

(No Model.)

J. LYALL.
WOVEN FABRIC FOR WHEEL TIRES.

No. 557,409.

Patented Mar. 31, 1896.

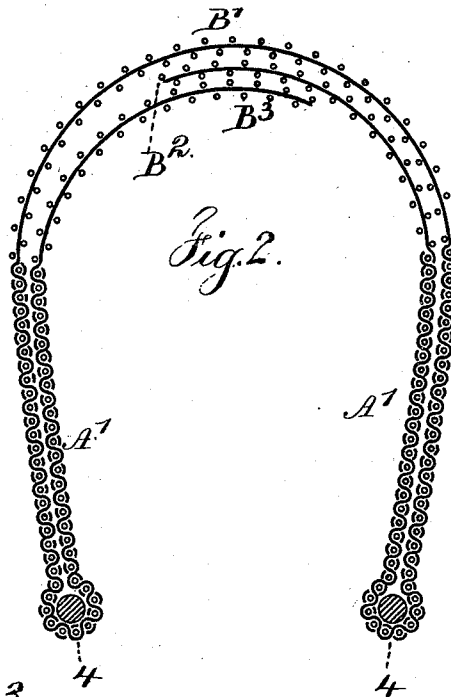


Fig. 3.

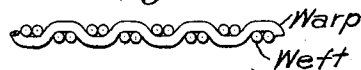
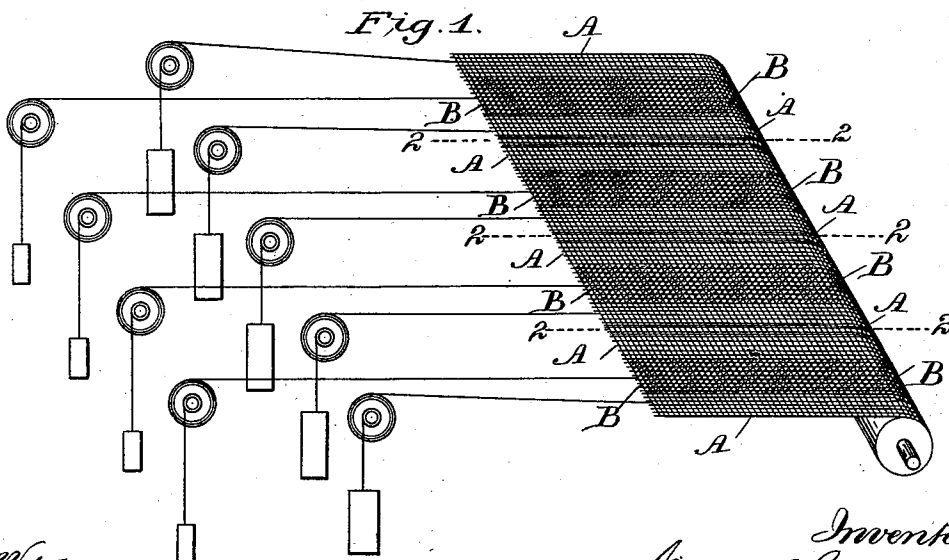


Fig. 1.



Witnesses

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JAMES LYALL, OF NEW YORK, N. Y.

WOVEN FABRIC FOR WHEEL-TIRES.

SPECIFICATION forming part of Letters Patent No. 557,409, dated March 31, 1896.

Application filed July 12, 1893. Serial No. 480,253. (No model.)

To all whom it may concern:

Be it known that I, JAMES LYALL, a citizen of the United States, residing in the city and State of New York, have invented an Improvement in Woven Fabrics for Wheel-Tires, of which the following is a specification.

Fabrics for wheel-tires have heretofore been made in some instances of a strip of woven canvas, and sometimes this has been cut on the bias so as to be adapted to be drawn into a tubular form and the ends joined up in making an elastic or pneumatic tire for a bicycle or tricycle, and in instances where the material has been woven so that the center of the strip is longer than the edges, so as to be adapted to form a hollow ring, difficulty has been experienced in applying to the surface of the woven fabric the rubber in a plastic condition by the action of calender-rolls, because the fullness in the middle portion of the strip has produced plaits or puckers in the fabric under the calender-rolls, resulting in the injury of the fabric and the improper application of the rubber to the surface thereof.

