J. W. BARBER.

WATERPROOF LEATHER WELTING.

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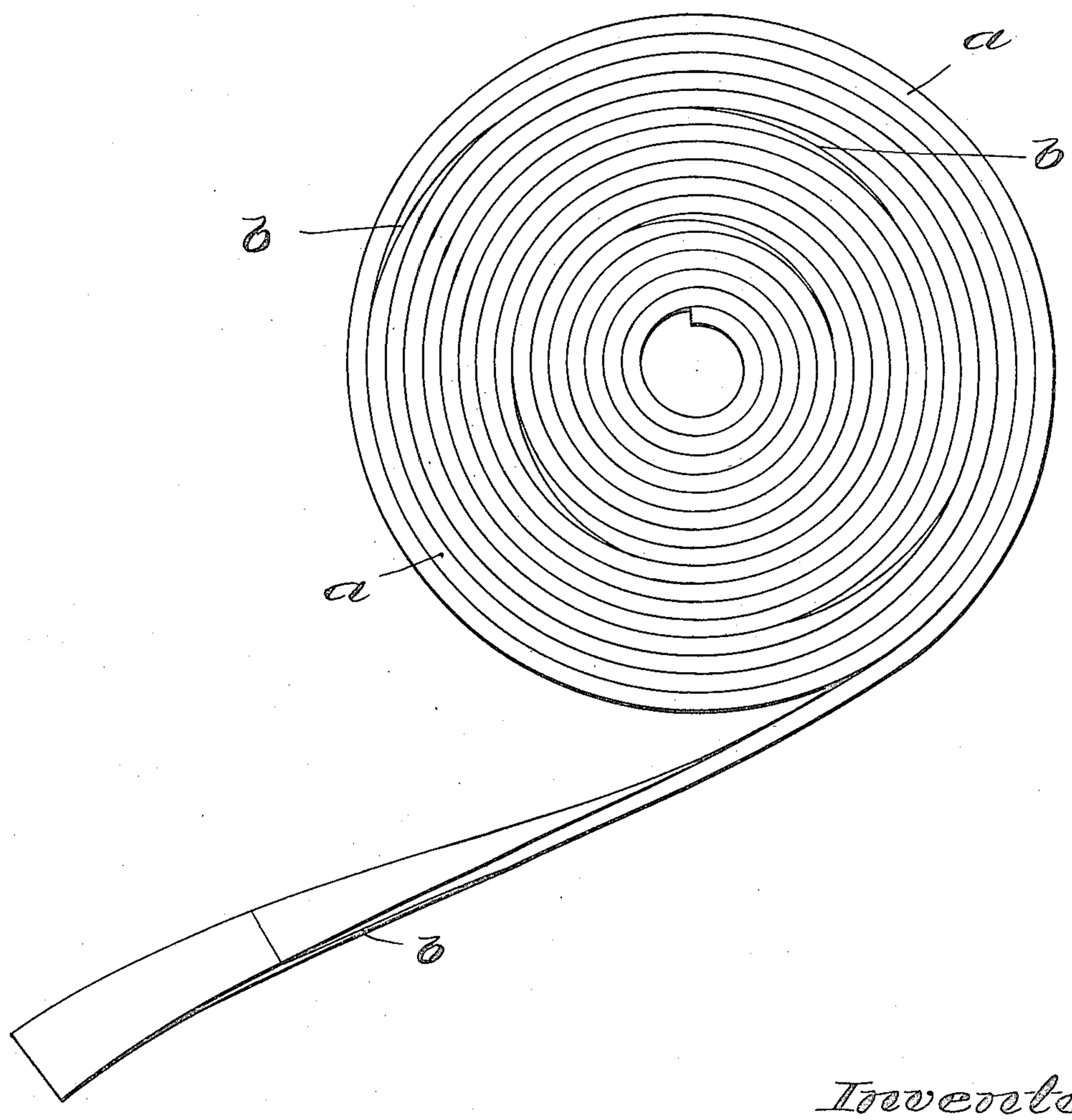
1,167,328. Patented Jan. 4, 1916.



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UNITED STATES PATENT OFFICE.

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WATERPROOF LEATHER WELTING.

1,167,328. Specification of Letters Patent. Patented Jan. 4, 1916.

Original application filed October 7, 1910, Serial No. 585,795. Renewed July 14, 1913, Serial No. 779,006.
Divided and this application filed April 14, 1915. Serial No. 21,357.

To all whom it may concern:

Be it known that I, JOHN W. BARBER, of Newton, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Waterproof Leather Welting, of which the following is a specification, this application being a division of my application originally filed October 7, 1910, Serial No. 585,795, renewed July 14, 1913, Serial No. 779,006.

In the manufacture of the better class of boots and shoes the custom has prevailed of attaching a strip of leather called a welt to the upper leather, and attaching the sole to this welt.

The welt or welting is applied usually by machinery and this welt is fed through a "welt guide," and as this guide is apertured to exactly fit the size of welting used, it has been the custom to immerse the welting in water to make it pliable enough to easily pass through such welt-guide when the sewing-machine is operated.

