

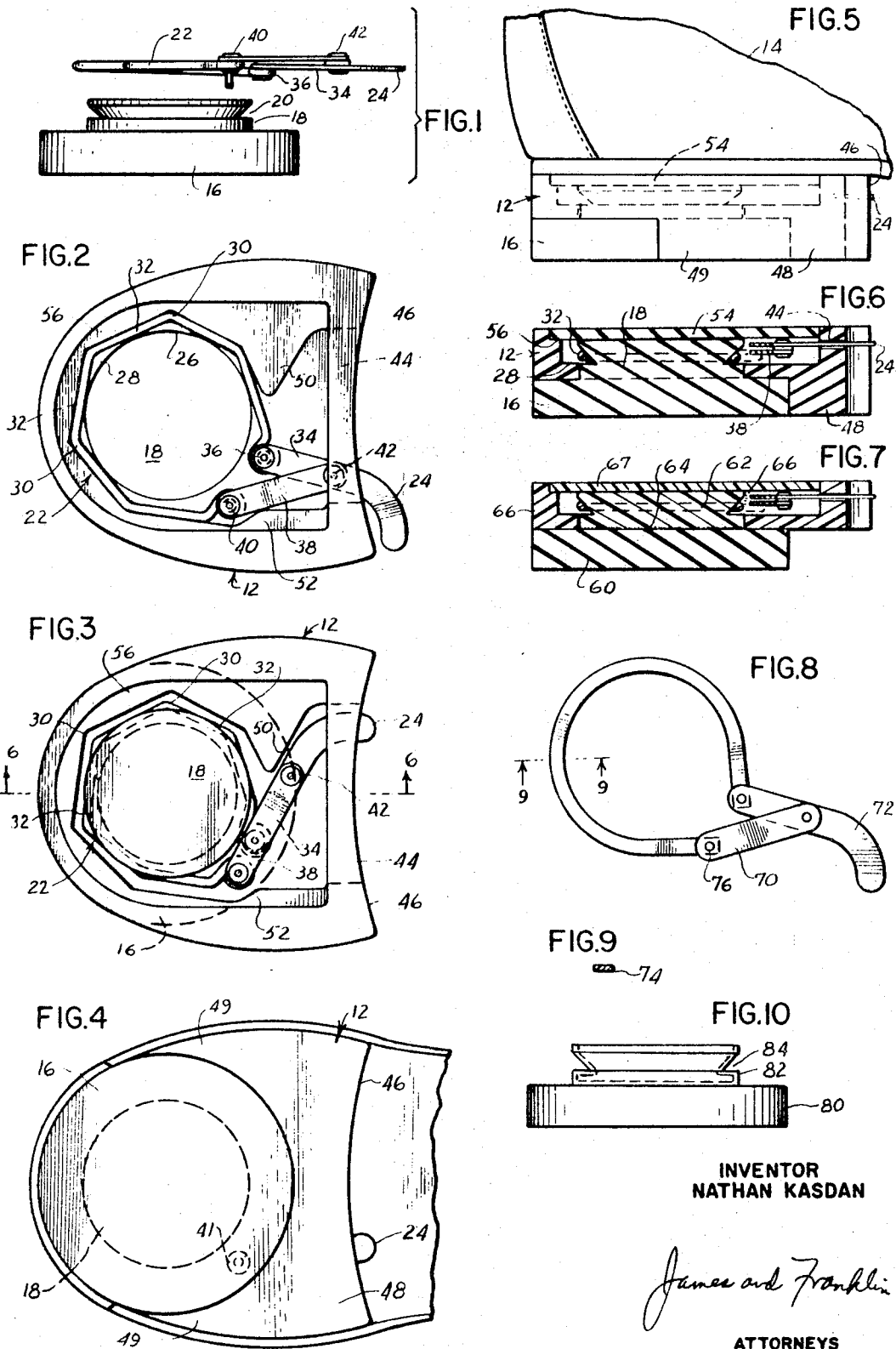
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N. KASDAN

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RENEWABLE HEEL FOR FOOTWEAR

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INVENTOR
NATHAN KASDAN

James and Franklin
ATTORNEYS

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RENEWABLE HEEL FOR FOOTWEAR

Nathan Kasdan, 5 W. 86th St., New York, N.Y. 10024

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ABSTRACT OF THE DISCLOSURE

The present renewable heel comprises a housing and a circular heel plug with a short circumferentially grooved shank projecting upwardly into the housing. A resilient metal noose in the housing receives the shank, and a manually operable lever contracts the noose tightly into the groove in order to lock the plug in heel position, or expands the noose to release the plug for rotation, or even replacement. The noose is preferably polygonal in configuration, with the corners overlying a ledge, and the sides clamping the shank. When the noose is contracted it serves also to draw the shank and plug upwardly. The noose is preferably operated by toggle linkage which is self-locking, and no tools are required.

