Dec. 16, 1941. A. C. TREECE 2,266,575

SHOE HEEL

Filed Dec. 3, 1938 2 Sheets-Sheet 1

Fig. 1.

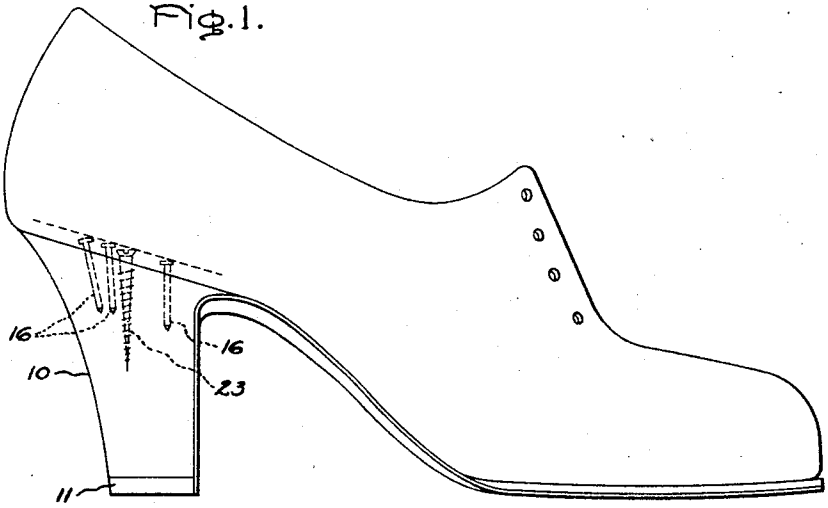


Fig. 2.

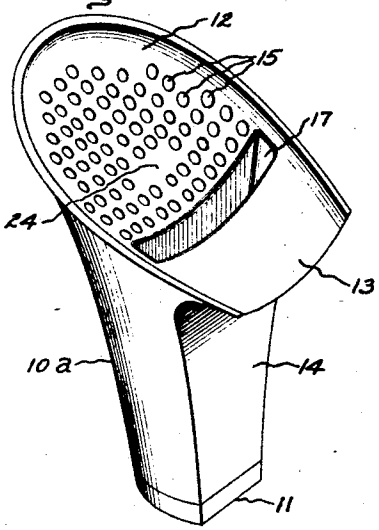
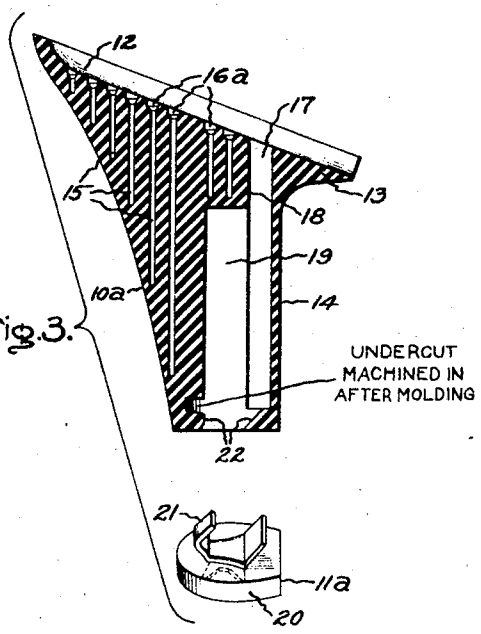


Fig. 3.



Inventor

Arthur C. Treece,

by Harry E. Dunham

Their Attorney.

Dec. 16, 1941. A. C. TREECE 2,266,575

SHOE HEEL

Filed Dec. 3, 1938 2 Sheets-Sheet 2

Fig. 4.

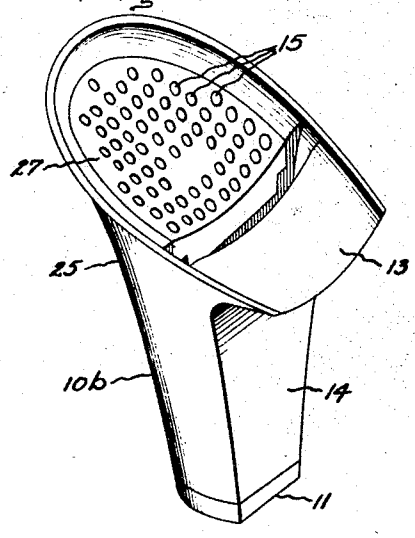


Fig. 5.

