Oct. 1, 1940. E. JAHNCKE 2,216,113

SHOE AND SHOE HEEL

Filed Dec. 8, 1938

Fig. 1.

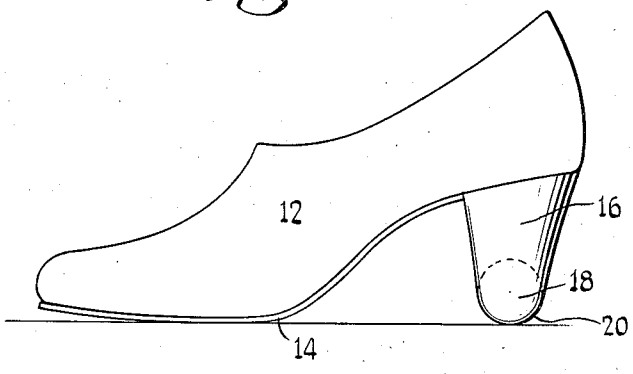


Fig. 2.

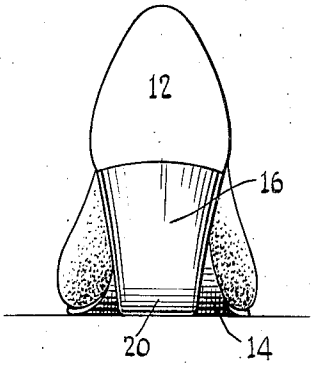


Fig. 4.

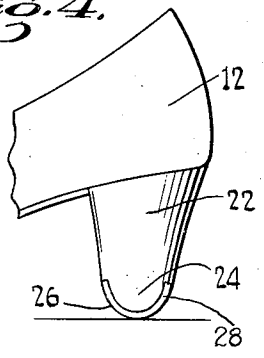


Fig. 5.

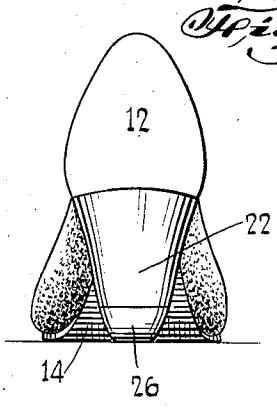


Fig. 6.

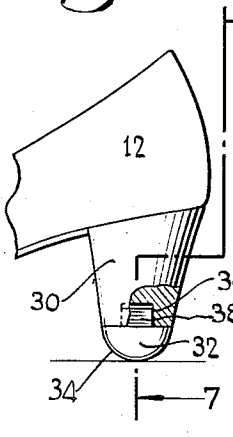


Fig. 7.

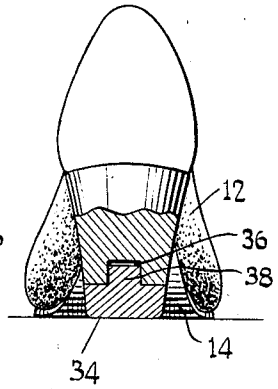
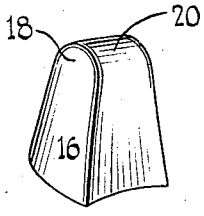


Fig. 3.



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SHOE AND SHOE HEEL

Evelyn Jahncke, New York, N. Y.

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17 Claims. (Cl. 36—34)

This invention relates to improvements in shoes, and particularly to new and useful improvements in the form and construction of shoe heels.

An object of my invention is to provide a new type of shoe having a heel which facilitates walking and gives a continuous and uniform heel support for the foot in the changing positions assumed by the shoe when completing a step.

Another object of my invention is to provide shoes with heels which give an even rolling motion and diminish jarring in walking.

A further object is to provide shoes with heels which provide more uniform and more effective support against turning of the foot than occurs when wearing shoes having heels of the conventional types.

I have discovered that the above mentioned objects and advantages, together with others which will be apparent from the present disclosure, may be realized by constructing shoe heels with round treads which give continuously advancing lines of support for the foot when completing a step, and which also provide firm and substantially uniform support against side-wise turning of the foot and shoe. The natural rolling motion of the foot, which takes place after the heel has first been placed in contact with the ground, is facilitated by forming the heel tread so that it is round, or continuously arcuate, in longitudinal direction, and lateral support against turning of the foot is obtained by making the upwardly curved tread surface substantially straight in transverse direction. With this form of heel, the shoe is free to roll smoothly about the heel tread in a motion conforming closely to the natural motion of the foot in walking. In addition, the novel form of the heel gives improved support for the shoe on rough or irregular walking surfaces.

