(No Model.)

E. A. SAUNDERS.

RUBBER BOOT.

No. 437,907. Patented Oct. 7, 1890.

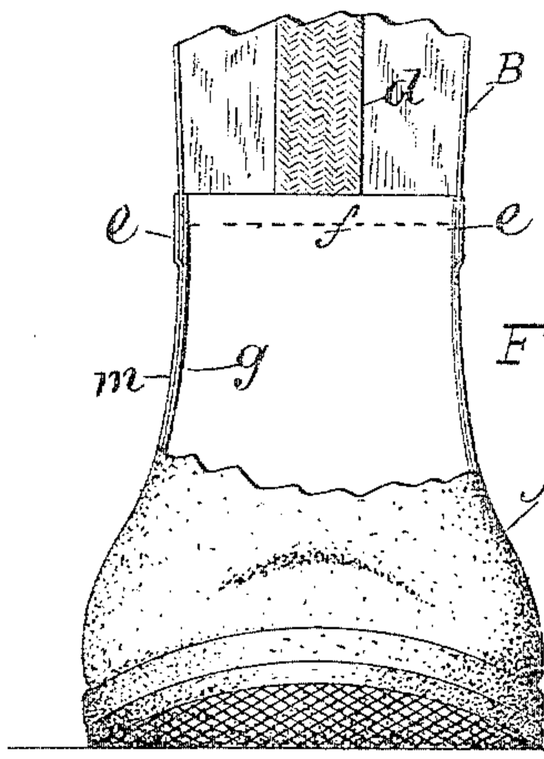

Fig. 3.

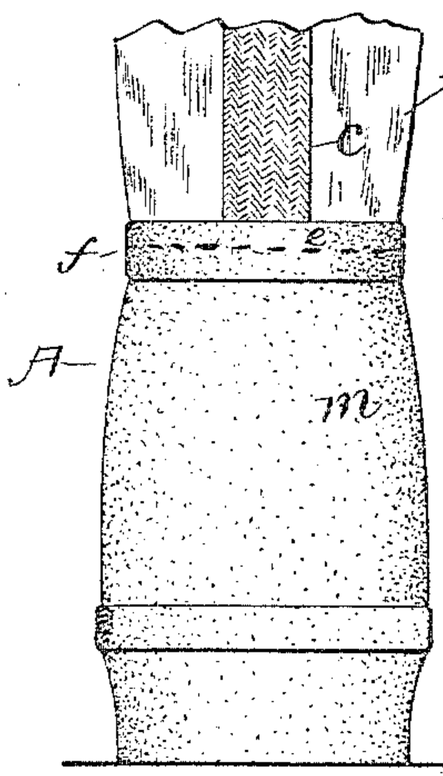

Fig. 2.