In early days the welting was cut from the hide in strips long enough to sew one or a pair of boots, and later it was made of a plurality of strips skived and cemented together at their ends, thus forming a long strip, which in turn was put up in rolls, usually fifteen yards or so, ready to be mounted on the sewing-machine, and this last is still the usual method. Owing to the necessity of soaking this welting, for the reason above explained, it has been the custom to make it of unstuffed leather, that it might the more quickly absorb moisture and it has been considered necessary to employ some kind of rubber cement which is not only pliable but also capable of resisting the moisture employed for rendering the strip pliable; any cement that can be attacked by moisture would not do, as the plurality of strips forming the welt-roll would then part.

It is practically impossible to cut strips from a large piece of waterproofed leather and then skive and cement the strips end to end, because suitable waterproofing materials such as hydrocarbon products are of such nature that no practical cement will durably connect leather which is impregnated with such material. On the other hand by first taking pieces of unstuffed leather and by the methods now employed, and with proper cements, uniting these strips and afterward waterproofing the same by my invention it is possible, for reasons hereinafter shown, to produce, without any change of methods in manufacturing, a boot or shoe without the defects noted above, and to furnish a shoe hermetically closed against moisture both as regards leather and stitching threads.

By my treatment of the strip to render the leather waterproof, the strip is left in such a pliable condition that it can be fed or drawn through the welt guide equally as well as the now commonly used moistened welt strips.

The accompanying drawing illustrates a roll of welting of a well known kind, but it is impossible to represent the waterproofing materials with which the leather is impregnated.

After the several sections *a*, *a*, have been skived at *b*, *b*, and united by any well-known or preferred cement, the entire strip (preferably before coiling the same) is impregnated with waterproofing ingredients. The ingredients and the method of impregnation, may be as described in my application hereinbefore referred to, said ingredients, as stated therein, being petrolatum and paraffin.

Not all kinds of cements are proper to be used in connection with my process, but inasmuch as some manufacturers are in the ordinary course of trade now cementing their welting in a way requiring no change by my waterproofing process, and as there are several kinds of cements to be found in commerce, I do not particularize concerning this step in its production.

The waterproofing ingredients may be placed in a suitable tank, unnecessary to illustrate, the waterproofing agents being placed in a state of fluidity by chemical action or by heat, and while in said tank a frame containing the welting may be immersed for the time required, which will vary according to the character of the leather, its thickness, etc.

While it may be possible to make a welting sufficiently waterproof with a single application of certain waterproof compositions I usually, for a perfect blending and proper "clench" of the materials employed, apply a succession of treatments, as for

leather in general, as explained in my application hereinbefore referred to, the first treatment being by impregnating the material with petrolatum and paraffin of the proportions of three parts of petrolatum to one part of paraffin, followed by another impregnation with the same ingredients but of the proportions of substantially equal parts. The first treatment is for flexibility and the last for the purpose of sealing the first applied impregnation and preventing any loss of waterproofing properties until the boot is absolutely worn out.

Much the same treatment is required as for the boot sole, the thing only to be borne in mind being that the flexibility must be equal to the demands of the welt-guide in the sewing machine.

There is another important factor in the production of a waterproof shoe also dependant upon the welting, viz, the stitching on of the sole. To permit a sufficiently strong thread being used to hold sole and welt together, the machine usually has an attachment for conveying heat to the usual waxed-end or thread. This serves in my invention as the vehicle for making hermetic every stitch hole and also excluding air from the sewing thread itself; the causes of many ruined boots not worn for some time after being made. The preferably last applied composition referred to is preferably crystalline in nature and of such a character that heat temporarily softens it. Consequently as the heated thread in the ordinary process passes through the sole and welting each strand of the thread takes up some of the waterproofing substance and is covered thereby, and said substance quickly solidifies, wrapping the strands and filling the holes. Whenever my process is applied to the soles as well, the result is as stated in my application referred to, viz, the sole and welt will always remain flexible, each stitch will be sealed, and the entire boot or shoe will be waterproof during practically its entire life of use and wear.

An especial advantage in my invention lies in the fact that a completed shoe having my improved welting is impervious to the transmission of moisture to the insole. Heretofore it has been impossible to produce a boot or shoe manufactured by the customary and most approved machinery processes that will be in anything but a comparative degree "waterproof" because unstuffed leather welting must act as a wick to convey moisture between the upper and the sole, direct to the insole with which the welt is in contact.

For the sake of brevity, I have employed the term "welting", but it is to be understood that I intend by this term to include such strips or ribbons composed of pieces of leather united and rendered waterproof as are adapted for, and capable of, the functions usually performed by the strips commonly known in the art of shoe-making as "welting", and I do not intend to cover, by this term, leather belting and analogous manufactures.

Having now described my invention, I claim:

1. As a new article of manufacture, waterproof leather welting consisting of a plurality of strips cemented together, the said welting having sufficient pliability to enable it to pass through the welt guide of a shoe sewing machine without being moistened, the welting also having sufficient strength to enable it to be secured in the ordinary manner.

2. As a new article of manufacture, a welt of leather formed of pieces united end to end and waterproofed substantially as shown and described.

In testimony whereof I have affixed my signature, in presence of two witnesses.

JOHN W. BARBER.