

March 7, 1944.

M. D. PICKENS ET AL

2,343,700

SHOE

Filed April 22, 1943

Fig. 1.

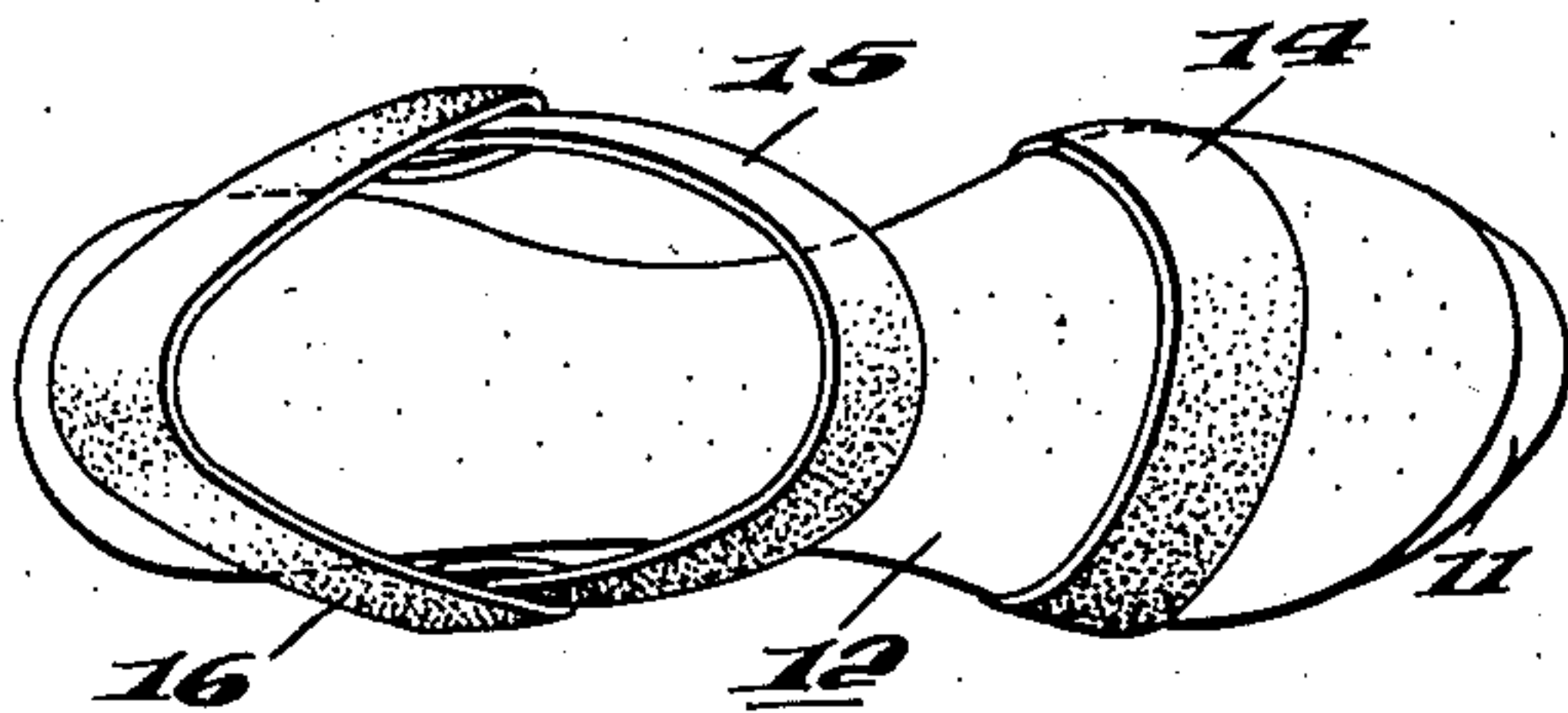


Fig. 3.