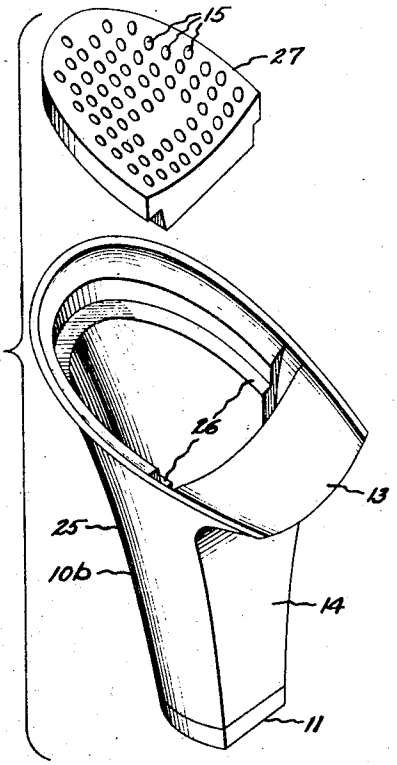


Fig. 6.

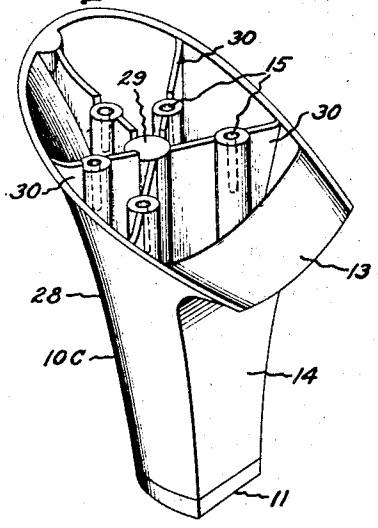


Fig. 8.

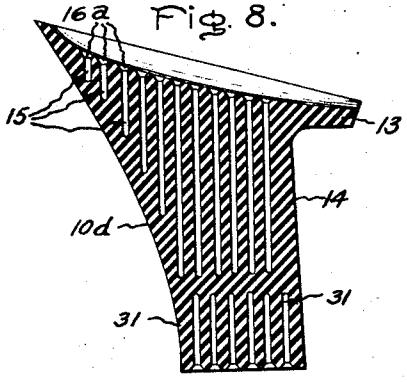


Fig. 7.

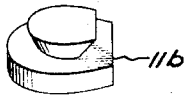
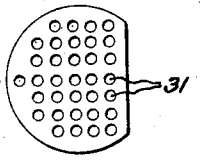


Fig. 9.



Inventor

Arthur C. Treece,

by Harry E. Dunham

Their Attorney.

Patented Dec. 16, 1941 2,266,575

UNITED STATES PATENT OFFICE

2,266,575

SHOE HEEL

Arthur C. Treece, Chicago, Ill., assignor to General Electric Company, a corporation of New York

Application December 3, 1938, Serial No. 243,798

7 Claims. (Cl. 36—34)

The present invention relates to the construction of a shoe heel, and more particularly to the production of molded shoe heels adapted to be fitted in the conventional manner, as by nailing, to any kind of footwear.

For ladies' dress shoes in particular, but also for other types of shoes, wooden heels have been commonly used, these being nailed to the sole and provided with a veneer of cellulose nitrate, thin inferior leather, or similar sheet material, suitably colored and polished in order to give the wooden heel a desired ornamental appearance. The wood tended to split or chip, thereby ruining the heel and to some extent the shoe, as repairs could not readily be made. Further, accidental abrasions of the thin veneer often spoiled the appearance of the shoe before any considerable use had been made of it.

It has been suggested heretofore to use, instead of the usual built-up leather or wooden heels, heels formed of metal or of different plastic molding compositions such, for example, as phenolic resins, hard rubber, cellulosic substances such as cellulose nitrate, cellulose acetate and ethyl cellulose, as well as other materials. Various constructions and fastening means have been proposed to secure heels of this kind to the footwear, but to the best of my knowledge none has met the general requirements of shoe manufacturers either because of impracticability or because of the increased cost involved.

It is an object of the present invention to provide a novel shoe heel.

