

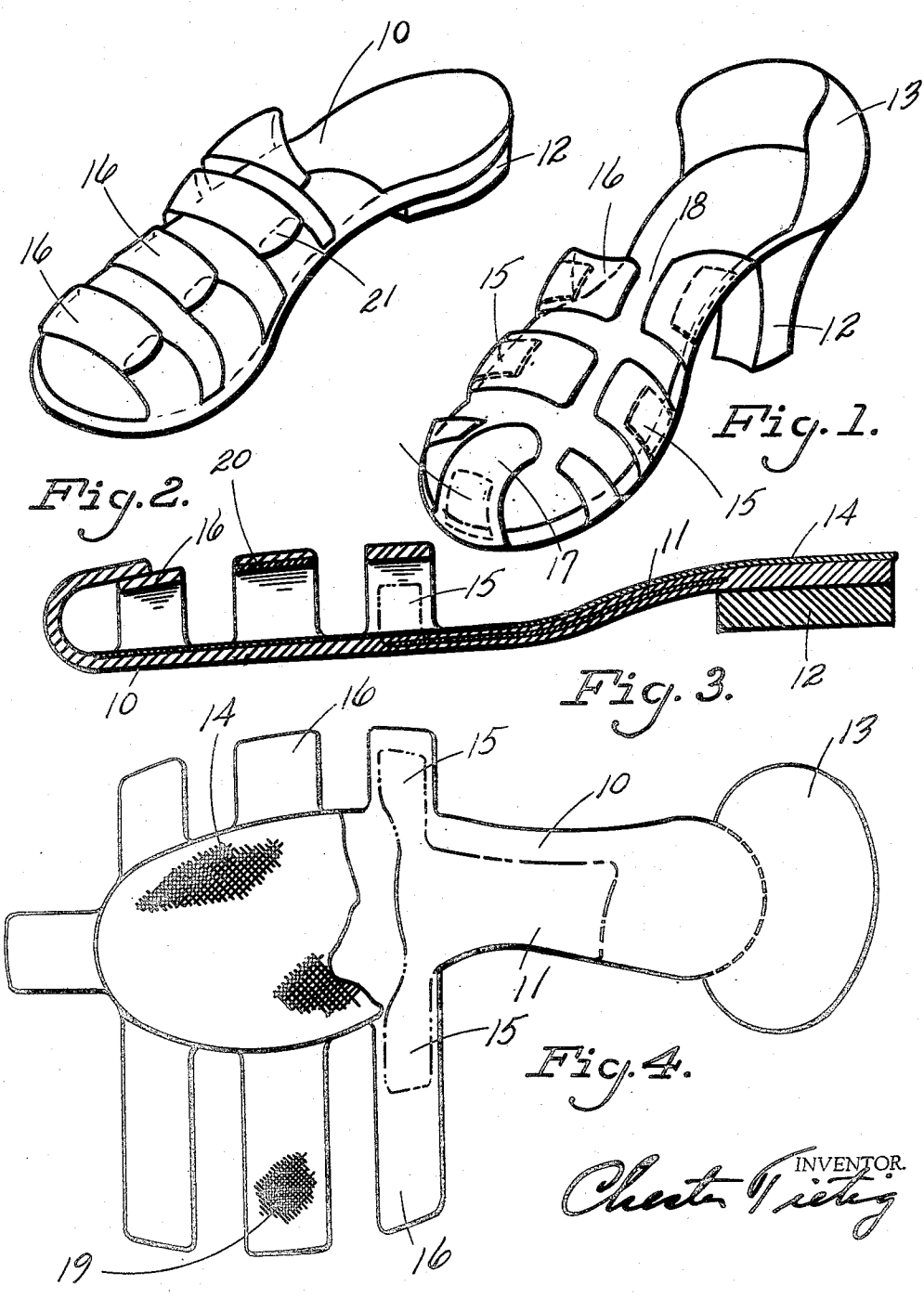
April 22, 1941.

C. TIETIG

2,239,206

PLASTIC SHOE

Filed July 12, 1939



INVENTOR  
*Charles Tietig*

# UNITED STATES PATENT OFFICE

2,239,206

## PLASTIC SHOE

Chester Tietig, Covington, Ky.

Application July 12, 1939, Serial No. 284,063

6 Claims. (Cl. 36—11.5)

This invention relates to a shoe made from plastic material.

Among the objects of the invention is to provide a shoe which will grip the wearer's foot with a degree of pressure which is sufficient to hold the shoe on tightly but insufficient to cause discomfort. Another object is to provide a shoe which is easy and quick to manufacture and which costs less than a leather shoe. A third object is to provide a molded metallic arch support interior of the sole. A fourth object is to provide a shoe of striking appearance which is readily colored by dyes incorporated into the plastic mass and which is transparent and therefore adapted to show the wearer's foot.

In the drawing, Figure 1 shows the preferred form of the invention.

Figure 2 shows a low-heeled form in which the bands or straps across the foot are fused or otherwise sealed together.

Figure 3 is a lengthwise section of the shoe which is shown in Figure 2, said section showing an incorporated arch support.

Figure 4 is a shoe according to my invention, said shoe being in flat form, i. e., not folded to conform to the wearer's foot. Figure 4 represents a stage or intermediate product in the manufacture of my shoe.

