(No Model.)

G. D. ADAMS & W. L. BARRELL.

INSOLE FOR BOOTS OR SHOES.

No. 371,657. Patented Oct. 18, 1887.

Fig. 2.

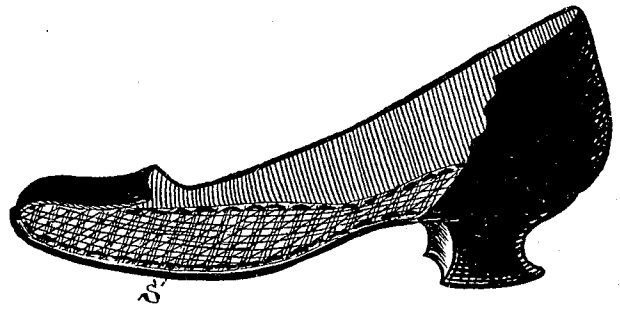

Fig. 3.

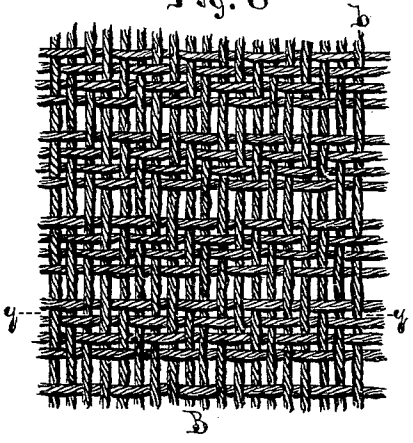

Fig. 5.

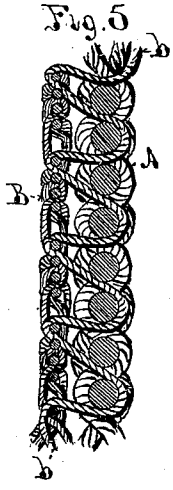

Fig. 4.

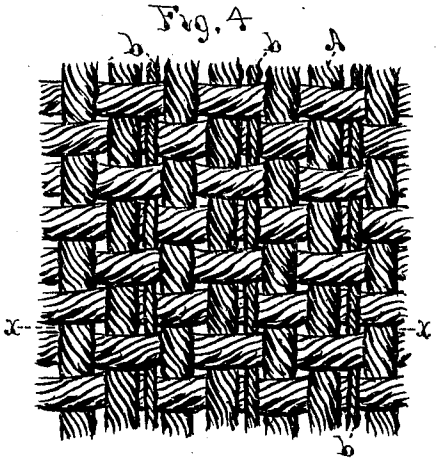

Fig. 6.

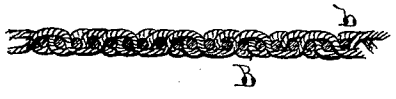

Fig. 1.

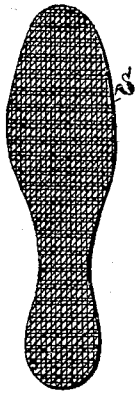

Fig. 7.

Witnesses
Wm. L. Brown
N. P. Ockington.

Inventors
George D. Adams.
William L. Barrell.
By David Hall Rice,
Atty.

UNITED STATES PATENT OFFICE.

GEORGE D. ADAMS, OF NEWBURYPORT, AND WILLIAM L. BARRELL, OF LAWRENCE, MASSACHUSETTS.

INSOLE FOR BOOTS OR SHOES.

SPECIFICATION forming part of Letters Patent No. 371,657, dated October 18, 1887.

Application filed October 20, 1886. Serial No. 216,697. (No model.)

To all whom it may concern:

Be it known that we, GEORGE D. ADAMS, of Newburyport, and WILLIAM L. BARRELL, of Lawrence, both in the county of Essex and State of Massachusetts, have invented a new and Improved Inner Sole for Boots or Shoes, of which the following is a specification.

Our invention relates to inner soles for boots or shoes; and it consists in certain new and useful constructions and combinations of the several parts thereof, substantially as hereinafter described and claimed.

