Jan. 23, 1940. K. SCHWELLENBACH 2,187,756

METAL HEEL

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Fig. 1

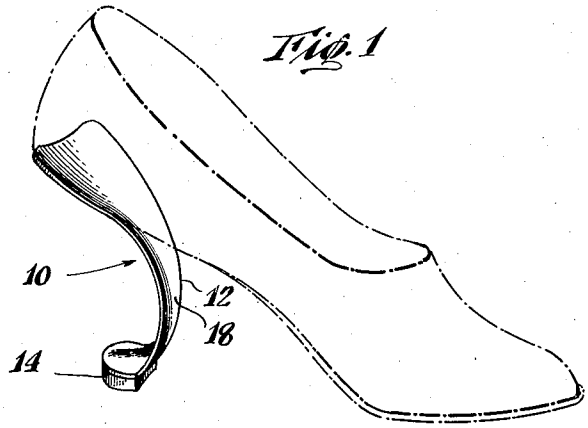


Fig. 2

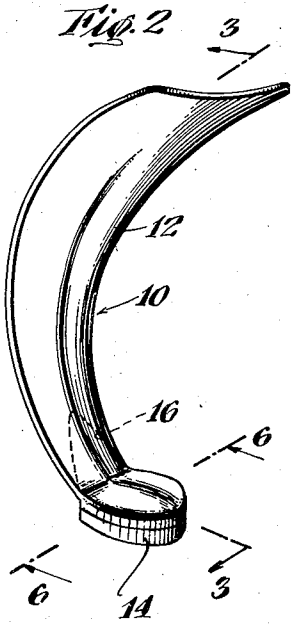


Fig. 3

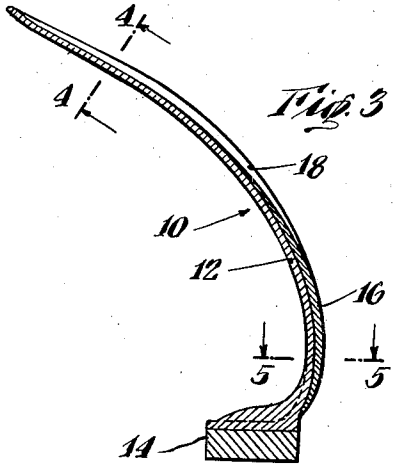


Fig. 4

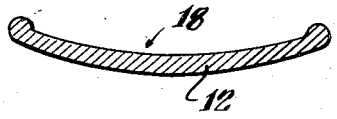


Fig. 5

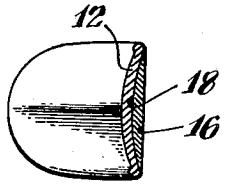
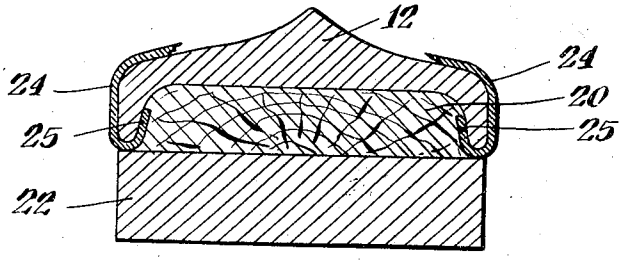


