

H.H. Day,
Rubber Shoe,
Nº 8,100, Patented May 20, 1851.

Fig 4.

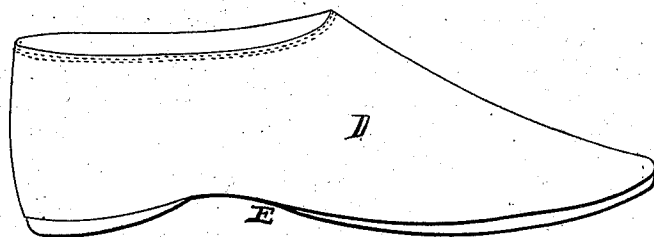


Fig 2.

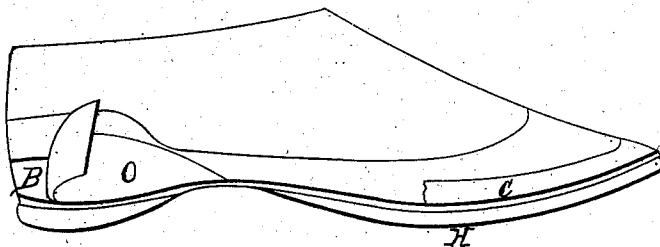


Fig 1.

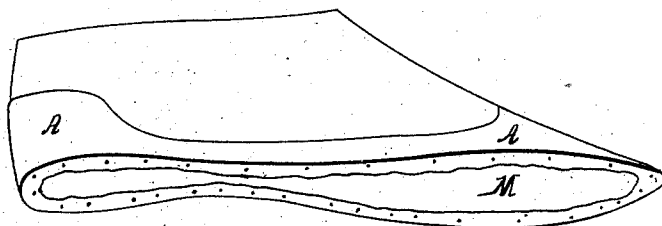
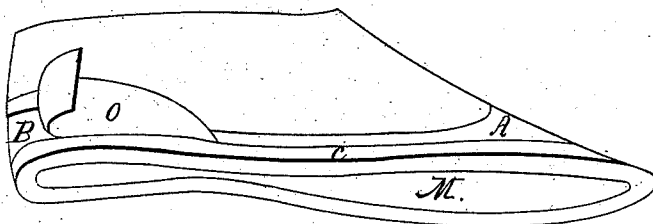


Fig 3.



UNITED STATES PATENT OFFICE.

HORACE H. DAY, OF JERSEY CITY, NEW JERSEY.

INDIA-RUBBER SHOE.

Specification of Letters Patent No. 8,100, dated May 20, 1851.

To all whom it may concern:

Be it known that I, HORACE H. DAY, of Jersey City, in the county Hudson and State of New Jersey, have invented a new and useful Improvement in Elastic Overshoes; and I hereby declare the following to be a full and exact description of the same.

The nature of my invention is the peculiar arrangement and combination of known materials to be used in the manufacture of shoes suitable for men, women and children, principally as overshoes; by which means I produce shoes having new and useful qualities, never before obtained, and at a less cost than any, known before my invention. The material principally used is india rubber, although a tolerably good result may be obtained from some of the preparations of gutta percha, and the best from a combination of india rubber and gutta percha, properly prepared, and the whole vulcanized. The preparation and treatment of rubber or gutta percha forms no part of my present claim. The shoe made by the Indians of Brazil is clumsy, and the inequalities of elasticity are due solely to the different thicknesses of the different parts. By my method, the inequality of elasticity is due mainly to the combination and disposal of materials prepared with different degrees of elasticity, and all much less ductile than india rubber, which is not in its natural state well adapted to the formation of a shoe.

The shoes heretofore made in the United States from sheets of rubber alone, have been strengthened by increasing the thickness of the parts required more firm, by adding parts of the same degree of elasticity, by which means the shoes have been both expensive and clumsy, or if light, not sufficiently strong to be durable.

My improvement obviates these, among other difficulties, and prevents to a great extent the objection of "cutting through" on the bottom. I am aware that shoes have been attempted to be made elastic and strong, by interposing between india rubber sheets of same degree of elasticity, cloth or threads, and when thread or narrow tape has been used, the spaces between the disconnected tape or thread would yield the spring. By this arrangement which was never successful, the elasticity or spring, was extended all over the shoe, both where it was wanted and where it was not wanted,

and the firmness of the part over which the tape or thread passed prevented any spring on such part, which was also found to cause breaks, or the giving away of the rubber at the point of junction.