The accompanying drawing, forming a part hereof, illustrates several suitable embodiments of my invention. In the drawing:

Figure 1 is a side view of a shoe provided with a new form of heel.

Figure 2 is a rear view of the same shoe.

Figure 3 is a perspective view of the shoe heel.

Figures 4 and 5, respectively, are side and rear views of another embodiment of the invention, and

Figures 6 and 7, respectively, are side and rear views of a third embodiment of the invention, with parts of the heel shown in section in each figure in order to reveal details of construction.

As shown in Figures 1, 2 and 3, the shoe comprises an upper **12** and a sole **14** of any suitable construction or design, together with a heel **16** which is formed to embody the principles of my invention. The heel terminates in an end **18** which provides a heel tread **20**. As seen in Figure 1, the tread is continuously round in the longitudinal direction of the shoe, while Figure 2 shows that the tread is straight and substantially parallel to the sole **14** in transverse direction. The form of the entire heel may be more easily perceived by reference to the perspective view in Figure 3. In this particular embodiment the heel tread is substantially circular in longitudinal direction, so that the end of the heel may be said to approximate a cylindrical segment having its axis transverse to the shoe, within the body of the heel, and normally above an intermediate portion of the segment surface. The angular extent of this segment exceeds a radian and even a right angle. Expressed in other terms, the heel end may be said to be substantially in the shape of a hemi-cylindrical segment, or of a segment constituting a major fraction of a hemi-cylinder.

It will be apparent that the heel tread may be formed with various degrees of curvature without sacrificing the principles of my invention, and also that a relatively wide or a relatively narrow transverse line of contact and support may be provided.

In Figures 4 and 5, I show a second embodiment in which the heel **22** has a round end **24**, that is arcuate, but not truly circular, in longitudinal direction. Here, as appears from Figure 5, the sides of the heel taper more sharply than in Figure 2, and a narrower transverse line of contact is provided between the heel tread **26** and shoe supporting surface. It will of course be obvious that the end **24** of the heel still conforms in other general characteristics to the heel end described in connection with earlier figures, e. g., it is in the shape of a cylindrical segment of angular extent exceeding a radian or right angle, with axis disposed as already described.

Figures 4 and 5 also illustrate a suitable manner of constructing the heel with a special tread, which may be, for example, a flexible material such as rubber or wear-resistant material, such as metal. The special tread **26** is provided by a strip or layer **28** which is secured to the heel end **24** by means of fasteners, adhesive, or other suitable means.

Figures 6 and 7 show a third embodiment of the invention in which a shoe having a high heel of conventional form is converted into a shoe embodying the features of my invention. Here, the end portion of a conventional heel **30** has been

removed and the heel has been converted to the new form by attaching thereto an end **32** providing a tread surface **34** that is round in longitudinal direction and straight in transverse direction, as appears from Figures 6 and 7, respectively. A suitable method of securing the heel end **32** to the heel **30** is to provide a counter-bore **36** in the heel **30** and a cooperating projection **38** on the heel end, and then to hold the heel end to the heel, with the projection **38** fitted into the bore **36**, by adhesive, fasteners, or other suitable means.

It will be seen that in the structure of Figures 1–2–3 and Figures 6–7 the heel tread surface curves rearwardly and upwardly, from the line of normal or resting contact with the floor, with a substantially constant or very slightly increasing width, while in the structure of Figures 4–5 it curves rearwardly and upwardly with a substantially increasing width. These characteristics of width, or of transverse spacing between the sides of the heel, apply through the range of the rearward and upward curvature, which is an angularly substantial one—for example in the preferred and illustrated embodiments, of a major part of a radian or right angle. Accordingly in these structures as the sole is rocked upwardly from the floor, or the heel inclined rearwardly from vertical, the heel contact with the floor shifts through a series of regions wherein the widths, or inter-side spacings, are either substantially constant or may even progressively increase.

It will also be seen that in the particularly illustrated structures the surface of the partial cylindrical segment merges smoothly with the rear and front faces of the heel; expressed in other terms, the segment surface extends to have inclinations similar to those of the rear and front heel faces in its respective regions of juncture therewith.

It will be understood that the heels constructed in accordance with my invention may be made of any suitable material such as leather, rubber, rubber-like compositions, wood, etc., and that various special materials providing flexible or wear-resisting qualities may be used on the heel treads, as desired.