Fig. 6



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METAL HEEL

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Fig. 7

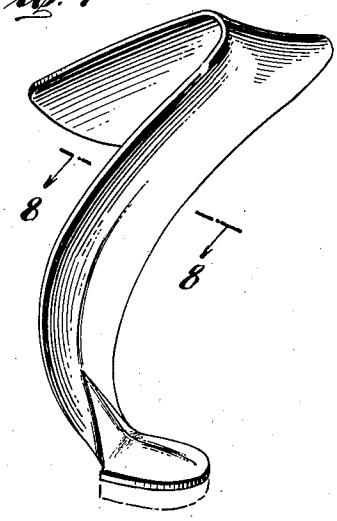


Fig. 8

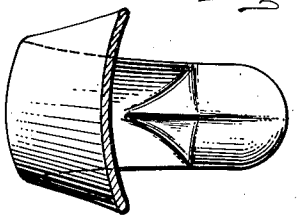


Fig. 9

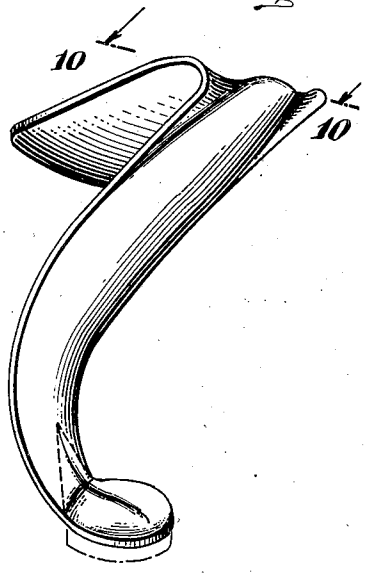


Fig. 10

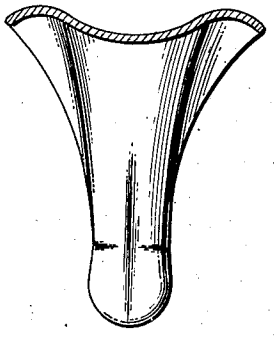


Fig. 11

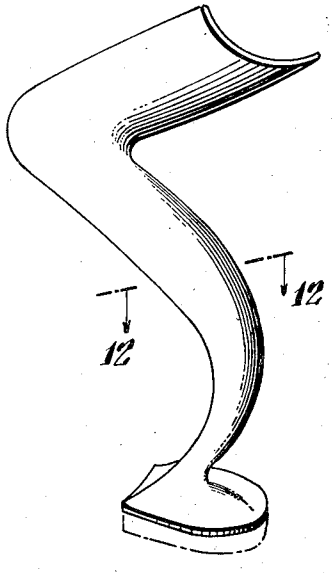


Fig. 12



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UNITED STATES PATENT OFFICE

2,187,756

METAL HEEL

Kathrine Schwellenbach, New York, N. Y.

Application February 10, 1939, Serial No. 255,759

6 Claims. (Cl. 36—34)

This invention relates to the construction of shoe heels of a strip of thin metal and the like.

The New Standard Dictionary defines a heel as "the built-up portion on which the rear of the foot rests". This definition emphasizes the common characteristic that a heel is ordinarily a relatively thick, solid structure built up perpendicularly to the plane of the surface on which the base of the shoe rests. I have discovered that an entirely different type of heel may be constructed by using a strip of comparatively thin metal and bending portions of the strip around longitudinal and transverse axes.

Heels of metal and the like have long been suggested; but such heels have not gone into use although it is recognized that they offer very interesting possibilities in the design and construction of shoes. I believe that the use of metal heels has been definitely retarded by the pronounced spring action found in heels heretofore made.

I have discovered that I can construct metal heels without undesirable spring action. Under a normal walking load the heels of my invention will not "give."

Broadly speaking, my invention consists essentially of a heel made of a strip of thin metal having portions bent around transverse axes and portions bent around longitudinal axes to form a longitudinal channel in the transversely curved portion at points where the metal strip is bent around its transverse axes. The top part of the metal arch is affixed to the shoe and at the base of the arch a lift is affixed to the metal heel.

The degree of bending of the metal strip around transverse axes depends largely upon matters of design. Ordinarily, the design of a metal heel will follow the configuration of some part or all of an S-curve or an inverted S-curve in contradistinction to the straight-breasted, solid heel of the shoe art today.

The essence of my invention resides in bending the metal strip around longitudinal axes as the strip is bent around transverse axes. This construction definitely avoids undesirable spring action.

I find that to obtain the best results the depth of the longitudinal channel formed in the heel should be carefully determined and controlled by adjusting the depth of the longitudinal channel in the light of two factors. First, the depth of the channel should be increased as the bending of the metal strip around transverse axes is accentuated. Second, the depth or pitch of the longitudinal channel should also be increased as the width of the metal strip decreases.

Accentuation of the curve of the metal strip around a transverse axis increases the springiness of the strip. Accordingly, the longitudinal channel in the strip should be given sufficient depth or pitch at such point to eliminate this characteristic. I find that if the longitudinal channel is sufficiently deep it will eliminate this undesirable spring action.

Ordinarily, shoe designs call for narrowing of the heel as it approaches the toplift. Where there is such narrowing the longitudinal channel should at least continue on in the same plane so that the pitch of the channel will increase proportionately as the width of the strip decreases.

In conjunction with the longitudinal channel in the heel I find that sometimes it is advantageous to have a reinforcing fillet member along this narrowing section of the heel to assist in maintaining the rigidity of the metal strip. Accordingly, I provide fillet means at the neck of the heel above the lift. Such means may consist of a separate metal fillet which can be welded or otherwise joined to the metal strip above the lift or the metal strip itself can be thickened at this point to form a reinforcing fillet member.

The heel of my invention is affixed to the shoe member along the top portion of the heel structure. The heel can be affixed by several methods as, for example, by nailing or screwing or stapling, etc., the metal strip onto the base of the shoe member. In some cases, I have found it desirable to provide a definite shelf in the heel to which the shoe member is affixed. In such cases, the shelf itself may be channeled longitudinally.

A very large number of different specific structures can be made under my invention. The metal strip can be bent to conform to a number of different configurations around transverse axes and by the same token the bending of the metal strip around its longitudinal axis to form a longitudinal channel can also be varied. Again, the heel may be formed to have a plurality of longitudinal channels and I have found that a heel structure having two such channels is particularly rigid. The edges of the strip may be rolled or scrolled.

In the drawings I show a few structures incorporating my invention.