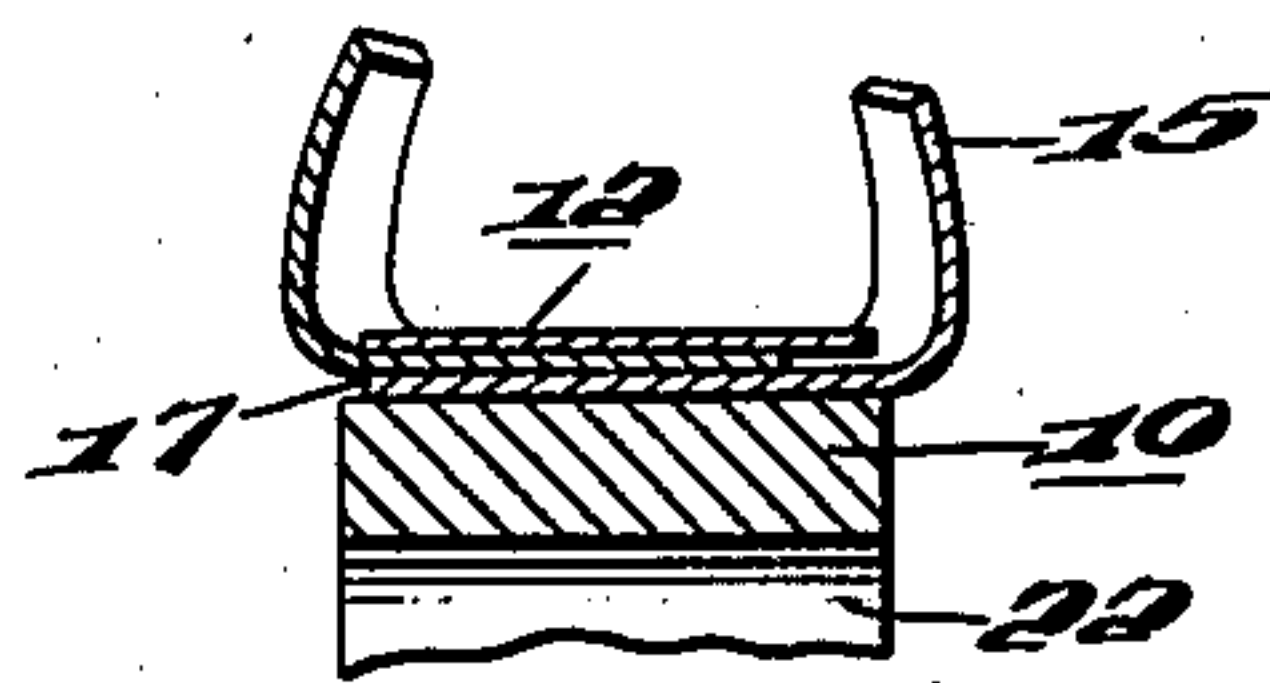


Fig. 2.