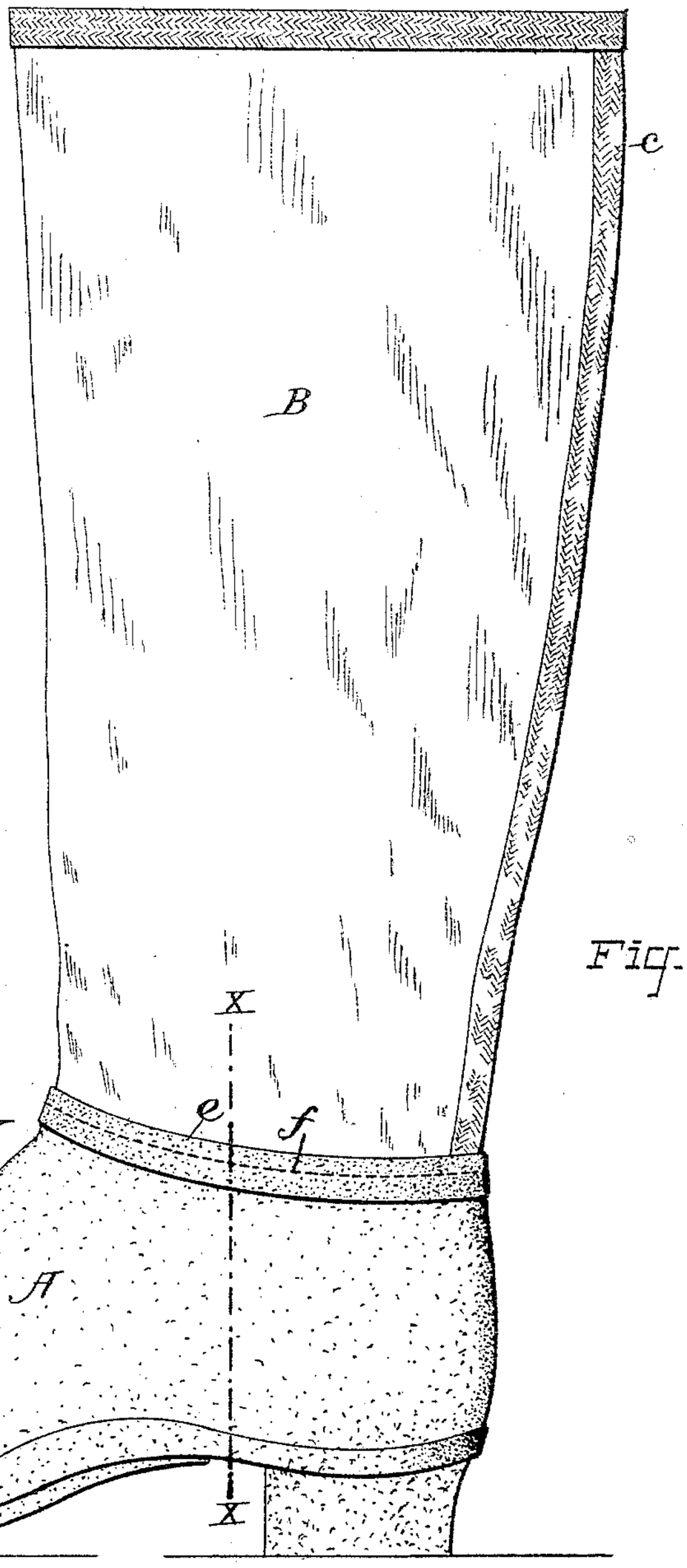

Fig. 1.

ATTEST:
J. A. Hurdle
Ed. Leary

INVENTOR:
Emmett A. Saunders
By J. N. McPherree
Attorney

UNITED STATES PATENT OFFICE.

EMMETT A. SAUNDERS, OF NAUGATUCK, CONNECTICUT.

RUBBER BOOT.

SPECIFICATION forming part of Letters Patent No. 437,907, dated October 7, 1890.

Application filed April 24, 1890. Serial No. 349,230. (No model.)

To all whom it may concern:

Be it known that I, EMMETT A. SAUNDERS, of Naugatuck, in the county of New Haven and State of Connecticut, have invented certain new and useful Improvements in Boots or Shoes; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, making part of this specification.

My invention relates to that type of boot or high-top shoe into the construction of which rubber or other allied gum enters as an ingredient operating both to render the manufactured article water-proof and to furnish the adhesive or cohesive power or quality by which the parts are held together into a whole after vulcanization; and it has for its object to provide for use a boot or shoe of a new species, in which, while the foot portion shall be made substantially after the fashion of this portion of an ordinary rubber or cloth and rubber boot or shoe, that portion above the part so made and joined to it shall be composed of different material and shall possess certain desirable structural qualities or characteristic features which do not exist in this portion of a boot or shoe involving the use of rubber to render the article of foot-wear water-proof throughout its whole extent.

The object of this invention is to combine with the ordinary rubber foot a leg or ankle section which is preferably water-proof, but which shall not have rubber as a part of its material, and which shall be able to stand alone and will not need any support at the top to hold it up, although it may be closed around the leg at the top to exclude dirt, snow, or water, or anything of that kind that otherwise might find an entrance there.

It is well known that the ordinary rubber leg of the rubber boot has a tendency to crack, and that the usual way of overcoming this tendency is to thicken the rubber; but in despite of any thickness, if there is an angular bend or wrinkle, caused by the act of walking, the rubber will crack at that angle long before the boot or shoe is worn out. Therefore the practice has been to make still thicker the ankle-section of the article, for this is the place where angular bending is liable to take place. In this way it has come about that the ankle-section of rubber boots and high "gum" shoes have become thick, heavy, and cumbersome, and has necessarily been made very large in order to allow the entrance and withdrawal of the foot through this inflexible portion. Much effort and inventive skill have been brought to bear to relieve rubber foot-wear of this evil, and, so far as I know, so far without success. The effort has been made to substitute for the ordinary leg a very light gossamer material, which is not able to stand alone, but which must be supported by being strapped up around the leg of the wearer at the top. Whatever advantages might be derived from this construction, it is plain that its peculiar disadvantages will prevent its adoption by a very large proportion of the wearers of rubber goods. The very plain liability of such a boot-leg to tear or to be punctured by almost anything with which it would come in contact is sufficient to make it very unsuitable to the uses to which rubber boots are usually put.