By my method a uniform elasticity in every direction is obtained all over the shoe, and different degrees in different parts, and as no cloth or thread is used, there is no weak place or part to break, or give out before the other. By all these processes, the shoes have been found to possess so many objectionable qualities as to go into disuse, and the best and only successful mode now remaining, is to combine rubber, or the other elastic preparations with cloth, or woven or braided fabrics, or leather, and by the arrangement and combination of these produce a shoe having firmness and elasticity disposed in different parts; but in none of these are the shoes made to stretch in all directions; and by all the soles are quite firm and inelastic, and the shoes are otherwise objectionable as now made. Shoes formed by combining a lining of cloth to cover a part, or the whole of the inside of the shoe, soon become dirty, and the cloth from frequent wetting becomes rotten, leaving weak places in the rubber, or other elastic preparations. They cannot be turned inside out, without breaking, or tearing the threads or cloth, or the rubber, and therefore cannot be readily washed, and rapidly dried, and the necessary expansion in putting on and off produces an undue strain upon the points where the inelastic cloth and elastic preparation meet, causing the shoe to be torn or break at those points, or to become so weak as to lose their shape and become loose and unsightly upon the foot.

Shoes made according to my plan have no thread, tape, cloth or leather in them to be broken, wet or to hold dust or dirt, every part has some elasticity in every direction, and allows among other advantages, the turning inside out, to wash, and dry, without breaking tearing or destroying the shoe, yet preserving all the required firmness and ductility in the parts exposed to most strain and wear, as well as throughout the shoe which it retains. By my method they will also clasp close to the boot or shoe upon which they are worn, and when stretched in one part, will contract at others, to make a more perfect fit than can be obtained by any other known means; without being obnoxious to

the objectionable qualities of other kinds which possess in any degree this quality. For instance, if a No. three shoe made on my plan, is a little too short and too wide for a person who wears No. four, the spring of the sole being mostly in the shank, it will elongate without perceptible injury to the strength and firmness at the heel, and on the ball, and having no cloth in the upper or sole, will contract sufficiently in width while the firm part will always be adjusted at the point most exposed to wear, without weakening those parts. Again shoes made according to my plan, having any desirable elongation, and lateral expansion in all the parts, and being vulcanized or otherwise treated to possess permanent elasticity, may be adjusted to different boots or shoes, over which they may be required to be worn by the same person at different times, without being injured or rendered unfit for a smaller shoe, and without causing any breaking of the fibrous materials added in other shoes to give firmness and inelasticity, and are therefore more economical.

By my invention the quality of cheapness will be found one of great importance to manufacturers. When cloth linings and cloth stays are used to impart firmness, or for other purposes in the manufacture of shoes, the cuttings and waste amount to from one quarter to one third of the cost of the prepared cloth leather or such article as is used; while by my method not one ounce of material need be wasted in the manufacture of a thousand pairs of shoes all the clippings being worked over, and yet the exact strength and firmness can be disposed upon those parts exposed to the strain, and wear, and the shoe rendered light and elegant, yet firm strong and easy to the foot.

The facility of putting on and off my shoe without squeezing the fingers, tearing off the nails, or tearing the shoe, is of itself a quality of great importance and economy and which has never been possessed by any shoe having the other distinguishing qualities of mine.

To enable others skilled in the manufacture of india rubber or gutta percha to make my improvement, I describe the combination and arrangement, which I find most convenient and economical.

All the materials are first to be manufactured into sheets of such thickness as may be found desirable, (and according to the modes known to manufacturers of india rubber and gutta percha;) and for the purpose of brevity, I number the sheets, No. one, No. two, No. three, No. four. No. one should be the most elastic, and so made as to stretch about three or four times its quiescent length, when cut into strips and vulcanized before it will break. No. two should be so made that it will stretch about

