Oct. 31, 1933. E. MEUCCI 1,932,557

FOOTWEAR WITH ELASTIC, FLEXIBLE, AND AERATED SOLES EMBODYING RUBBER SPONGE

Filed June 6, 1931 2 Sheets-Sheet 1

Fig. 1

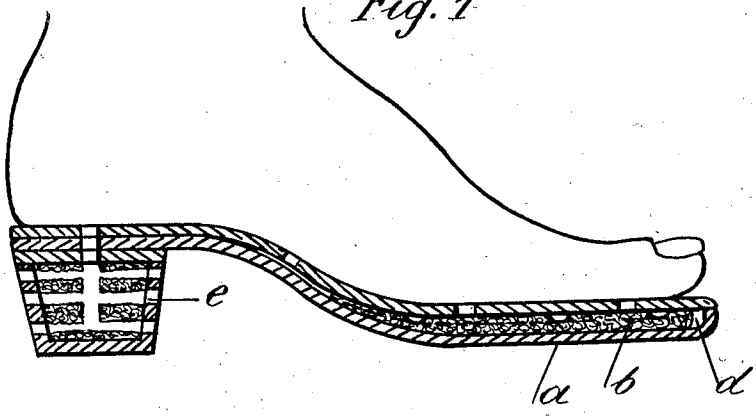


Fig. 2

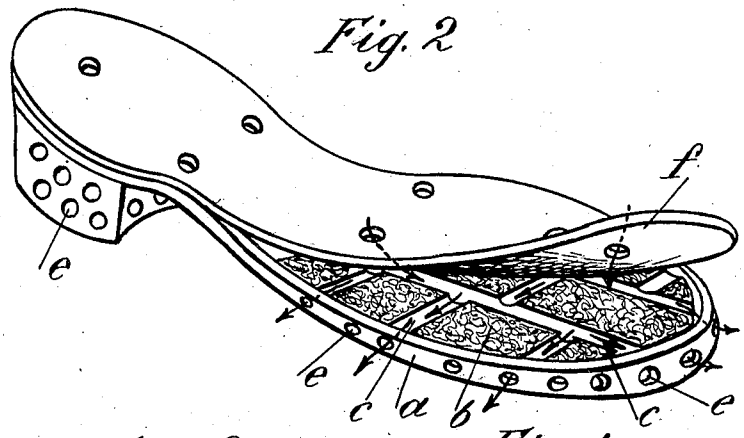


Fig. 3

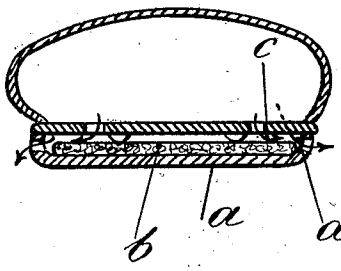
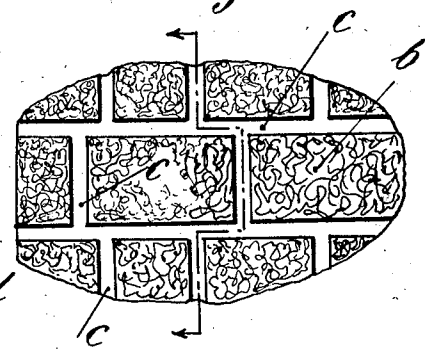


Fig. 4



Enrico Meucci
INVENTOR;
by Atty
his Attorney.

