

F. E. HALL.  
Rubber Boots and Shoes.

No. 216,269.

Patented June 10, 1879.

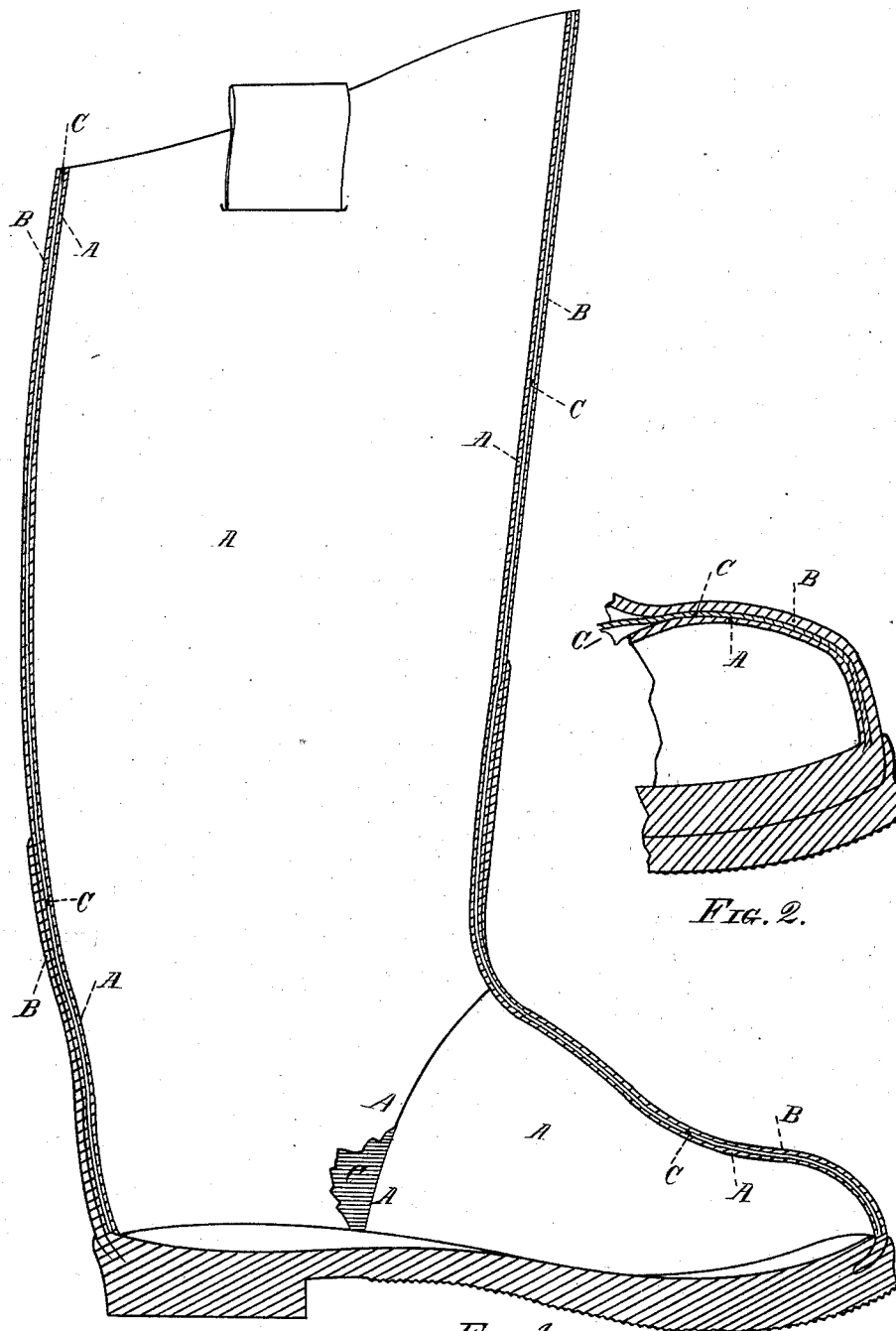


FIG. 1.

FIG. 2.

Witnesses:  
C. H. Hayes  
Charles C. Chick.

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Frank E. Hall,  
by A. H. Peck  
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# UNITED STATES PATENT OFFICE.