It is a further object of the invention to provide a strong, molded shoe heel which is light in weight and which can be rigidly fastened easily and quickly to a shoe or other footwear. The preferred embodiment can be fastened to the shoe sole with conventional automatic nailing machines such as used in nailing wooden heels to soles. This is a matter of great practical importance to shoe manufacturers, since it renders unnecessary capital investment in new machinery, and avoids the increased production costs which otherwise might occur in changing from the use of wooden heels in shoe construction to heels molded from plastic synthetic resin masses or other plastic materials.

The novel features which are characteristic of the invention are set forth in the appended claims. The invention itself, however, will best be understood by reference to the following more detailed description when considered in connection with the accompanying drawings in which

Fig. 1 is a side view of a shoe embodying the invention, with heel-attaching means shown in outline;

Fig. 2 is a perspective view of a heel illustrating one embodiment of the invention;

Fig. 3 is a side-sectional view of the heel of Fig. 2, with the heel lift or tap portion thereof shown in perspective and pulled away from the main heel portion;

Fig. 4 is a perspective view of a heel illustrating another embodiment of the invention and which has fitted into the upper portion thereof a heel-pin guide member or inset which is made separately from the main body portion;

Fig. 5 is a view similar to Fig. 4 showing the heel-pin guide member separated from the main body portion;

Fig. 6 is a perspective view of a heel illustrating another embodiment of the invention;

Fig. 7 is a perspective view of another type of heel tap or lift with which the heels of this invention may be fitted; and

Figs. 8 and 9 are side sectional and bottom plan views, respectively, of a heel construction whereby a tap (not shown) of leather or the like can be nailed directly to the main heel portion.

Briefly described, this invention comprises the production of a shoe heel having within the boundaries of its side walls a plurality of spaced apart guides for heel pins, nails, screws, etc., for attaching the heel to the shoe. These guides extend partly but not completely downwardly through the heel. The walls defining these guides are constituted of molded and hardened plastic material which in such state is penetrable by, and capable of gripping firmly, the heel pin or other elongated heel fastener employed. Usually the entire main body of the heel is made of the same plastic material as the guide walls, which may be molded as an integral part of the main heel portion. Suitable means are provided for retaining the guides in their spaced positions and for attaching a heel tap or lift to the bottom of the heel. The scope of the invention also includes shoes provided with the herein described and claimed shoe heels. The term "shoe" as used herein is intended to include within its meaning all kinds of footwear.

Referring to the drawings, it will be noted that the shoe heels shown in the various figures comprise an upper main body part or portion which in Fig. 1 is designated by the numeral 10, in Figs. 2 and 3 as 10*a*, in Figs. 4 and 5 as 10*b*, in Fig. 6 as 10*c* and in Fig. 8 as 10*d*. To the lower end of the main body part is fastened a

heel tap or lift designated by the numeral 11 in Figs. 1, 2, 4, 5 and 6, and as 11a and 11b, respectively, in Figs. 3 and 7.

The main body portion preferably is molded as a unitary structure from a suitable plastic molding composition such, for example, as a mixture of phenolic resin and a suitable filler. The mass is molded into the desired shape under heat and pressure in accordance with methods well known in the art. Instead of phenolic resin other plastic and resinous materials may be used as, for example, hard rubber, acrylate and methacrylate resinous compositions, celluiosic plastics such as those made with cellulose nitrate (pyroxylin), organic esters of cellulose such as cellulose formate, cellulose acetate, cellulose butyrate, cellulose propionate, and cellulose ethers such as methyl cellulose, ethyl cellulose, benzyl cellulose, etc. The molding composition either may be so chosen that the main heel body is transparent, or so that the exterior surface has a high luster, or such a luster may be secured by polishing with a suitable buffing composition.

Especially in the case of ladies' dress shoes the upper wall 12 (Fig. 2) of the main body portion preferably is made in concave form, thereby permitting a better fit and grip of the heel to the shoe. Such shoes also preferably are provided with an extension 13 protruding from the upper front wall 14 and suitably shaped for joining with the instep of the shoe.