To enable those skilled in the art to which my invention most nearly relates to understand and practice the same, I will now proceed to more fully describe it, referring by letters to the accompanying drawings, which make parts of this specification and to render my explanation as full, clear, and explicit as possible, I shall, in explaining the nature of my invention so that those skilled in the art can practice it correctly, refer by comparison to the prior state of the art as known to me and others familiar with the manufacture of rubber goods for foot-wear.

In the accompanying drawings, Figure 1 is a side view or elevation, Fig. 2 a partial back view, and Fig. 3 a partial vertical section at the line *x x* of Fig. 1, looking in the direction indicated by the arrow, of a boot made according to my invention, and showing the latter carried out in the manner in which I have so far practiced it, though in carrying said invention into effect various modifications may of course be made.

In the several figures the same part will be found always designated by the same letter.

In a boot or shoe such as I propose to provide for use under my invention the above-mentioned serious and other latent objectionable

features of the ordinary rubber or cloth and rubber article of foot-wear are wholly avoided, since by making the leg portion, or all that part of the boot or shoe which extends upward from a point below the level of the ankle-joint of the wearer, of some material or materials which render it possible to make this part of the article sufficiently flexible, while it is at the same time capable of supporting itself, I am enabled to manufacture a boot or shoe in which, by reason of the absence of rubber in this portion of the boot, all liability of cracking (as the result of any angular bending of the stock) is wholly avoided, and hence the greatest degree of lightness consistent with a fair degree of durability is attained, while there is none of that liability to snag or tear which is a feature of the gossamer leg, above referred to, besides other advantages, some of which will be mentioned later.

In the drawings, A is the foot portion, and B the leg portion of a man's long-legged boot made according to my invention, and in which the first-mentioned part of the article shown is composed of rubber and cloth, while the last-named is composed of a heavy cotton cloth or ducking, which is capable of supporting itself in the form of a boot-leg without collapse and without being strapped up to the leg of the wearer. This cloth is rendered sufficiently water-proof to answer the required purpose, either by the manufacturing process by which it is constructed, or it may be treated after manufacture by any process for rendering textiles impervious to water (excluding, of course, the usual treatment with rubber.)

In the case shown the leg portion B of the boot is made of a single piece of heavy cloth, cut to a proper pattern and having its two longer opposite edges joined to form a seam up and down the middle of the back part of the boot-leg, which seam is shown as covered by external and internal narrow strips *c* and *d* of cloth, secured in place, as illustrated, by cementation to the stuff composing said leg portion, but may be of course made in any other manner. This part of the improved article may, however, be made of some other sufficiently strong, durable, and flexible material capable of resisting to the desired extent the penetration of moisture and properly protecting the leg of the wearer, and it may be formed, woven, or fashioned, if found expedient to so manufacture it, without any seam whatever. It may also be composed of two or more plies, either one of which may be a water-proof ply, though not rendered water-proof by the use of rubber, to dispense with the use of which in this part of the boot is one of the main objects of my present invention. The seam may also in some cases be made at the sides instead of at the rear, or it may be in one place in one ply and at another in the other. Innumerable changes may be made in this direction without departing at all from the spirit of the invention. Whether made seamless or otherwise and whether of one or another suitable material and of one or more plies of that material, it can and should be made, it will be understood, of such size and shape as to properly fit the leg of the wearer—somewhat after the fashion of a properly-fitting leather boot-leg—in contradistinction to being made unduly large and with the misfit shape peculiar to the leg portions of rubber boots. This leg portion B is joined at its lower extremity to the upper edge portion of the foot part A of the boot. This joint is one where the utmost strength is required, and one of the members B not containing any rubber and being of a somewhat coarse hard texture, it is obvious that it will be extremely difficult to effect such a joint, in the usual way, by cementation. Again, such is the character of the material of which this one part is composed that it may, especially when not waterproofed by some suitable process, absorb moisture, which will be drawn down into the seam by capillary attraction, and which, when there, will have a tendency to cause the rubber of the foot portion A to cleave away from the fabric of B. Again, some of the best methods chosen for making a textile water-proof without the use of rubber may be of such a nature that there will be an utter lack of affinity for rubber cement, thus adding to the difficulty of securing a proper joint or combination between the unrubbered leg and the rubber foot portions of the article to be constructed. It follows from these considertions that it is desirable that some more positive manner of joining be employed. I find that if the joint be made in the usual manner, by cementation and vulcanization, and this cement joint be re-enforced by a seam, stitched with a sewing-machine using a waxed thread and making an elastic stitch, the vulcanized rubber of the foot part A will "pack" the stitches, so that by this combination there will be made a perfectly water-tight and an elastic seam or joint of sufficient strength for the duty required. The back seam of the leg can also be so treated, if thought desirable. A series of metallic rivets or other like devices may be substituted for the sewing-machine stitches without, of course, departing from the spirit of the invention.