Fig. 1 is a perspective view showing a heel of my invention affixed to a shoe member;

Fig. 2 is a rear perspective view of the heel proper;

Fig. 3 is a cross section taken on the lines 3—3 of Fig. 2;

Figs. 4 and 5 are cross sections taken on the lines 4—4 and 5—5, respectively, of Fig. 3;

Fig. 6 is an enlarged cross section of the toplift member along the lines 6—6 of Fig. 2;

Fig. 7 is a perspective view of a heel following an inverted S-curve;

Fig. 8 is a cross section on the lines 8—8 of Fig. 7;

Fig. 9 is a heel having double longitudinal channels formed in the heel and Fig. 10 is a cross section on the lines 10—10 of Fig. 9;

Fig. 11 is a heel showing an S-curve and Fig. 12 is a cross section on the lines 12—12 of Fig. 11.

In Fig. 1 a heel member 10 is shown affixed to the base of a shoe. The heel member 10 consists of a single metal strip 12 and a lift member 14. A fillet reinforcing member 16 is welded or otherwise affixed at the neck of the heel structure to reinforce the curved column of the metal arch 12 as shown in Figs. 2 and 3.

Figs. 1, 2, and 3 show the heel bent around a transverse axis. A channel (indicated at 18 in Figs. 4 and 5) is formed longitudinally in the heel. Figs. 2 and 3 show that the depth or pitch of the longitudinal channel increases as the curve around the transverse axis is accentuated. Fig. 4 shows the depth or pitch of the longitudinal channeling relative to the width of the metal strip at this section. Fig. 5 shows the same channeling (18) as in Fig. 4 but the pitch of the channeling is increased owing to the decrease in the width of the metal strip.

A toplift 22 is affixed to the base of the heel. Fig. 6 shows one way in which the lift can be affixed. Wood or composition material 20 is affixed adhesively to the base of the heel member 12. A toplift 22 is mounted on the wood or composition material 20 by means, for example, of nails driven into the material 20 or the lift 22 can be mounted adhesively to the material 20. If the metal strip 12 is to be covered with cloth or leather or the like, the covering material 24 can be inserted between the composition material 20 and the metal member 12 as shown at 25.

Figs. 7–12 show variations of design and construction of heels of my invention. In each case the longitudinal channeling of the metal strip around a longitudinal axis is deepest at the point where the curve of the metal strip around a transverse axis is greatest.

In Fig. 7 the top of the heel has a shelf-like portion which is channeled longitudinally. This channeling becomes relatively deep at the bend of the inverted S-curve to assist rigidity.

Figs. 9 and 10 show double longitudinal channeling at the top of the heel structure. This double channeling narrows into a single longitudinal channel as shown in Fig. 10. I find that the double channeling is particularly useful in giving a rigid structure where the configuration of the heel structure follows an inverted S-curve.

In Fig. 11 I show a relatively narrow strip which has correspondingly greater depth in the longitudinal channel, as shown in Fig. 12. Fig. 11 also shows a heel structure following the S-curve and having a channeled shelf portion.

This application is a continuation in part of my design applications Serial Numbers D–81,941 and D–81,940, filed December 22, 1938.

I claim:

1. A metal heel for a shoe, comprising a strip of metal, said strip having portions bent around transverse axes and portions bent around longitudinal axes, a longitudinal channel formed thereby in the transversely curved strip, and a lift affixed at the base of said strip.

2. A metal heel for a shoe, comprising a strip of metal, said strip having portions bent around transverse axes and portions bent around longitudinal axes, a longitudinal channel formed thereby in the transversely curved portion at points where the metal strip is bent around transverse axes, and a lift affixed to the base of said strip.

3. A metal heel for a shoe, comprising a strip of thin metal, said strip having portions bent around transverse axes and adjacent portions bent around different longitudinal axes to form two longitudinal channels in the transversely curved portion at points where the transversely curved strip is bent around its transverse axes and a lift affixed to the base of said strip.

4. A metal heel for a shoe, comprising a tapered strip of metal having portions bent around transverse axes and portions bent around longitudinal axes, a longitudinal channel formed thereby in said transversely curved portion, the pitch of said longitudinal channel increasing as the width of said strip decreases, and a lift affixed at the base of said strip.

5. A metal heel for a shoe, comprising a strip of thin metal, said strip having portions bent around transverse axes and portions bent around longitudinal axes, a longitudinal channel formed thereby in said transversely curved portion, a fillet mounted at the base of said strip, and a lift affixed to the base of said strip.

6. A metal heel for a shoe, comprising a strip of metal, said strip having portions channeled around transverse axes and portions channeled around longitudinal axes, a longitudinal channel formed thereby in the transversely curved strip, a shelf-like portion channeled longitudinally at the top of said strip for attachment of the heel to the shoe, and a lift affixed at the base of said strip.

KATHRINE SCHWELLENBACH.