In the drawings, Figure 1 is a face view of an inner sole constructed according to our invention. Fig. 2 is a side elevation of a shoe with a portion of its side broken away to show the method of using our inner sole in it. Fig. 3 is an enlarged view of a portion of the upper face of our inner sole, showing the weaving of the fabric on that side. Fig. 4 is an enlarged view of a portion of the lower face of our inner sole, or the face which is placed downward in the shoe, showing the weaving of the fabric on that side. Fig. 5 is a vertical section through the piece of fabric, showing the weaving which connects its two parts or faces together. Fig. 6 is a transverse section on line *y y* of the part of the fabric on the side shown in face view in Fig. 3. Fig. 7 is a transverse section on line *x x* of the part of the fabric on the side shown in face view in Fig. 4.

S is the inner sole of the shoe, which is made to combine the necessary stiffness and durability throughout its thickness and the necessary softness and pliability upon the face thereof with which the foot comes in contact in the shoe, in the following manner:

The fabric of which the sole is composed is woven double, or two-ply, one ply of which, A, is formed of very heavy and coarse hard-twisted cotton threads—such as is commonly known as "cotton duck"—while the other ply, B, is formed of fine and soft threads. The two plies A and B are united by one of the fine and soft threads *b* of the ply B, being carried into the ply A and around its threads at intervals, as shown, in the weaving of the fabric. This method of weaving prevents any of the coarse and harsh threads of ply A from being brought into contact with the foot of the wearer of the shoe, and unites the ply B to the ply A by a connection slightly elastic or yielding, giving the former a capacity of slight movement upon the latter, thus rendering the inner sole easier to the foot of the wearer.

We are aware that it has been customary to weave fabrics of two or more plies for clothing and household and other furnishing; but none of these have possessed the necessary stiffness in one ply to form the inner soles of shoes, combined with the requisite softness and pliability in the other to protect the foot from the harsher ply, both because not woven with that end in view and chiefly because they are not made of fibers of that stiffness and solidity when woven to produce these effects. This is because the combination of these characteristics to the necessary extent in our fabric renders it quite useless for clothing or furnishing purposes.

When the fabric is woven as described, the inner sole is cut out of it of proper shape, as shown in Fig. 1, and is saturated with a sizing-liquid to prevent the threads from raveling or pulling apart and the plies from being separated. The sizing-liquid may be used to saturate the fabric, however, before the sole is cut out of it. After being thus properly sized and dried, the inner sole is inserted into the shoe and sewed therein in the usual manner, as shown in Fig. 2.

It will be observed that no pressure or strain of the foot upon the upper ply, B, of the sole, even when the latter is saturated with heat and moisture, as is often the case, will materially disturb the relations of the two plies A and B of the sole; nor will such pressure, heat, and moisture destroy the stiffness of the lower ply, A, since these qualities come from the coarse and hard twist of its threads in the weaving. It will further be observed that this method of uniting the plies together to form an inner shoe-sole takes the strain of the foot off the fastenings by which the sole is secured to the inside of the shoe, and renders the shoe more durable, since the connection between the plies eases the strain upon the lower one.

What we claim as new and of our invention is—

1. As a new article of manufacture, an inner sole for boots or shoes, formed of more than one ply, the ply on one side or face being woven of coarse hard-twisted threads adapted to give the necessary stiffness, and the ply upon the other side or face being woven of finer, softer threads, and said plies being united together by fine threads *b b*, substantially as described.

2. As a new article of manufacture, an inner sole for boots or shoes, formed of more than one ply, the ply on one side being woven from coarse hard-twisted threads adapted to give the necessary stiffness, and the ply on the other side or face being woven from finer and softer threads, and said plies being united together by threads *b b*, and the sole being saturated with size adapted to prevent said plies from raveling and separating, substantially as described.

GEO. D. ADAMS.
WILLIAM L. BARRELL.

Witnesses:
DAVID HALL RICE,
N. P. OCKINGTON.