In the precise manufacture illustrated in the drawings, the foot portion A of the boot is composed of a cloth lining *g*, and an outer upper *m*, composed of cloth rubbered on both sides, the joining of said foot portion with the leg portion A being effected, as clearly seen at Fig. 3, by a sort of splice-joint, in which the lower portion B is embraced between the upper edges of the lining *g* and outer upper *m;* and in the process or mode of manufacture which I have so far successfully employed in making the improved article shown I have first lasted the cloth lining *g* (the outer surface of which is of course coated with rubber compound) in the usual and well-known manner, then applied the cloth

leg B to the last in a proper manner, with its lower extremity sufficiently overlapping the upper edge portion of said lining, and then applied to the last the vamp and quarter portions of the outer upper *m*, with the upper edge portion of said outer upper sufficiently overlaying the leg portion B, and finally, after the addition of the sole, subjected the united parts while on the last to the usual vulcanizing process to perfect the rubber-coated and joined parts.

The outer upper *m* of the foot portion A is shown as composed of a stout cotton cloth which has been first prepared by having a rubber compound "frictioned" into each of its surfaces, and a "calender" or second supplemental coating of rubber subsequently applied to that one of its surfaces which is to form the outer surface of the finished foot portion A.

It will be understood that in an article of foot-wear made according to my invention the portion B, having no layer or coating of rubber applied to it, may be sufficiently flexible to easily permit all the necessary relative movements of the leg and foot of the wearer, (at the vicinity of the ankle-joint,) and thus relieve the foot portion of all strains which the leg of an ordinary rubber boot throws upon it by reason of its stiff and unyielding ankle-section, and this while it, like a leather boot-leg, is sufficiently stiff to hold itself upright, and that hence that portion of the boot—*i. e.*, the rubber foot—may be made exceedingly light and will be at the same time exceedingly durable. Furthermore, not only may such an article of foot-wear be made much lighter and to much better fit the ankle and leg of the wearer, but it can be worn with greater comfort and be as easily put on and taken off, while at the same time, though not as perfectly water-proof throughout its whole extent, it is equally so with the ordinary rubber boot throughout that portion which is, as shown at A, made of combined rubber and cloth; and it may have its leg portion B made of such stuff that it will afford ample protection to the wearer where it may be necessary for him to walk or stand in water that would surround the said leg portion of the boot for a considerable time.

It is plain that for many kinds of service such a boot as shown will be found to be more desirable than one having a rubber leg portion, for the very reason that, unlike a rubber boot, the one shown and described has a leg portion that is more or less pervious to air, and therefore will not sweat the leg of the wearer, (be it worn with the leg portion B outside of or inside of the leg of the trousers,) while it is sufficiently impervious to water to satisfy the demands made upon it. Indeed, under the conditions or circumstances under which rubber boots are most frequently, or at least very frequently, worn, it is only necessary that the leg portion be capable of protecting the legs of the wearer against getting wet by rain and snow coming into contact with such portions, or to protect the surrounded leg portions of his trousers against the action of flying water and mud, and for all such purposes leg portions such as herein shown and described are quite as efficient as those of the ordinary rubber boot, especially if the portion B of heavy closely-woven cloth or other textile fabric be subjected to some waterproofing process or treatment, not involving, however, the application thereto of any rubber compound, and not operating to materially detract from the natural flexibility or impair the strength or durability of the fabric.