As shown in several figures of the drawings, the main body portion has within its side walls a plurality of spaced apart guides or guide wells 15 for receiving or guiding the heel pins 16 (Fig. 1) used in attaching the heel to the shoe. The guides 15 may be arranged, for example, as shown in Figs. 2 and 3, that is being so spaced and in such number as to give the upper wall 12 of the heel a honeycomb appearance. With such construction no difficulty is encountered in driving the heel pins 16 into the heel with conventional automatic nailing machinery. Preferably, although not necessarily, the guides are countersunk as shown at 16a (Figs. 3 and 8). The guides extend partly but not completely downwardly through the heel, thereby permitting the heel pins to penetrate, and to be gripped by, the walls of hardened plastic material defining the guides. In general, the depth of the individual guides is varied in conformity with the contour of the heel.

The diameter and shape of the guides may be varied. In general, these details are determined by the particular heel fasteners employed. Since nails or pins are the common heel fastening means, the guides conveniently are tube shaped and of a diameter such as to favor entry of the heel pin into the guide. It is not necessary that the heel pin completely fill the guide chamber. With automatic shoe nailing machinery, the pins are driven into the heel at a slight angle from the vertical, thereby improving their effective grip. In such a case, the pins will pass at an angle into the walls defining the guides and will only partly occupy the guide chamber. Likewise it is not necessary that the pins enter the heel at the mouth of the guides, because the nature of the plastic material itself is such that it can be penetrated by the heel pin. The guides or guide wells in this case provide a place for movement of material which is displaced by penetration of the heel pin into the plastic material. In this way stresses tending to split the heel are relieved and there is no eruption on the upper surfaces which otherwise would impair the fit of the heel on the shoe.

If desired, suitable recesses may be provided in the main body of the heel to decrease its weight, thereby lessening the amount of plastic material required and correspondingly reducing the production cost. Such a recess is shown, for example, at 17 in Figs. 2 and 3. When a heel tap such as shown at 11a in Fig. 3 is employed, the wall 18 (Fig. 3) advantageously is of such configuration as to provide a depression therein as shown at 19 (Fig. 3). The tap 11a comprises a base 20, which may be made, for example, of leather, rubber or of suitable transparent, translucent or opaque synthetic material. This base is provided on its top with an attaching stud 21, made for instance of metal or of other suitable material. This stud is adapted to pass through the opening defined by the rim 22, and expands over the rim thereby to hold the tap firmly to the heel under all conditions of ordinary wear. Another form of such tap, which may be made if desired entirely of rubber, or of other yieldable material, is shown in Fig. 7. The particular tap constructions shown are not a part of this invention.

In some cases a screw 23, as well as a plurality of nails 16 (for example five) are used in attaching the heel to the shoe, as indicated in Fig. 1 where one screw and three nails are shown by way of illustration. When a screw (or screws) is used, the upper wall 12 is suitably drilled to receive the same after the heel has been placed in position upon the shoe. In this case, the guide wells may be omitted, if desired, as shown for example at 24 (Fig. 2), from the portion of the wall 12 which the screw penetrates.

The heel shown in Figs. 4 and 5 provides the advantages of the honeycomb structures previously described, but with considerable savings in material. This heel comprises a hollow shell 25 of firm structure having in its upper portion an inwardly projecting flange or land 26. A heel-pin guide member or inset 27 is of such size and shape as to be adapted to fit snugly within shell 25 on flange 26. This inset is formed of suitable molded and hardened plastic material, which is capable of being penetrated and gripped by heel-attaching pins, examples of which material previously have been given. The shell 25 may be formed of the same material. Or, if desired, it may be formed of different material, as for example metal of adequate strength. The guides 15 penetrate the inset 27 and preferably are so spaced apart and in such number as to give this member a honeycomb appearance. Preferably these guides extend only part way downwardly through the inset, thus providing a bottom base in each guide for such heel pins as may reach that point.

The inset 27 is held rigidly in position by any suitable means. For example, when the shell 25 and the inset 27 are formed of a material such as cellulose acetate, the surfaces of the inset that are to contact the shell may be dipped in, or sprayed with, a suitable solvent, such for instance as acetone, thereby softening these surfaces. The effect of this acetone softening is to permit the inset and the shell to fuse or weld together in a solid structure.

The lower end of the main body portion 18b (Figs. 4 and 5) may be constructed as shown in Figs. 3 and 8, either construction providing suitable means for attaching the tap or lift 11.