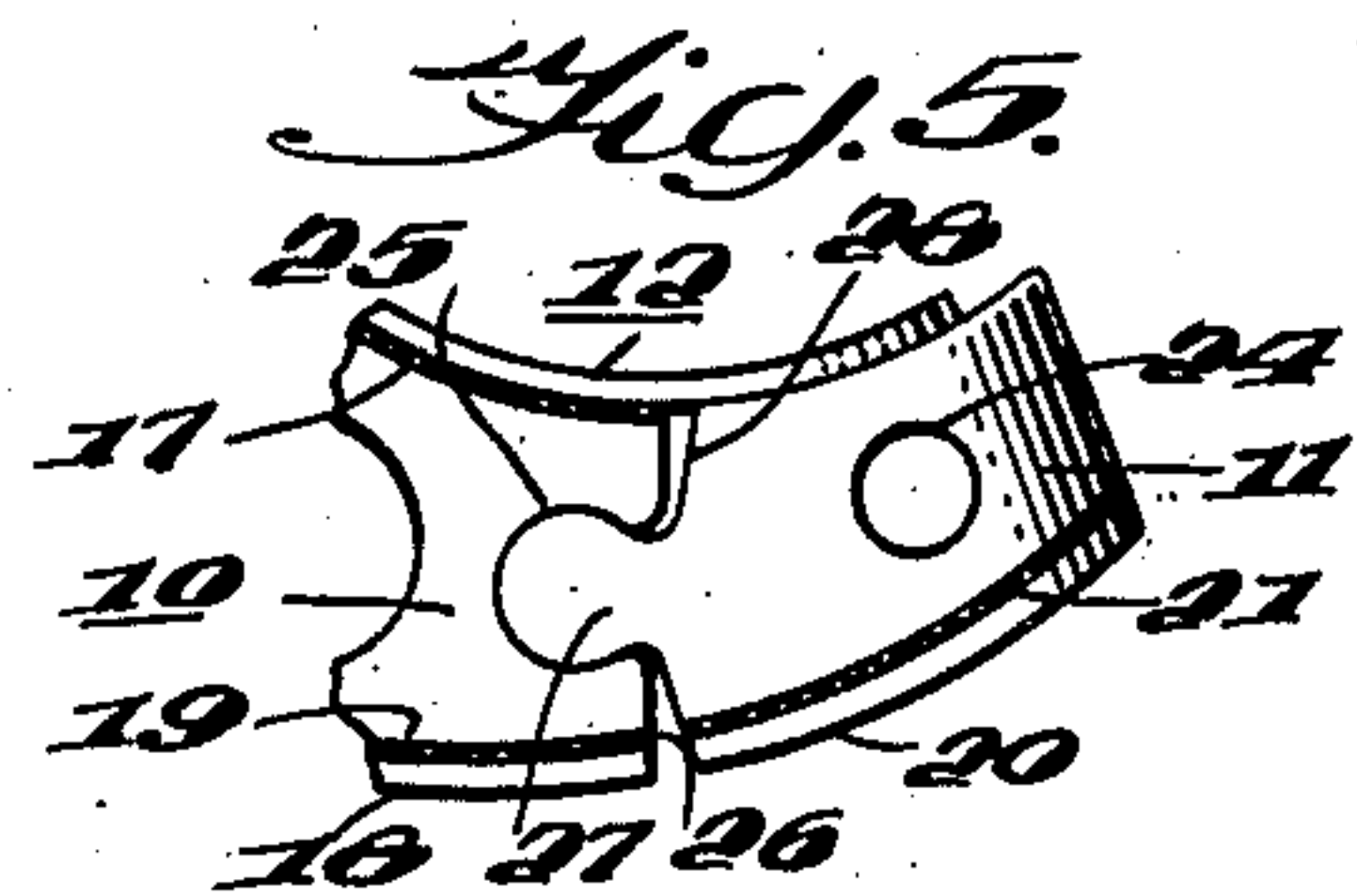
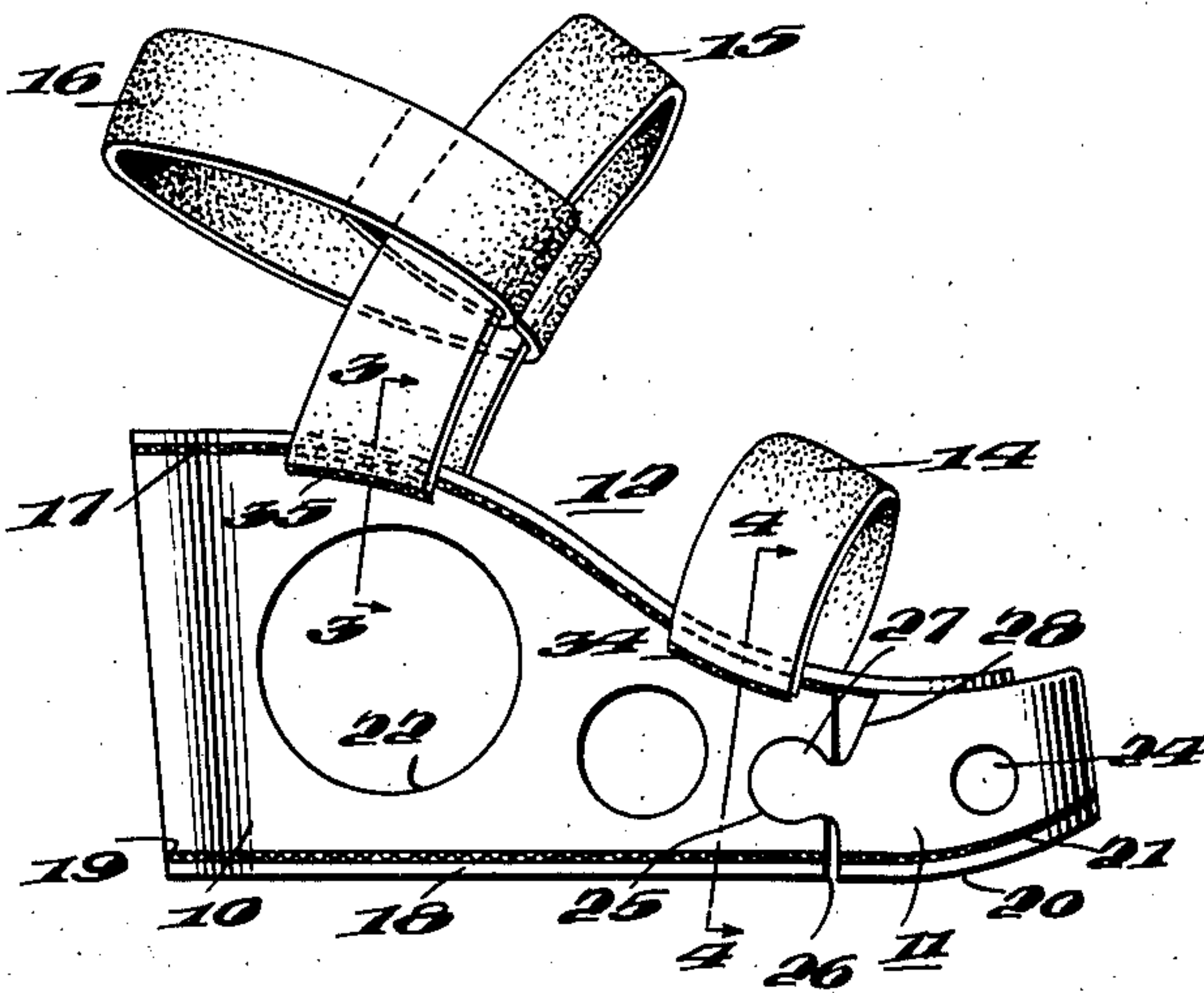


Fig. 4.

