

UNITED STATES PATENT OFFICE.

RYAN HEATON, OF SANDY HOOK, CONNECTICUT, ASSIGNOR TO THE UNITED STATES RUBBER COMPANY, OF NEW JERSEY.

KNIT BOOT.

SPECIFICATION forming part of Letters Patent No. 625,331, dated May 23, 1899.

Application filed March 17, 1898. Serial No. 674,236. (No specimens.)

To all whom it may concern:

Be it known that I, RYAN HEATON, a citizen of the United States of America, and a resident of Sandy Hook, county of Fairfield, Connecticut, have invented certain new and useful Improvements in Knit Boots, of which the following is a specification.

My invention relates to the manufacture of knit boots or shoes; and it consists of certain novel methods employed in the manufacture thereof and in the improved product, substantially as herein described.

I first knit in any suitable shape, but preferably in the form of an elongated bag, fabric which when full forms the body of the boot. This fabric may be made by weaving or braiding or in any other suitable manner, although at present I prefer to knit it. Instead of being made in the form of an elongated bag it might be made in a form more nearly resembling the finished boot, or it may be made in any other desired form. A further description of this step in the process of manufacture is not necessary, as it is already well known in the art. In some instances to give additional rigidity or strength to the finished product the form from which the boot is to be constructed is made in whole or in part of a double fabric, or two fabrics after knitting may be associated or assembled one within the other.

It is well known that boots made solely of knitted fabric full to size and shape are lacking in stiffness, warmth, and imperviousness to moisture. Heretofore these desirable qualities have been imparted to the boot either by attaching to one or both surfaces a bat by jiggling or by incorporating therewith flock.

An objection to boots the interstices of which are filled by flock is the tendency of the short fibers to become disengaged from and to work out of the fabric in use, while in those cases where a bat has been attached by jiggling the fibers, while longer than the fibers of flock, do not, practically speaking, penetrate, nor are they introduced into the interstices of the fabric and are therefore liable to be separated therefrom in use and leave it

comparatively open for the absorption of moisture. I overcome both these difficulties and produce a stronger, more durable, and better product in the following manner: I lay upon the fabric a suitable bat as distinguished from flock, and I then proceed to incorporate the fibers of this bat into the fabric by mechanical means—as, for example, a punching-machine or needle-loom provided with gangs of roughened needles which engage with the fibers on the upper side, carrying them into and through the fabric. The bat, if desired, may be punched through the fabric from both sides. The fabric is then subjected to the fulling process and is subsequently lasted in the well-known way.

The effect of the fulling process is both to consolidate the fabric onto the loose penetrating fibers and also, as it were, to knot these penetrating fibers on both sides of the fabric, by which means they are securely held in place and will not be dislodged in use. When a double fabric is employed, I prefer to punch the bat through from both sides of the compound fabric, and in this case the penetrating fibers, being knotted by the fulling process, as above described, in effect sew the two fabrics together in such a manner that they are not liable to be separated in use.

It will of course be understood that various modifications and changes may be made without departing from the spirit of my invention and without exceeding the scope of the claims.

What I claim is—

1. The process of making fabric boots, consisting in forming a woolen fabric of larger dimensions than the finished boot; of then incorporating with the fabric so formed, woolen fibers which are punched into and through the same; and subsequently fulling the fabric and lasting it to form the finished product.

2. A fabric boot, composed of a suitable woolen fabric, with which are incorporated unspun-wool fibers introduced into and passing through the same from side to side, and held in place by shrinking or fulling.

3. A fabric boot, composed of a suitable

woolen fabric, with which are incorporated, before shrinking or fulling, unspun-wool fibers introduced into and passing through the same from side to side, which are held in
5 place by shrinking or fulling.

4. A fabric boot composed of a suitable woolen fabric, with which is combined a wool bat, the fibers of which are in part intro-

duced into and pass through the fabric, and are held in place by shrinking or fulling. 10

Signed by me, at Medford, Massachusetts, this 18th day of February, 1898.

RYAN HEATON. [L. s.]

Witnesses:

CHARLES W. S. MOODY,
HARRY P. SKIPPER.