twice its quiescent length. No. three should be still firmer, say to stretch when cut into strips and vulcanized, once its quiescent length. No. four should have much less spring than either of the others, say from five to fifteen per cent. of its quiescent length. These all being ready, I procure shoe lasts of the proper size, and form, which may be made without "blocks." I cut from No. two or No. three an insole M, and tack it fast to the bottom of the last, pressing it down to conform to the rounded form of last. I next cut what for facility of description I will call the lining A from No. two or No. three. This I usually cut of such size and shape as will extend up the side and over the toes about one to three inches, according to the size and kind of shoe, see letter A, in Fig. one this may be cut with a seam at the side, or at the heel, and being fitted to the last, is lapped about half an inch on to the insole, to which it immediately becomes attached by pressure. The tacks are then withdrawn from the insole, and any fold skived off with a wet knife. I then cut from No. four a stiffening which should reach about half an inch more or less from the insole up the side of the last, at the heel, this being stuck fast, another larger piece O cut from No. three or four, is put over the first, extending from the heel to the shank and lapping about a quarter of an inch on to the insole and extending up the heel as high as it may be desirable, to give firmness and stiffness to the heel see O in Figs. two and three. I next cut from No. three or four a middle piece C Fig. 3, which I will call "side strip." This should be attached to the lining extending from back of the big toe joint around the toes, and back to the hollow or shank, lapping on to insole, and on to lining, more or less according to the fancy of the maker, and the extent to which additional firmness may be required. I then after rolling these fast to the insole, to which they are firmly united, extending more or less, (half an inch will do) skive off the projections, and cut from No. three or four a sole H see Fig. 2 to extend from heel to toe, except say two or three inches in the shank, attach and sole fast. The shoe is then ready for the outside or upper D Fig. 4 and sole E. I cut from No. one a piece large enough to form the entire upper, turn over the upper edge, or adopt any other well known mode of binding, to which binding I make no claim. This is to be placed on the last over the other pieces, and lap on the bottom about half an inch, more or less. I then cut an outsole E Fig. 4 from No. one two or three, and stick fast, and being well rolled, or hammered, the stitching iron may be applied in the usual way, when the shoe still remaining on the last,

is submitted to heat for vulcanizing, and is then ready for market. It is evident that these different materials may be disposed and combined together in various ways to produce the requisite different degrees of elasticity for the different parts of the boot or shoe. That described will serve to give a workman sufficient instructions to use my improvement.

To prepare No. one or No. two is so generally well known and understood by those accustomed to manufacturing and vulcanizing rubber, and gutta percha that no particular description need be given.

The sheets No. three or No. four I prepare by combining a large quantity of whiting or similar cheap material with the rubber or gutta percha, and other materials necessary in vulcanizing—or I combine rubber and gutta percha together say—one part of gutta percha to one and one half of rubber, or I combine fibers of cotton, or linen to be ground up with the rubber or gutta percha, or with both.

The preparation or manufacture of these, form no part of my present claim, and is only referred to, to give a more full description of the means, used by me, to obtain the different degrees of elasticity.

My invention is intended to cover the use of any or all of these when used in combination for the purpose of my shoe.

Shoes made according to my discovery have the following advantages over those heretofore made:

1. They can be produced at nearly one half the cost of any other manufactured shoe. There need not be a pound of waste in a thousand pair of shoes, whereas in all other manufactured rubber shoes, the waste in cutting linings and stays, stiffening, &c., is a large item of expense, in loss of leather or cloth and the rubber attached to them. My shoe can also be made much faster than any other kind, and altogether by girls and boys.

2. They are not liable to break and tear as those do, the uppers of which are part cloth, or stays of thread, leather and other fibrous fabric; for at the joining parts of such with the rubber, the strain on the rubber frequently causes a tear or rent, at the points of junction, or the cloth or threads become wet, mildewed rotten and hence produce weak places which soon yield to pressure.

3. My shoes can be turned inside out and washed clean, without breaking or tearing

the same, while those heretofore made cannot be turned without liability of breaking or tearing the rubber, or the cloth which forms a part of the shoe.

4. The dispensing with the use of all linings or cloth stays, insoles, &c., produces a very light shoe, leaves no lodging places for mud and dirt, or dust which frequently renders the inside of other manufactured rubber shoes liable to soil the upper of the boot or shoe over which they are worn consequent upon the use of cloth linings.

5. They can be easily put on and off without straining or wrenching the fingers, and can be made to fit the exact shape of the boot while the elasticity given to the shank, and different degrees of elasticity in other parts will cause a perfect fit about the heel, and toe; and the arrangement of the upper allows the same across the foot.

6. The shoe made by my method will admit any desirable elongation and lateral expansion in all its parts, to adjust to different boots or shoes, over which it may be required to be worn by the same person at different times, while that part exposed to the most wear will always be in the right position, over the different boots or shoes—thereby affording convenience and economy to the wearer.

Having described the advantages of my improvement and the best way known to me of manufacturing the same, what I claim as my invention and desire to secure by Letters Patent, is—

The manufacture of rubber boots and shoes without cloth being made of separate pieces of different degrees of elasticity, and each piece having its peculiar and requisite degrees, the shoe, to possess different degrees of elasticity in different parts, and uniform elasticity in each different part, and having no part without some elasticity in every direction, by the means herein described, or any other substantially the same whereby I lessen the cost; obtain a shoe not liable to break; which can be kept clean; stretched in every direction at the same time; easier to the foot; adjustable to larger boots, and yet not rendered useless to wear over smaller; light and elegant and retain permanently their shape.

HORACE H. DAY.

Witnesses:

D. WYCKOFF,
WM. H. ROGERS,
JOHN H. VOORHEES.