The plastic material which I prefer to use for making my shoes is the vinyl polymer of one of the vinyl halides probably vinyl chlorides, said polymer being known as "Koroseal" and manufactured by the B. F. Goodrich Company. The grade of "Koroseal" which I prefer to use is known as 117, it being so designated by the manufacturers. My invention is, however, not limited to this material. Harder grades of "Koroseal" may be used and entirely different plastics can also be employed. Another such plastic is methyl methacrylate (Lucite, Luxene). Another is cellulose acetate (Tenite). Another is polyvinyl acetal. Still other suitable materials are monomeric methyl acrylates, such as butyl, amyl, lauryl, stearyl, interpolymerized with methacrylate ester, vinyl compounds, butadiene or styrene. Still other equivalents are the polystyrols manufactured and sold commercially by the Dow Chemical Company of Midland, Michigan. To each or all of such materials, plasticizers may be added to promote flexibility. Such compounds and mixtures are very well known to the art and it lies within the skill of any competent plastics chemist to add such stabilizers in suitable amounts to get required degrees of flexibility.

The shoe shown is made of a sole 10 which is

made of one of the resins named. The sole preferably encloses a metal shank or arch support 11 which is preferably molded within the sole as shown in Figure 3, however, it may be omitted. A heel 12 may be made of a different material than the sole and may be cemented thereto or it may be of the same material of and integral with the sole. A counter 13 may also be integral with the sole. Above the sole 10 and adherent thereto there is preferably a cloth covering 14 extending completely over the sole and heel. This cloth is made preferably of cotton which will stand the molding temperatures although other suitable textiles may be used.

As shown in Figures 4, 3 and 1, the metallic arch support 11 may have extensions or fins 15 which curve about over the foot. Such fins are embedded in bands or straps 16 which are made of the same plastic and are integral with the sole. A toe-cap 17 may also be so integral. The preferred method of manufacture is to first make a blank or flat shoe such as shown in Figure 4 and to bend the blank in a mold or over a last at a temperature at which the plastic begins to soften. The function of the metallic fins 15 are to assist the plastic bands to conform to and to grip the foot, thus causing the shoe to give quite substantial support. The fins may be omitted if desired.

Referring to Figure 1, this shoe is open along the top of the vamp, this open space being designated 18. It is intended that this open space coincide with the bony ridge down the top of the human foot, this ridge being further toward the inside of the foot than toward the outside. Such a shoe requires no lace. However, eyelets or holes and the usual laces may be provided if desired. The counter 13 is also molded around the last from the flattened counter integral with the sole shown in Figure 4.

The sole 10 as well as the bands 16 may have incorporated into the composition from which they are made from 1% to 25% by weight of textile fiber or asbestos fiber. I prefer to use cotton fiber of an average length of about  $\frac{1}{8}$ ". Wool fiber (shoddy) may also be used. The textile or asbestos fiber has the advantage of hindering the transmission of heat through the sole of the shoe.

The cloth inner sole 14 may also extend to the inner side of bands 16 as shown at 19 on Figure 4.

While no invention is claimed for the use of rubber in making shoes, nevertheless, it is within the purview of my invention to make a rubber

shoe, i. e., the rubber being used in place of the named plastics, when my specific construction of shoe is used, provided such construction lies within the scope of the following claims.

As shown in Figure 3 there may be a number of cloth layers 20 interspersed with layers of flexible plastic making up both the bands 16 and the sole, the two being integral.

In this specification and the appended claims the term "molded" is to be interpreted broadly enough to include the hot or cold pressing of a powder or a syrup in a mold to harden or consolidate same, but also to include the pressing together to adhesion of already formed sheets of plastic material, said adhesion being either to textiles or to another plastic sheet of the same character.

Referring now to Figure 2, at 21 it is shown that the bands 16 may be attached to each other at their ends by fusing or cementing so that a longitudinally closed shoe is produced. Although a lap junction is shown, a butt junction is regarded as being equivalent.

An equivalent for the cloth covering 14 is paper or a felt covering.

My shoe may be fitted to the human foot by heating the shoe to the softening point of the plastic and pressing the shoe manually or otherwise about the foot of the person who is to be the wearer and allowing the shoe to cool while so pressed.

I claim as my invention:

1. A sandal comprising a sole of a tough thermoplastic material of limited flexibility at ordinary temperature and bands of the same material curving upwardly and inwardly from said sole and being integral therewith, for enclosing the forward portion of the human foot by the inherent resiliency of the material in the bands.

2. A sandal comprising a sole of tough synthetic resin thermoplastic material of limited flexibility at ordinary temperature and a plurality of bands comprising the same material curving upwardly and inwardly from said sole and being integral therewith for enclosing the forward portion of the human foot by the in-

herent resiliency of the material in the bands, an arch support enclosed by said sole and a plurality of fins extending from said arch support into said bands.

3. A sandal comprising a sole of a tough thermoplastic material of limited flexibility at ordinary temperature and bands of the same material curving upwardly and inwardly from said sole and being integral therewith, for enclosing the forward portion of the human foot by the inherent resiliency of the material in the bands and an inner sole of textile material extending over at least as much of the inner surface of said sandal as the sole and being adherent thereto.

4. A sandal comprising a sole of a tough thermoplastic material of limited flexibility at ordinary temperature and bands of the same material curving upwardly and inwardly from said sole and integral therewith for enclosing at least the forward portion of the human foot by the inherent resiliency of the material in the bands, said synthetic resin material comprising a polyvinyl halide.

5. A sandal comprising a sole and bands of the same material as the sole and integral therewith, said bands curving upwardly and inwardly from said sole for enclosing the forward portion of the human foot by the inherent resiliency of the material in the bands, said sole and bands being built up of a plurality of textile sheets interspersed with at least one layer of a tough thermoplastic material of limited flexibility at ordinary temperature.

6. A sandal comprising a sole of tough thermoplastic material of limited flexibility at ordinary temperature and bands of the same material integral with the sole curving upwardly and inwardly from said sole and enclosing the forward portion of the human foot by the inherent resiliency of the material in the bands, a heel integral with said sole, a counter also integral therewith and being also adapted to assist the retention of the sandal on the wearer's foot by the resiliency of its material.

CHESTER TETIG.