Such yarn is useful for many purposes other than for weaving. For instance, it is useful for shoe lacings, also for fly netting to keep flies from biting horses. Those are only two purposes among many. The sizing may be such as to make the yarn springy and wiry, in which case the yarn is useful for mattresses and the like, in lieu of curled hair, after being curled in the same way as curled hair, and is useful to intermingle with unsized yarn in leather-yarn lubricating packing, which is the principal subject of my separate application of this date for lubricating-packing yarn, wherein the elasticity or resiliency of such packing is emphasized as due to the springy and wiry quality of the sized yarn which is intermingled with the unsized yarn in the packing.

The leather-yarn fabrics of the present invention, woven from the sized leather yarn aforesaid, are distinguished from those of said Patent No. 763,737 in several essential respects. They are almost immeasurably superior for all purposes for which leather itself is useful, owing to the previous treatment and preparation, already mentioned, of the yarn from which they are woven. The qualities of the yarn continue to exist in the fabrics woven therefrom. Hence they are distinguished by being tougher, stronger, more flexible, more durable, more easily woven, thinner in proportion to weight, more easily finished, less liable to crack on the surface, more like real leather all the way through, and far more useful. The style of weave recommended, when both warp and weft are of leather yarn, is the common plain two-harness weave, as shown by N⁷ in Fig. 3. But for many purposes wet-spun flax yarn of about fourteen leas is deemed preferable for the warp with leather yarn for the weft or filling. In that case the five-harness sateen weave is recommended, with one fifth of the warp on the face, and four fifths on the back, of the fabric. The flax warp hardly shows at all on the face of the fabric, and the fabric thus woven is of uniform thickness and smooth-faced on coming from the loom. In the after processes of pressing and finishing the warp on the face will be rendered invisible. However, any style of weave desired may be used, whether the fabric is all leather yarn or not. Two ply leather yarn such as already described is somewhat heavier, owing to the sizing, but of less diameter, owing to drawing through dies, than ordinary yarn of one lea. It can be woven with from twenty to twenty-five picks to the inch, if flax yarn like that before recommended is used for warp, but if the fabric is all of leather yarn it will have about twenty threads to the inch each way. The kind partly of flax will

weigh about four pounds, and the other kind about five pounds, per square yard. Usually after the fabric is woven it is either pressed under a powerful press or calendered with calender rolls. Then it may be finished in any way or style desired. It is a simple matter to waterproof it. The fabric aforesaid weighing about four pounds per square yard is about one thirty-second of an inch thick after it is pressed or calendered. Such fabrics are useful for many purposes, among which are foot-wear, leather jackets, carriage tops, automobile upholstery, car seats, furniture, trunks, valises, and many others too numerous to attempt to enumerate.

The sizing recommended for giving the leather yarn the external appearance and corporeal property characteristics of a single strand of flexible leather of like shape in cross section consists of what the tanners call "fat liquor" in prepared state diluted with about eight times its weight of water, glue dissolved in about four times its weight of water and mixed with enough castor oil to make it of the consistency of running molasses, casein dissolved with ammonia and as little water as needed for dissolving it, and Irish moss diluted with enough water to make it liquid, all of which are to be mixed together with a quantity of so-called "drop black" sufficient to color the whole and give it the consistency of thin molasses. Other compounds may be used, so long as they produce the desired effect above mentioned.

A compound consisting of ordinary sizing of corn starch or potato starch, mixed with a little melted glue and with drop black enough to color the whole, all being of pasty consistency like thin molasses, is recommended for giving the leather yarn the external appearance and corporeal property characteristic of a single strand of springy and wiry leather of like shape in cross section. But any other compound may be used which will produce the like effect. After the said flexible yarn is woven and pressed a good way to treat it is to daub it, put on the finishing touch with a brush, and expose the fabric to sunlight, using the same materials, and doing just the same, as is done in making patent leather, and in general, whatever be the style of finish desired, it should be treated as if it were native leather. The result will be that in face appearance and in face and body flexibility the fabric will have the characteristics of a sheet of soft leather.

The following is claimed as the invention:

1. Leather yarn having in external appearance and corporeal property characteristics of a single strand of flexible leather of like shape in cross section, and its leather fibers interlaced, consolidated, compressed and stuck together, and com-

posed mainly of shredded leather enveloping one or more independently-spun cores, substantially as set forth.

2. Leather yarn having in external appearance and corporeal property the characteristics of a single strand of springy and wiry leather of like shape in cross section, and its leather fibers interlaced, consolidated, compressed and stuck together, and springy and wiry from sizing, and composed mainly of shredded leather enveloping one or more independently-spun cores, substantially as set forth.

3. A leather fabric woven from leather yarn whose external appearance and corporeal property have the characteristics of a single strand of flexible leather of like shape in cross section, whose leather fibers are interlaced, consolidated, compressed and stuck together, and whose structure is mainly of shredded leather enveloping one or more independently-spun cores, substantially as set forth.

4. A leather fabric woven mainly from leather yarn whose external appearance and corporeal property have the characteristics of a single strand of flexible leather of like shape in cross section, whose leather fibers are interlaced, consolidated, compressed and stuck together, and whose structure is mainly of shredded leather enveloping one or more independently-spun cores, substantially as set forth.

5. A woven fabric of leather yarn having

in face appearance and in face and body flexibility the characteristics of a sheet of soft leather, and its leather fibers interlaced, consolidated, compressed and stuck together, and composed mainly of shredded leather enveloping many independently-spun cores, some of which lie parallel to one another in one direction and the rest in the reverse direction, all embedded and interlaced crosswise of one another in the interior of the fabric, substantially as set forth.

6. A woven fabric of leather yarn in one direction and of other yarn in the reverse direction, having in face appearance and in face and body flexibility the characteristics of a sheet of soft leather, and its leather fibers interlaced, consolidated, compressed and stuck together, and composed in one direction mainly of shredded leather enveloping many independently-spun cores which are parallel to one another and embedded in the interior of the fabric, and composed in the reverse direction of other yarn whose strands bind together, and are bound together by, the leather yarn, substantially as set forth.

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

WILLIAM H. DRURY.

Witnesses:

S. INEZ STONE,
HELEN I. CHELLIS.