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Fig. 5

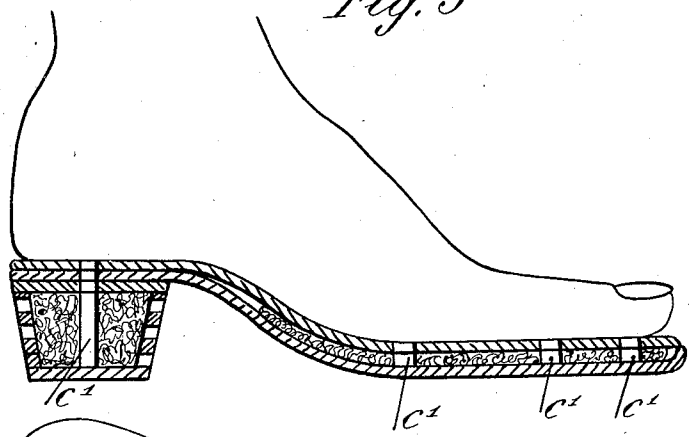


Fig. 6

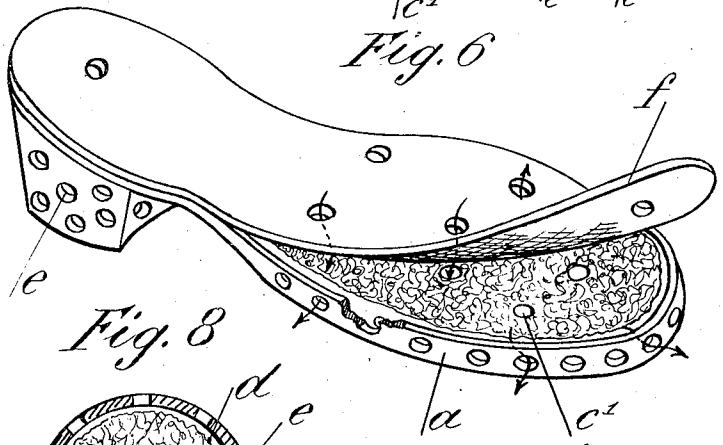


Fig. 8

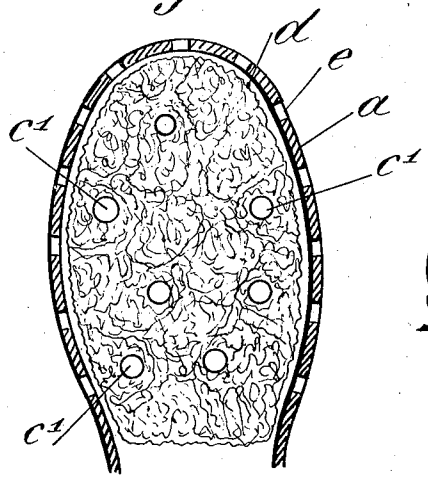
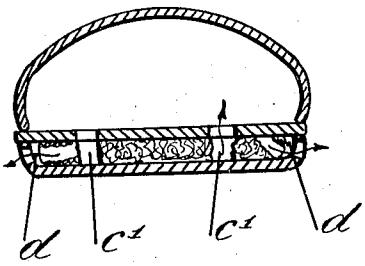


Fig. 7



Enrico Meucci
INVENTOR;
By Otto Munk
his Attorney

Patented Oct. 31, 1933 1,932,557

UNITED STATES PATENT OFFICE

1,932,557

FOOTWEAR WITH ELASTIC, FLEXIBLE, AND AERATED SOLES EMBODYING RUBBER SPONGE

Enrico Meucci, Florence, Italy

Application June 6, 1931, Serial No. 542,551, and in Italy September 19, 1930

3 Claims. (Cl. 36—3)

The invention relates to a new system of footwear, characterized by the fact of its being elastic and aerated, these two qualities being ensured through the use of rubber sponge or of any other suitable material or sponge, such material being utilized both for the attainment of elasticity, that is, resiliency of the sole, or rather of a soft support for the foot, and also—if desired—of aeration.

Essentially, the invention consists in pre-arranging in combination with the sole of the footwear, i. e. inside the sole or on the top of it, a layer of very soft material, such, for instance, as rubber sponge, which imparts the quality of elasticity. At the same time, the special characteristic feature of the rubber sponge or other similar material or sponge—which is that of being formed of a series of deep hollows or cavities, upheld by small walls of rubber or the like—allows of obtaining, if so desired, the aeration within the sole proper, within the heel and inside the shoes themselves, said cavities being combined with a series of passages, vertical orifices or small horizontal channels connected with the interior of the boot or shoe, the sole, the heel and the filling or elastic support of the latter and with the outside.

The cavities of the elastic filling—made of rubber sponge or the like—laid or arranged within empty spaces beds or seats formed in the sole—are as close together as possible for the purpose of constituting an air passage, orifices being furthermore provided to correspond with said filling both in the interior of the footwear and at the bottom thereof—corresponding to the tread and the heel—and peripherally as regards the sole.

The invention will be more precisely understood on reference being had to the accompanying drawings, wherein are shown a few examples of its application, all relating to the case of a sole having been rendered elastic with rubber sponge or the like, and aerated, i. e. a sole in communication with the atmosphere.