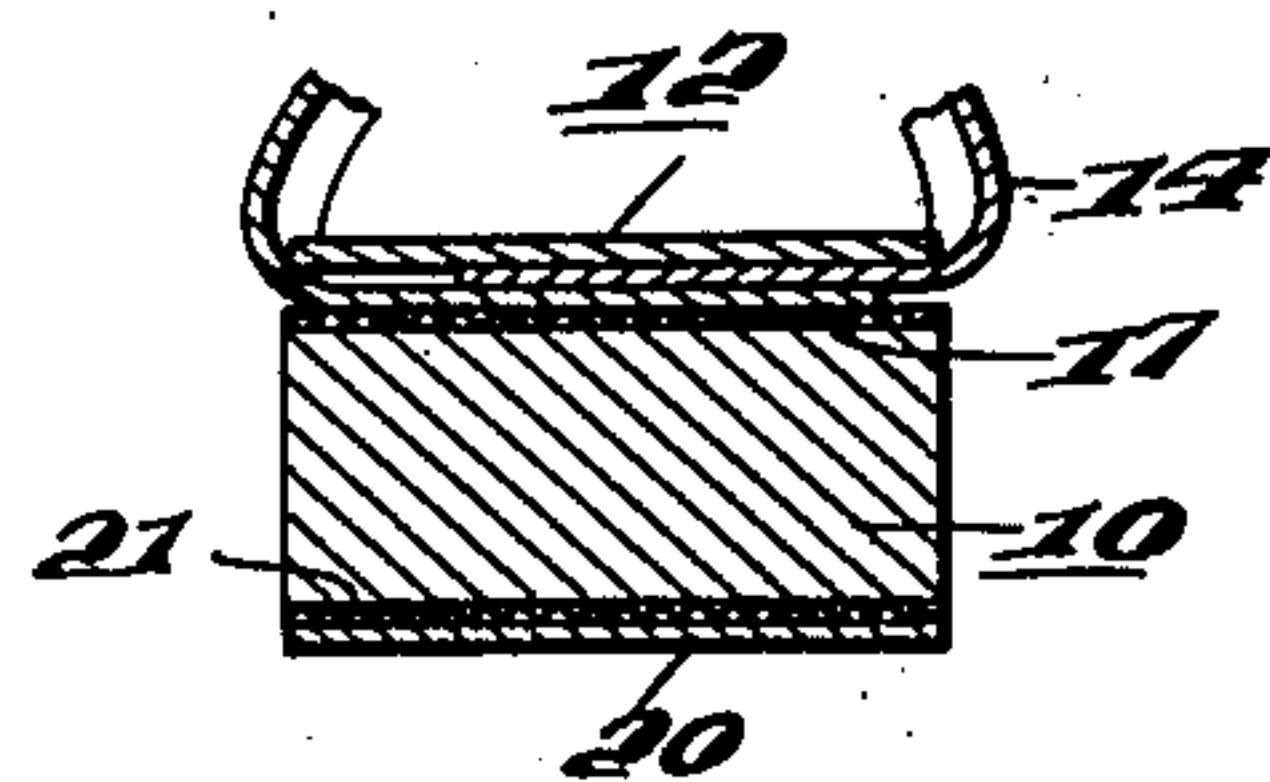


Fig. 6.