Aside from the features and advantages of the new form of heel as mentioned hereinabove, it lends itself readily to embodiment in numerous forms and designs of ornamental character.

I claim:

1. In a shoe, a heel having an end portion substantially in the shape of a single curved segment constituting at least a major fraction of a hemi-cylinder, the axis of said segment being horizontally transverse to the longitudinal direction of the shoe.

2. A heel lift substantially in the shape of a single partial-cylindrical segment whose angular extent is at least a radian and whose axis is horizontal.

3. A heel lift substantially in the shape of a single curved segment constituting at least a major fraction of a hemi-cylinder whose axis is horizontal.

4. In a shoe, a heel having an end portion substantially in the shape of a single curved segment constituting at least a major fraction of a hemi-cylinder, the axis of said segment being horizontally transverse to the longitudinal direction of the shoe and lying within the outer boundaries of the heel.

5. A shoe comprising a heel having an end substantially in the shape of a segment constituting a major fraction of a hemi-cylinder, the axis of said segment being transverse to the longitudinal direction of the shoe, and the surface of said segment merging smoothly into the rear face of the body of the heel.

6. A shoe comprising a heel having an end substantially in the shape of a segment constituting a major fraction of a hemi-cylinder, the axis of said segment being transverse to the longitudinal direction of the shoe, and the surface of said segment merging smoothly into the front and rear faces of the body of the heel.

7. In a shoe having a forward sole, a heel having a curved tread surface adapted to contact the floor in a first surface region when the sole also contacts the floor, said tread surface curving rearwardly and upwardly from said region for contact with the floor in a longitudinally progressive series of regions as the sole is rocked from the floor through a major portion of a radian and having in each of said regions a width at least substantially as great as in said first-mentioned region.

8. A shoe heel having a longitudinally curved tread surface adapted to contact the floor in a first surface region when the heel is vertical, said tread surface curving rearwardly and upwardly from said region for contact with the floor in a longitudinally progressive series of regions as the heel is rearwardly inclined through a major portion of a right angle and having in each of said regions a width at least substantially as great as in said first-mentioned region.

9. A shoe heel whose side elevation is substantially in the form of an inverted triangle having a rounded apex between and smoothly merging with the downwardly extending sides of the triangle.

10. In a shoe, a heel having an end portion substantially in the shape of a single partial-cylindrical segment whose axis is horizontally transverse to the longitudinal direction of the shoe and is within the outer boundaries of the heel and normally lies above an intermediate portion of the surface of the segment.

11. In a shoe, a heel having an end portion substantially in the shape of a partial cylindrical segment whose axis is horizontally transverse to the longitudinal direction of the shoe and normally lies above an intermediate part of the surface of said segment, said surface extending rearwardly to have an inclination substantially similar to that of the rear face of the heel in the region of its juncture therewith.

12. The combination according to claim 11, wherein the surface of said segment also extends forwardly to have an inclination substantially similar to that of the front face of the heel in its region of juncture therewith.

13. In a shoe having a forward sole, a heel having spaced-apart sides and an intervening surface adapted to contact the floor in a first surface region when the sole also contacts the floor, said surface curving rearwardly and upwardly from said region for contact with the floor in a longitudinally progressive series of regions as the sole is rocked from the floor through a major portion of a radian, and the transverse spacing between said sides measured across each of said regions being at least substantially as great as that measured across said first region.

14. In a shoe, a heel having spaced-apart sides and an intervening surface adapted to contact the floor in a first surface region when the heel is vertical, said surface curving rearwardly and

upwardly from said region for contact with the floor in a longitudinally progressive series of regions as the sole is rocked from the floor through a major portion of a right angle, and the transverse spacing between said sides measured across each of said regions being at least substantially as great as that measured across said first region.

15. In a shoe, a heel having an end portion substantially in the shape of a single partial-cylindrical segment whose angular extent is at least a radian, the axis of said segment being horizontally transverse to the longitudinal direction of the shoe.

16. In a shoe, a heel having an end portion substantially in the shape of a single partial-cylindrical segment whose angular extent is at least a radian, the axis of said segment being horizontally transverse to the longitudinal direction of the shoe, and the ends of said segment being substantially planar and substantially parallel.

17. In a shoe, a heel having an end portion substantially in the shape of a single partial-cylindrical segment whose axis is horizontally transverse to the longitudinal direction of the shoe and is within the outer boundaries of the heel and normally lies above an intermediate portion of the surface of the segment, the ends of said segment being substantially planar and substantially parallel.

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