FRANK E. HALL, OF PORTLAND, MAINE.

## IMPROVEMENT IN RUBBER BOOTS AND SHOES.

Specification forming part of Letters Patent No. **216,269**, dated June 10, 1879; application filed March 15, 1879.

### *To all whom it may concern:*

Be it known that I, FRANK ELMER HALL, of Portland, Maine, have invented certain Improvements in Rubber Boots and Shoes; and that the same are fully described in the following specification, and represented in the accompanying drawings.

The object of this invention is to increase the durability and efficiency of rubber boots and shoes, and to render them capable of repeated inward cleansing.

My invention consists in a rubber boot or shoe provided with a distinct inner lining of vulcanized-rubber compound, and having between said lining and the outer coating of rubber an interposed sheet of cloth or other fibrous material.

It also consists in such a boot or shoe constructed with the seams or joints of the lining located diversely from those of the outer coating.

In either case the parts are united in the process of vulcanization.

The drawing shows, in section, a boot constructed according to my invention.

It is customary in the manufacture of rubber boots and shoes to apply an inner lining of woolen or some other textile material, coming next to the leather boot or to the foot or stocking of the wearer. With such construction the textile lining is speedily soiled, and after a few weeks wear becomes so permeated with foul odors and perspiration from the feet as to be very offensive and positively injurious to health. No cleansing can remove the filth so incorporated with the fiber of the lining; and, since it is impossible to wash it clean or wipe it dry, the lining is soon rotted away and becomes worthless.

By my improvement the lining is made of rubber compound, and vulcanized with and to the outer coating of rubber through the interposed fibrous sheet, so that the inside of the boot presents a smooth surface of vulcanized india-rubber, which is entirely non-absorbent of odors, impervious to moisture, and may be readily and repeatedly washed or swabbed out, and quickly dried, so as to be permanently sweet and durable.

In the drawing, A is the lining of rubber, applied in its unvulcanized state directly upon

the last or mold which gives the internal form to the boot. B is the outer coating of rubber, forming the boot proper, and applied in the raw state over the lining A, to which it is fitted snugly. C is an interposed sheet of cotton cloth or similar textile material, placed between the parts A and B, and usually calendered, so as to be integral with one of said parts, and hence requiring no separate cutting or fitting. This textile sheet or layer serves to stiffen the stock, since the rubber from the sheets each side of it unites through its meshes, and it adds to the strength of the material far more than an equal thickness of rubber would do. The boot also retains its original form much better than if all rubber. I usually cut both outer coating and lining from stock having such a fibrous backing, thus bringing two textile sheets between the rubber body and lining.

I cut the stock for the rubber lining somewhat differently from that which is to form the outside, so as to bring the seams along different lines, or to break joints, in order to guard against leakage by reason of holes inadvertently left where the seams occur. It is obvious that, under this arrangement, in no case can moisture penetrate beyond the point where the outer and inner rubber sheets meet, since a perforation in one would be stopped by the impervious wall of the other.

To facilitate withdrawal of the last or inward former after the boot is vulcanized, I make said last of wood or metal in three or more parts, somewhat analogous to a boot-tree, and I dust the surface thereof thoroughly with powdered talc or soap-stone to prevent adhesion of the rubber lining thereto. When the central part of the last is withdrawn the sides are free to approach each other, and all may be readily removed.

The boots will ordinarily be made in metal molds, and may be vulcanized by steam heat, since the steam does not penetrate the rubber lining, as it would the usual woolen lining, which is thereby caused to peel away from the rubber, to which it should be permanently united.

I do not deem it necessary to explain the mode or process of compounding or vulcanizing the rubber, nor the details of manufac-

turing rubber boots or shoes, since these steps are well understood by those skilled in the art to which my invention relates.

I claim as of my invention—

1. A rubber-lined rubber boot or shoe having interposed between the lining and the outer body of rubber one or more sheets of suitable textile material, the several parts united by vulcanization, substantially as and for the purposes set forth.

2. A rubber boot or shoe provided with a rubber lining and an interposed fibrous body vulcanized thereto, and having the seams of the lining located differently from those of the outer body of rubber, substantially as and for the purposes set forth.

FRANK ELMER HALL.

Witnesses:

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