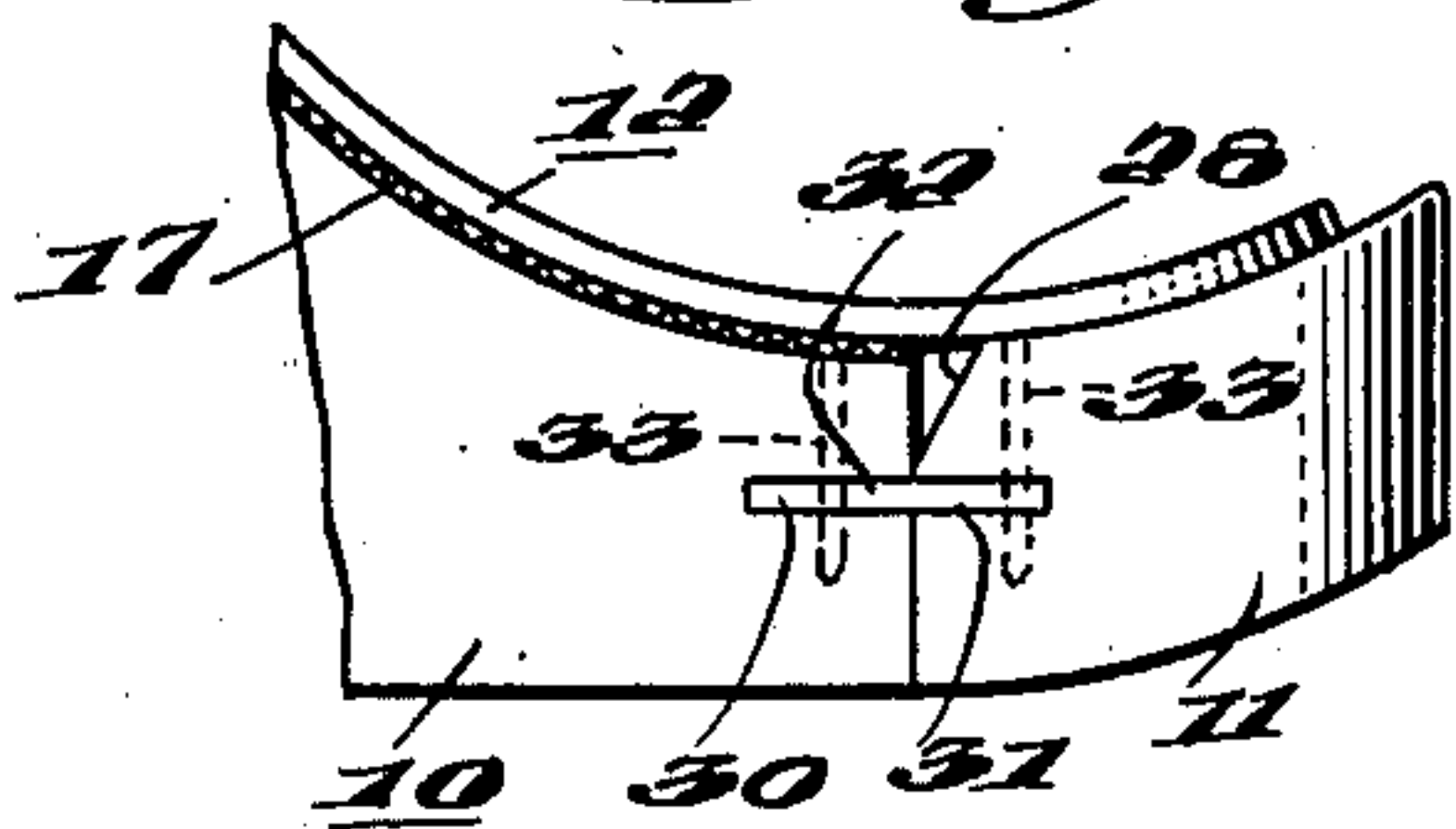


Fig. 7.