The heel construction shown in Fig. 6 has cer-

tain advantages, as for example less material is required, but is not so satisfactory as the other constructions shown when the heel is to be attached to a shoe with automatic nailing machinery. The heel shown comprises a shell **28** provided with guides **15** held in spaced relation from each other and from the core **29** by the fins **30**. The fins and the walls defining the guides merge into the back and side walls defining the heel. The core **29**, which may be hollow or solid, merges into the back wall of the heel. With this construction, which provides a heel that is strong and light in weight, heel taps or lifts such as shown in Figs. 3 and 7 are employed.

The heel shown in Fig. 8 represents a modification wherein bottom guides or guide wells **31** are provided so that a tap (not shown) of leather or the like can be nailed directly to the main body portion **10***d* of the heel.

The heels of this invention may be formed of a transparent, translucent or opaque molding composition in any desired color, plain or mottled. They can be readily and permanently polished, and are readily re-polished should they become scratched or marred. The constructions shown permit of ready molding of the plastic material. The molded heel can be extracted from the mold without difficulty and without substantial losses as scrap. The heels are relatively inexpensive. They have good service life, as they resist splitting or chipping, and are otherwise highly satisfactory for the intended purpose.

The term "heel pin" or "heel pins" as used in the appended claims is intended to include within its meaning pins, nails, screws and other elongated fastening means, formed of metal or equivalent material, and used in attaching a heel to a shoe.

What I claim as new and desire to secure by Letters Patent of the United States, is:

1. A shoe heel comprising a hollow shell of firm structure having the configuration of a heel and having in its upper portion an inwardly projecting flange, a heel-pin guide member adapted to fit snugly within said shell on said flange and being formed of molded and hardened plastic material which in such state is penetrable by heel pins for attaching the heel to a shoe, said member being rigidly held in position by suitable means and having within the boundaries of its side walls a plurality of heel-pin guides so spaced apart and in such number as to give the said member a honeycomb appearance.

2. A shoe having attached thereto with heel pins a shoe heel comprising a hollow shell of firm structure having the configuration of a heel and having in its upper portion an inwardly projecting flange, a heel-pin guide member adapted to fit snugly within said shell on said flange and being formed of molded plastic material penetrable by the said heel pins, said heel-pin guide member being rigidly held in position by suitabe means and having within the boundaries of its side walls a plurality of heel-pin guides so spaced apart and in such number as to give the said member a honeycomb appearance, and a heel tap or lift suitably fastened to the bottom of the said shell.

3. A shoe heel as in claim 1 wherein the hollow shell is formed of a molded plastic material.

4. A heel member comprising a hollow shell of firm structure, said shell having the configuration of a shoe heel and having in its upper portion an inwardly projecting flange to which is securely fastened a heel-pin guide member of substantial thickness, said guide member fitting snugly within said shell on said flange and having within the boundaries of its side walls a plurality of heel-pin guides so spaced apart and in such number as to give the said member a honeycomb appearance, the walls defining said guides being formed of resistant but yielding material penetrable by heel pins for attaching the heel to a shoe, and means for attaching a heel tap or lift to the said shell.

5. An article comprising a hollow shell of firm structure having the configuration of a shoe heel, an extension protruding from the upper front wall of the said shell and suitably shaped for joining with the instep of a shoe, an inwardly projecting flange in the upper portion of the said shell, a heel-pin guide member adapted to fit snugly within said shell on said flange and being formed of resistant but yielding material penetrable by heel pins for attaching the heel to a shoe, said member being rigidly held in position by suitable means and having within the boundaries of its side walls a plurality of heel-pin guides so spaced apart and in such number as to give the said member a honeycomb appearance, and a heel tap or lift suitably fastened to the bottom of the said shell.

6. An article as in claim 5 wherein the hollow shell is formed of a molded plastic material.

7. A shoe heel comprising a hollow shell of firm structure having the configuration of a heel, a land of substantial thickness in the upper inner portion of said shell and integral therewith, a heel-pin guide member adapted to fit snugly within said shell and having a lower, outer portion thereof resting on the upper surface of said land and bonded thereto, said guide member having a constricted lower portion fitting snugly within the sides of said land and bonded thereto, the whole of said guide member being formed of resistant but yielding material penetrable by heel pins for attaching the heel to a shoe and having within the boundaries of its side walls a plurality of heel-pin guides so spaced apart and in such number as to give the said member a honeycomb appearance.

ARTHUR C. TREECE.