Background of the invention

Rubber heels wear at the rear corner, and then the entire heel must be replaced by a shoemaker at considerable expense. It has already been suggested to use a circular rubber plug at the rear of the heel so that it can be turned when worn in order to restore full thickness at the rear corner. However, such heels have not proved commercially acceptable for a number of reasons, including the fact that they require the aid of a shoemaker, or at least the use of tools.

Summary of the invention

The present heel comprises a housing adapted to be secured to the rear bottom of a shoe. There is a circular heel plug made of rubber or other frictional material, and this has a short circumferentially grooved circular shank projecting upwardly. The shank is received in the housing while the circular plug is exposed at the bottom rear of the housing to receive the normal heel wear. A resilient metal noose is anchored in the housing and receives the shank. A manually operable lever projects from the housing and is operable to contract the noose tightly into the groove in order to lock the plug in heel position, or to expand the noose to release the plug for rotation or even replacement. The shank is smaller in diameter than the plug, and is received in a mating circular aperture in the housing, and the latter has a ledge around the aperture for receiving the noose and supporting it against downward movement. The noose is preferably polygonal in configuration, with the corners overlying the ledge, and the sides entering the groove for clamping the shank. The upper side of the groove is preferably an inverted frustum of a cone so that when the noose is contracted to clamp the shank, it serves also to draw the shank and plug upwardly. The noose is preferably operated by toggle linkage which is self-locking, and no tools are required.

The foregoing and additional features are described in the following detailed specification, which is accompanied by drawings in which:

FIG. 1 shows a heel plug and an anchoring noose for the same, separated from each other and from the housing;

FIG. 2 is a plan view of the housing, with a cover plate removed to show the noose and toggle mechanism in expanded condition;

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FIG. 3 is a similar view, with the shank clamped by a contracted noose;

FIG. 4 is a bottom plan view of the heel assembly;

FIG. 5 is a fragmentary elevation showing the heel assembly on a shoe;

FIG. 6 is a section through the heel assembly taken approximately on the line 6—6 of FIG. 3;

FIG. 7 is a similar section showing a modified construction;

FIG. 8 is a plan view showing a different form of noose; FIG. 9 is a section through the noose, taken on the line 9—9 of FIG. 8; and

FIG. 10 shows a further modified form of heel plug. Referring to the drawing, and more particularly to FIGS. 2—6, the heel assembly comprises a housing 12 which is generally heel shaped in configuration, and which is secured in heel position to the rear bottom of a shoe, partially shown at 14 in FIG. 5. There is also a circular heel plug 16 made of a frictional material which is preferably, though not necessarily, rubber. A short circular shank 18 projects upwardly from the plug and has a circumferential groove 20 (FIG. 1). This shank is received in the housing 12, while the plug 16 is exposed at the bottom rear of the housing in order to receive the normal heel wear.

A resilient metal noose 22 is anchored in the housing and receives the shank 18. A manually operable lever 24 projects from the housing and is operable between the position shown in FIG. 3 for contracting the noose tightly into the groove 20 in order to lock the plug 16 in heel position, and the position shown in FIG. 2, in which the noose is expanded to release the plug so that it may be turned to renew the rear corner of the heel when worn. After being turned a desired amount, say 90° each time to renew the rear corner, and after being used say four times in this way, the plug with its shank may be removed and replaced by a new plug and shank, although by that time in many cases the shoes may be worn out elsewhere and may be discarded.

The circular aperture 26 (FIG. 2) in the bottom of the housing which receives the shank 18 of the plug is preferably surrounded by a ledge 28 which supports the noose against downward movement, and thereby holds the shank and plug against downward movement. In preferred form the noose 22 is polygonal in configuration, in which case the corners 30 safely overlie the ledge 28, even when the noose has been contracted as shown in FIG. 3. The sides 32 of the noose enter the groove of the shank for clamping the same. The noose is made of spring wire and accommodates the deformation caused by operation of the lever 24.