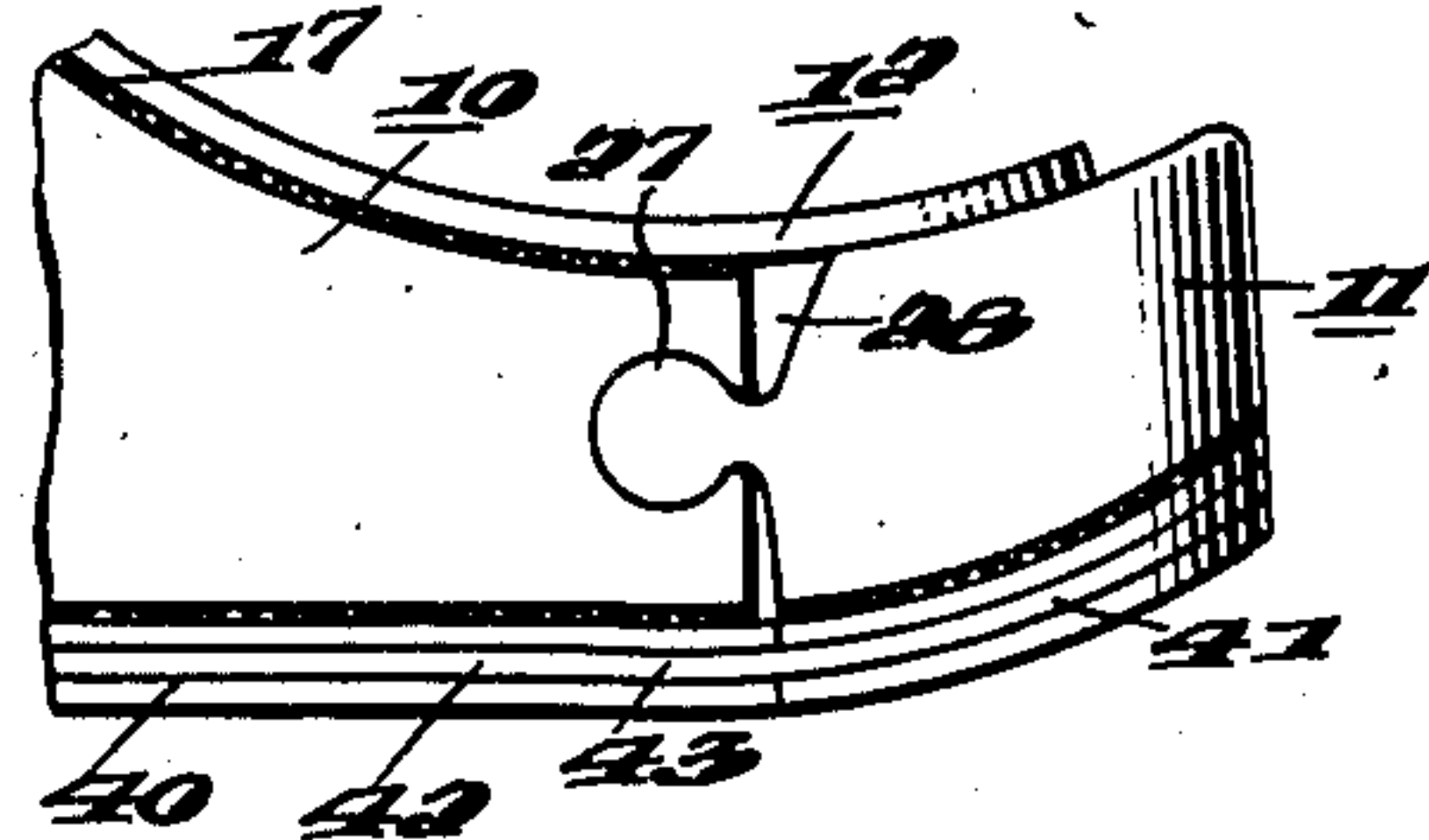
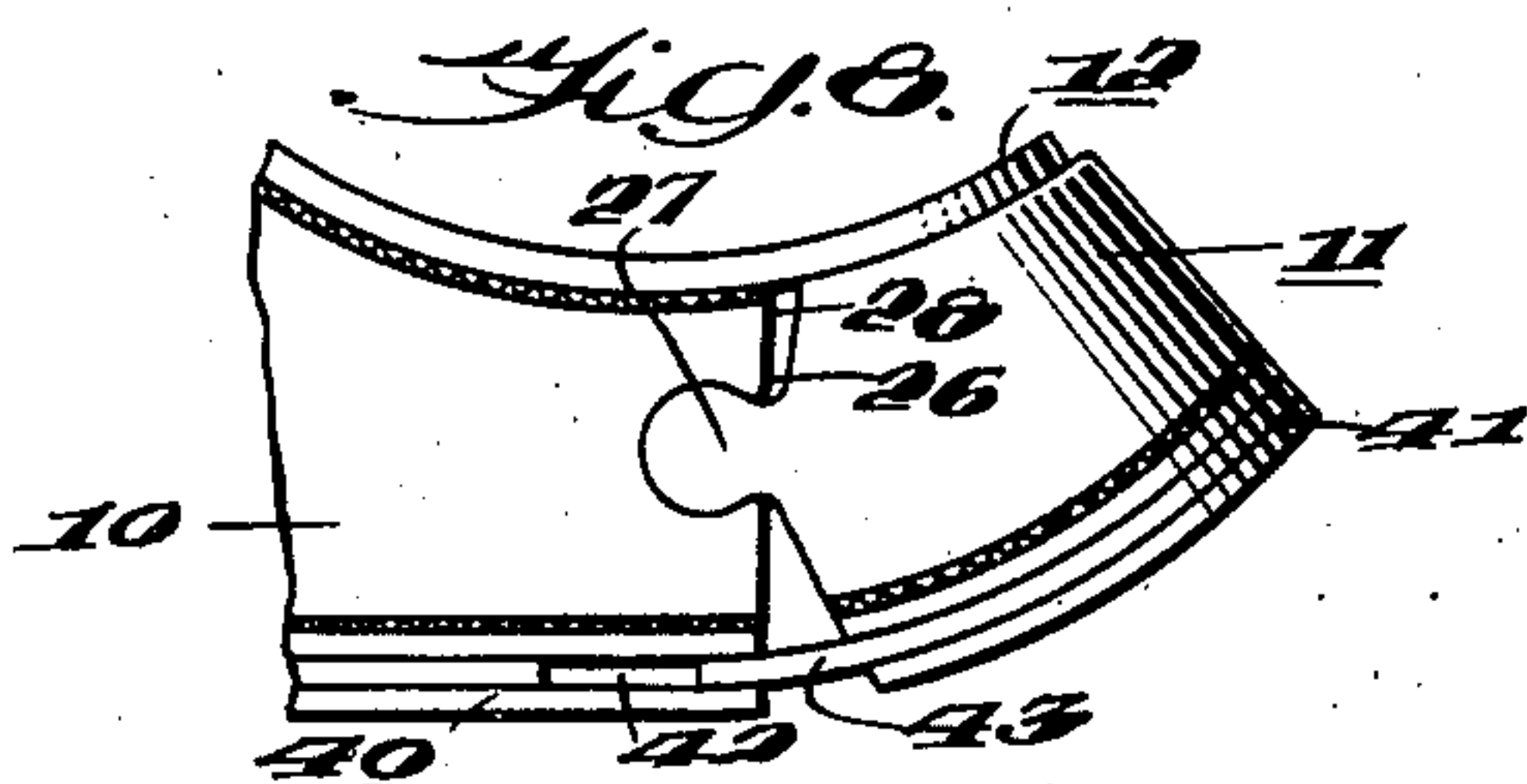


Fig. 8.