It will be seen that in a boot or shoe thus made with a rubber water-proof foot portion and a leg portion of some suitable lighter and much more flexible (but not gossamer-like) material the boot may fit properly and will not, like the clumsy rubber boot, rock up and down at the heel while being worn to the great discomfort of the wearer and the ruination of his stocking.

Of course the portion B, be it designed to be worn inside or outside of the trouser-leg, may be made of any desired length and may be finished at the top in any desired manner, and it will be understood that it is not material to my invention that the leg and foot portions bear just the relationship (as to the height of either) that I have shown in the drawings, it being quite practicable to make an article of foot-wear embracing the substance of my invention in which the line of union between leg and foot represented in the drawings at *e* may be somewhat higher or lower relatively than here shown, and instead of the boot-leg B there may be attached at about the same place and in the same way a Balmoral or other high shoe-top made to fasten by lacing or otherwise as closely around the ankle as is desired.

Perhaps it may scarcely be necessary to remark that my improved boot or shoe possesses a further advantage (under certain conditions of use) over any boot or shoe having its leg portion composed of any textile fabric treated with rubber in the usual manner to render it perfectly water-proof in the particular that it is not liable to snag or tear, it being a familiar fact to those skilled in the art of making cloth and rubber foot-wear that any textile fabric which has been rubbered and then subjected to the process necessary to vulcanize the rubber therewith combined has its character or quality so changed as to become much more sensitive to any breaking or tearing strain, this because such strain then becomes more localized and falls upon a single thread, while in the unrubbered cloth it is distributed upon many threads.

I wish it to be distinctly understood that I do not consider my invention limited to any precise style or pattern of boot or shoe so long as the article made involves the novel principle of construction of having all or part of its foot portion composed of vulcanized

rubber or rubber-treated textile fabric and all that part extending thence upward composed of some suitably strong and durable material that has the flexibility of the leg of a leather boot, while it has at the same time a certain amount of inflexibility that will distinguish it from a "gossamer" and that will stand the vulcanizing process necessary to the first-named portion of the article, but contains no rubber.

I also wish it to be distinctly understood that my invention should not be confounded with any of those things known in the prior state of the art which involve in the construction of the boot or shoe a foot portion composed of the usual rubber materials and the upwardly-extending or leg portion composed of felt or some other matter not involving the use of rubber, but which extends clear down and around the foot of the wearer of the article, and thus practically constitutes a complete covering for both the foot and leg, since in my improved article, while the foot portion is constructed after the usual fashion of rubber foot-wear, the leg portion, which contains no rubber, does not cover the foot of the wearer, but has its lower extremity strongly fastened, in a water-proof manner, to the upper edge of the rubber foot portion; and

All that I claim as new, and desire to secure by Letters Patent, is—

1. As an improved article of manufacture, a boot or shoe which comprises a foot portion made of materials such as usually employed in the manufacture of vulcanized-rubber foot-wear—such, for example, as rubber compound, or cloth and rubber combined—a separate leg portion composed of a suitably strong and durable material containing no rubber, but at the same time possessing sufficient rigidity to maintain itself like the ordinary heavy rubber boot-leg in an upright or distended condition when not in actual use, and means by which such separately and differently made foot and leg portions are united in a strong, durable, and water-tight manner, substantially as hereinbefore set forth.

2. In a boot or shoe, the foot portion of which is composed of materials such as usually employed in the manufacture of vulcanized-rubber goods for foot-wear, and the separate upwardly-extending leg portion of which is composed of some suitably strong and stiff fabric that does not contain any rubber, the combination, with the overlapping adjacent edges of the said foot portion and the said leg portion, of a cement seam and also a supplemental and positive fastening device, the said supplemental fastening device operating to effect a strong and durable permanent union of the said foot and leg portions, while the cementation of the seam operates to render the joint between said parts water-tight, all substantially as specified.

In witness whereof I have hereunto set my hand this 17th day of April, 1890.

E. A. SAUNDERS.

In presence of—
C. E. MERAMBLE,
EDW. D. LEARY.