I weave the fabric for the wheel-tire flat and with the warp and weft threads corrugated or crinkled nearly uniformly where the same is to be folded to form the edges of the hollow wheel-tire and the central portions of the strip and the portions that lap upon the central portions of the strip having the warp-threads corrugated or crinkled to a greater extent than the weft-threads, the fabric being adapted to lie flat during the calendering operation or when the rubber is applied to the surface thereof. Usually the warps gradually decrease in length between the longest and shortest portions.

In the drawings, Figure 1 is a diagram illustrating the manner of weaving this improved fabric. Fig. 2 is a diagram illustrating the manner in which the strip is to be woven when the fabric is folded double and adapted to be bent up into the form of the hollow ring. Fig. 3 is a diagram illustrating the grouping of weft-threads.

A represents the portion of the fabric which is woven with the warp and weft threads crinkled with uniformity, or nearly so, as in ordinary weaving, and B represents the portion of the fabric where the weft-threads are

nearly straight and the warps have the principal portion of the corrugations or crinkles.

In Fig. 1 I have represented a portion of a piece of fabric adapted to be cut into strips after the same has been woven and calendered or the rubber applied to the surface, the lines of the separation of the respective strips being shown at 2, and in order to illustrate that the warps for the portion A are under greater tension than the warps for the portion B, I have represented some of the respective warps as passing over pulleys with weights attached, the weights for the warps of the portion B being considerably smaller than the weights for the warps of the portion A of the fabric, and the intermediate portions may be under intermediate tensions, if desired, so that the crinkling or corrugating of the warps will be in proportion to the length of the warps when the woven strip is bent into the form of a hollow ring.

The strip is made sufficiently wide for a central portion B' with elongated crinkled warps and the side portions B² B³ with similar warps, so that when the fabric is folded at the lines 4 in the uniformly-crinkled portion A' of the strip the two edges of the fabric will lap upon each other, and the long warps that have been crinkled or corrugated to a greater extent lie closely adjacent to each other, and the folded portions 4 4 form the edges of the fabric when in the form of the hollow ring, and by the before-mentioned improvement one or both surfaces of the fabric can receive the india-rubber, and they will adhere together where the edges lap upon each other, as indicated in Fig. 2, and where the surfaces of the fabrics come together, and in this instance it is preferable to include in the folds 4 either wires, cords, or other attaching devices, as represented in Fig. 2.

It will be apparent that this improvement is not limited to any particular character of weave, as the fabric may be woven plain or as a twill, or in some parts of the fabric more than one weft-thread may be laid into the shed, so as to group the weft-threads to any desired extent, as illustrated in Fig. 4, and where extra heavy canvas is desired the same may be woven in any usual manner, the before-described improvement being added.

In plain and twilled weaving it is usual to apply such tension to the warp-threads that the crinkling or corrugating will be nearly uniform in the warps and wefts, so that when
5 a square is cut out of a fabric and warp and weft threads are unraveled they will be the same length, or nearly so, when drawn out straight. As this is not the case in all parts of my fabric as woven, the foregoing description
10 sets forth which portions of the fabric contain the threads that are corrugated to a greater extent than the crossing threads, so as to be longer when the fabric is in the flat condition.

15 I claim as my invention—

1. A fabric for lining pneumatic bicycle-tires, woven with longitudinal portions of varying lengths, three different portions, which are to form the outer circumference of
20 the tire-lining, being longest, and two longitudinal portions, midway between the said three longest portions, being shortest, with gradual decrease of length between the longest and shortest portions, whereby the said

25 fabric, when folded longitudinally along its shortest portions, is adapted to make a tire-lining of double fabric gradually curved throughout its length so as to assume a complete circular form without being forced or stretched, substantially as set forth. 30

2. The herein-described fabric for wheel-tires woven as a strip of canvas with the warp and weft threads corrugated or crinkled nearly uniformly where the same is to be folded to form the edges of the hollow wheel-tire, and
35 the central portions of the strip and the portions that lap upon the central portion of the strip having the warp-threads corrugated or crinkled to a greater extent than the weft-threads, the fabric however being adapted to
40 lie flat during the calendering operation or when the rubber is applied to the surface thereof, substantially as set forth.

Signed by me this 6th day of July, 1893.

JAMES LYALL.

Witnesses:

GEO. T. PINCKNEY,

A. M. OLIVER.