Inventors

MADISON D. PICKENS,
EDWIN A. PECKER,

By

Mason & Mason

Attorneys

UNITED STATES PATENT OFFICE

2,343,700

SHOE

Madison D. Pickens and Edwin A. Pecker, Philadelphia, Pa., assignors to Machine & Tool Designing Company, Philadelphia, Pa., a corporation of Pennsylvania

Application April 22, 1943, Serial No. 484,048

3 Claims. (Cl. 36—30)

This invention relates to footwear and, in particular, to the provision of a new and improved shoe or sandal particularly adapted to production from wood "Pregwood" "Compregwood," plastics and other non-strategic materials and which shoe may be cheaply produced in large quantities, whereby to relieve the existing shortage in leather and metallic shoe hardware.

It is a particular object of this invention to provide such a shoe having an articulated sole structure embodying a hinge with a flexible insole adapted to cover the hinge joint between the sole portions or members for protecting the wearer's foot from pinching, this insole also acting as a biasing member tending always to urge the toe portion or toe member of the sole structure toward extended position.

These and other objects and advantages will appear from the following description taken in conjunction with the accompanying drawing.

In the drawing:

Fig. 1 is a top plan view of a shoe constructed according to the principles of this invention;

Fig. 2 is a view, in side elevation, of the shoe illustrated in Fig. 1;

Fig. 3 is a fragmentary transverse section taken substantially on the line 3—3 of Fig. 2;

Fig. 4 is a transverse section taken substantially on the line 4—4 of Fig. 2;

Fig. 5 is a fragmentary view, in side elevation, illustrating the positions assumed by the parts of the sole structure when the wearer's foot is flexed.

Fig. 6 is a fragmentary view, in side elevation, of a modified form of this invention embodying a simplified hinge structure.

Fig. 7 is a view similar to Fig. 6 but illustrating a second modification of the invention wherein the hinge joint is protected against the entry of foreign material from the outside; and

Fig. 8 is a view similar to Fig. 7 but showing the parts in the position assumed when the wearer's foot is flexed.

Referring to the drawing in detail, the sole structure of the shoe illustrated in Figs. 1 to 4 inclusive comprises a blocklike heel piece generally designated 10, a toe piece hingedly connected to the forward end of the heel piece 10 and generally designated 11, and an insole generally designated 12.

The insole 12 is substantially coextensive in length with the shoe proper. This insole 12 is secured to the heel piece substantially throughout the length of the heel piece 10, but is free of attachment with the toe piece 11 over which it extends.

Secured to the heel piece 10 and attached portion of the insole 12 is a skeleton upper comprising an instep strap 14, an ankle strap 15 and a heel strap 16 having its ends suitably secured to the ankle strap 15. These straps 14, 15 and 16 may be made of any suitable flexible textile or other material, preferably at least one of the straps 15 or 16 being elastic. Otherwise a buckle or other known adjustable device (not shown) may be provided for adjustment to the wearer's foot and for convenient ingress and egress.

The heel piece 10 and toe piece 11 may be formed of any suitable material such as wood, "Pregwood," "Compregwood," composition or molded plastic, the insole 12 being formed of any suitable flexible material. The bond 17 between the insole 12 and heel piece 10 is secured by any appropriate adhesive such as hot or cold glue where insole and heel piece are plywood and wood respectively. Throughout the drawing the bonds are exaggerated and made visible although they be invisible in fact.

Optionally, an outsole is provided comprising the heel plate 18 secured by bond 19 to the heel piece 10 and the toe plate 20 secured by bond 21 to the toe piece 11. Where the heel piece 10 and toe piece 11 are formed of such materials as basswood or balsa such outer coverings or wear plates are particularly advantageous.

In order to decrease the weight of the shoe or sandal, suitable lightening holes or apertures 22, 23 and 24 are optionally provided at suitable locations whereby the weight and distribution of weight, or balance, of the shoe may be closely controlled.

The hinge connection between the heel piece 10 and toe piece 11 is achieved by means of complementary hinge members formed integrally with the heel piece 10 and toe piece 11. As shown in Figs. 2 and 5, these hinge members may comprise a transverse socket 25 adjacent the forward end of heel piece 10 and opening through the forward surface thereof in a slot 26, and a cylindrical hinge member 27 rotatably supported in the socket. The hinge member 26 is formed integrally with the toe piece 11 and extends rearwardly from the rear end thereof. Above the hinge member 27, the rear end of the toe piece 11 is cut away at 28 in order to allow flexing of the parts as shown in Fig. 5.