In these drawings—

Fig. 1 shows the vertical section of a sole with a heel provided with aerated elastic means, as a first type;

Fig. 2 shows in a perspective view the plan of the shoe with a part of the upper covering raised, of the same type;

Fig. 3 is a cross section of a shoe according to the case illustrated in Fig. 1;

Fig. 4 shows, separately, the plan of the elastic part of the above-indicated type;

Fig. 5 shows the vertical section of the sole of a shoe according to a second type;

Fig. 6 shows said sole perspectively with the covering partly raised;

Fig. 7 is a cross section of the shoe according to the case referred to in Fig. 5 and

Fig. 8 is a plan view of the sole according to Fig. 6.

In correspondence with the first example delineated in Figs. 1–4 inclusively, the sole proper *a* is formed with a bordering all round, as will be more clearly seen in Fig. 3. Within the space produced by this bordering or rim a slab *b* of elastic material such as rubber sponge or the like is laid, crossing channels *c*, may be previously traced. This slab of rubber *b* may possibly not adhere quite perfectly to the bordering of the sole *a* and prove slightly narrower so as to leave a small empty space or channel *d* all around.

The border of the sole *a* is provided laterally with orifices *e* throughout which register with the empty space *d* all around said border. In this empty space terminate the channels *c* of the elastic material, whenever such are formed on the latter; in any case it is here that terminate the openings of the cavities of which the rubber sponge is composed.

On the top of this sole as described there will be laid a covering or small under-foot sole *f* of any soft material such as kid, linen or the like—instead of one of the usual inner soles of leather—especially if of dry leather—which latter material is too stiff. This inner sole is also perforated, and through such perforations the air may freely circulate inside the sole through the channels *c* and outside through the orifices *e*. Said small sole is sewn to the shoe upper. Perfect aeration within the boot or shoe and elasticity are thus ensured.

The case according to Figs. 5 to 8 inclusively, differs only in that the channels inside the elastic mass—rubber sponge—are in a vertical direction instead of horizontal. In fact, as appears especially from Fig. 7, the channels c^1 are vertical there, that is, they pass through the rubber sponge from one side to the other. Thus, the air will always find a way of penetrating into the cavities, there being several channels c^1, so that no zone of the mass of rubber sponge even if separated by walls of rubber constituting a solution of continuity of each zone, will be left with a mass of stagnant air. Even should some zone or other remain isolated, no specific damage to the system would ensue.

The concept already set forth, which is that of providing or pre-arranging within the footwear that which constitutes the essential characteristic of the invention, to wit, the layer of elastic material for the providing of a soft and springy support for the foot (which layer is essentially indicated as being formed of rubber sponge or the like) may be carried out in various ways.

In order to put to application the invention it is in fact sufficient, that is, necessary, to furnish the sole of the boot or shoe with a lateral border or rim so that the slab of soft, elastic material consisting of rubber sponge may be laid in the space or bed created by said bordering.

In the examples already described this fact has been generically stated, two examples having been indicated as to the mode of forming this empty space.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:

1. An article of footwear comprising an outer sole having a wall containing perforations communicating with the atmosphere and a pocket at the upper face of the sole, a body of sponge rubber in said pocket and having a plurality of cavities for the passage of air therethrough, and an inner sole covering said sponge rubber and having perforations, whereby air may circulate between the exterior and interior of said article of footwear.

2. An article of foot wear comprising an outer sole having an orificed upturned marginal wall, a body of sponge rubber on the upper face of said sole within the confines of said marginal wall, said sponge rubber having channels communicating with the orifices in the marginal wall, and an inner sole covering said sponge rubber and engaging the upper edge of the marginal wall, said inner sole having perforations therethrough, whereby air may circulate between the exterior and interior of said article of footwear.

3. An article of footwear comprising an outer sole having an orificed upturned marginal wall whereby a pocket is formed at the upper face of said sole, a body of sponge rubber in said pocket with the edge of the body spaced from the inner face of the upturned marginal wall, said sponge rubber having channels communicating with the orifices in the marginal wall, and an inner sole covering said sponge rubber and engaging the upper edge of the marginal wall, said inner sole having perforations therethrough, whereby air may circulate between the exterior and interior of said article of footwear.

ENRICO MEUCCI.