An alternative form of hinge is shown in Fig. 6. This hinge structure comprises aligned slots 30 and 31 in the adjacent ends of the heel piece 10 and toe piece 11 respectively, and a flexible hinge strip 32 secured in said slots in any suitable man-

ner as by pegs or nails 33, and/or a suitable adhesive. This hinge structure like the above described hinge structure 25, 26, 27, 28 permits flexing of the shoe when the foot of the wearer is flexed.

In the embodiments illustrated in Figs. 1-5 inclusive in Fig. 6, and in Figs. 7 and 8, the free forward portion of the insole 12 which overlies the hinge joint and slidingly engages the upper surface of the toe piece 11 protects the foot of the wearer from pinching by reason of protrusion into the space between the movable heel piece 10 and toe piece 11.

Furthermore, the resiliency of this insole causes it constantly to return the parts from the flexed position shown in Fig. 5 to the extended position shown in Figs. 2 and 6.

In the modification illustrated in Figs. 7 and 8, the structure of Figs. 1-5 inclusive is modified by provision of relatively heavy heel and toe plates designated 40 and 41 respectively, one provided with a slot 42 and the other with a complementary tongue 43 supported in said slot. The cooperative relation of this tongue and slot effects protection of the hinge structure from foreign matter seeking to enter in the flexed position of the parts (Fig. 8). This feature is, of course, as readily applicable to the hinge structure illustrated in Fig. 6 as to the hinge structure of Figs. 1-5 inclusive. Likewise, while a single, skeleton, form of upper only is shown, any known design of upper may be applied to the sole structures illustrated and described above.

As shown in Figs. 2, 3, and 4, the upper surface of the heel plate 10 is recessed at 35 (Figs. 2 and 3) to receive the joined ends of the ankle strap 15 and at 34 (Figs. 2 and 4) to receive the joined ends of the instep strap 14. The bond 17 extends through these areas and effectively secures the engaged portions of the straps 14 and 15 between the heel piece 10 and insole 12. In the same manner uppers of any desired type or extent may be secured, marginally at least, between insole and heel piece.

From the above description, it will clearly appear that we have provided shoe constructions adapted to production from non-strategic materials totally without the use of leather or metallic fittings. The heel and toe members of the sole proper may be turned out of wood or fabricated of impregnated wood, known as "Pregwood," impregnated and compressed wood, known as "Compregwood," moulded plastic or other available compositions. Because of the articulation provided by the hinge connection between these parts, which allow the sole to flex with the flexing foot of a wearer, it is unnecessary that the material from which these members are made be either flexible or resilient.

The bridging of the hinge joint by the relatively flexible insole protects the wearer's foot

from pinching and, in addition, constantly biases or urges the toe member or toe portion toward extended or "flat" position and protects the wearer's foot from friction incident to relative movement between the toe portion or member and the wearer's foot.

Likewise the protective outsole illustrated in Figs. 7 and 8, effectively protects the hinge structure and prolongs the life thereof.

It is, of course, to be understood that the above description is merely illustrative and in nowise limiting and that we intend to comprehend within our invention all modifications within the scope of the appended claims.

Having thus fully described our invention, what we claim as new and desire to secure by Letters Patent is:

1. In a sole construction, comprising a heel piece and a toe piece both of rigid material, hinge means for said pieces, and a lower sole comprising a plurality of layers of material, said layers forming a broken joint with parts of each layer connected to the heel piece and other parts connected to the sole piece, the parts of one of said layers attached to one of said pieces having a tongue extending beneath a portion of the other piece, whereby to protect said hinge means from foreign matter.

2. In a sole construction, comprising a heel piece and a toe piece both of rigid material, hinge means for said pieces located between the upper and lower surfaces of said pieces, an upper sole attached permanently to said heel piece and loosely extending at least partially over said sole piece, and a lower sole comprising a plurality of layers of material, said layers forming a broken joint with parts of each layer connected to the heel piece and other parts connected to the sole piece, the parts of one of said layers attached to one of said pieces having a tongue extending beneath a portion of the other piece, whereby to protect said hinge means from foreign matter.

3. In a sole construction, comprising a heel piece and a toe piece both of rigid material, hinge means for said pieces located between the upper and lower surfaces of said pieces, an upper sole attached permanently to said heel piece and loosely extending at least partially over said sole piece, and a lower sole comprising a plurality of layers of material, said layers forming a broken joint with parts of each layer connected to the heel piece and other parts connected to the sole piece, the parts of one of said layers attached to one of said pieces having a tongue extending beneath a portion of the other piece, whereby to protect said hinge means from foreign matter, a part of another layer being located beneath said tongue but attached to the other piece and being in sliding engagement with said tongue.

MADISON D. PICKENS.
EDWIN A. PECKER.