In preferred form the upper side of the groove 20 is an inverted frustum of a cone, as is most clearly shown in FIG. 1, and the parts are so relatively dimensioned that when the noose is contracted it not only clamps the shank, but draws it upwardly, thereby holding the top of plug 16 tightly against the bottom of the housing 12.

In the form here illustrated the lever 24 operates a simple form of toggle linkage which has the advantage of being self-locking when the noose is contracted. More specifically, there is a first link 34 (FIG. 2) which is connected at 36 to an eye formed at one end of noose 22. A second link 38 is connected at one end 40 to an eye formed at the other end of the noose 22, and is connected at its other end 42 to the first link 34. The latter is extended to provide the aforesaid manually operable lever 24. By comparison of FIGS. 2 and 3 it will be seen in FIG. 3 that the links 38 and 34 averlie at or slightly beyond dead center when the lever 24 is moved sideward from the release position shown in FIG. 2 to the clamped position shown in FIG. 3. The free end of the lever 24 projects from the housing, and preferably and most in-

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conspicuously projects through a horizontal slit 44 in the front or breast wall 46 of the housing.

Referring to FIG. 5, the forward part 48 of the housing is preferably thickened downward an amount approximating the thickness of the plug 16, say $\frac{3}{8}$ inch, and this thickness is carried part way around the sides of the plug, as shown at 49 in FIG. 4, thereby enclosing the forward portion of the plug, and yet exposing the rear portion of the plug as shown in FIG. 5 for normal heel wear.

For easy operation of the toggle mechanism it is desirable to prevent rotation of the noose and its associated toggle mechanism. These parts are held against excess movement by upwardly thickened or molded abutments indicated at 50 and 52 in FIGS. 2 and 3. In addition, the upright wall around the ledge 28 is preferably given a polygonal shape matching that of the noose. This additional means to hold the noose against rotation is another advantage of using a noose of polygonal instead of circular shape. As a further means to prevent rotation of the noose the pivot at 40 preferably extends downward through the housing. The latter may be reinforced by a metal eyelet which receives the pivot. This eyelet is indicated at 41 in FIG. 4. (In FIG. 8 also the pivot 76 preferably extends downward to anchor the noose at one point.)

The top of the housing is preferably closed or completed by means of a cover 54, best shown in FIG. 6. The housing is molded with an additional ledge 56 (FIGS. 2, 3 and 6) to support the cover 54. This ledge becomes large in area at the abutments 50 and 52 previously referred to. If desired, the cover 54 may be cemented in position to permanently confine the noose and its mechanism in the housing.

The resulting assembly may be secured to the shoe in any desired manner, as by the use of cement, or by the use of nails driven through the peripheral portion of the heel, or both. When nails are used they are limited to the sides and rear of the housing where they will not interfere with operation of the toggle mechanism and noose and shank.

As so far described, the plug 16 is assumed to be integral with its shank 18, but this is not necessarily the case, and referring to FIG. 7, the plug 60 is made of one material, typically rubber, and has secured thereto a shank 62 made of another material, for example a molded plastic material. These may be secured together, as by means of adhesive indicated at 64. Metal fasteners also may be used. Plugs like the plug 60 may be die cut out of thick sheet rubber.

Another change illustrated in FIG. 7 is the omission of the forward or breast portion of the housing 66 (that is, the parts 48 and 49 in FIGS. 4-6). In FIG. 7 the entire bottom of the housing 66 is at the level of the top of the plug 60, and the bottom part of the heel assembly is circular, it comprising only the plug 60. Such a heel assembly is somewhat less attractive in appearance than that shown in FIGS. 5 and 6, but retains the main advantage that the plug may be turned when worn, and may be removed and replaced when more completely worn.

A modified form of noose may be described with reference to FIGS. 8 and 9 of the drawing. In this case, the toggle mechanism 70 and 72 is the same as previously described, but the noose 74 is formed out of flat resilient metal, as will be seen by the section through the material shown in FIG. 9. The width of the material is sufficient for the noose to overlie the ledge (28 in FIG. 2) when the noose has been contracted, thereby anchoring it, and the shank clamped thereby, against downward movement. If the noose is die cut out of sheet metal it may be made polygonal on the outside, while being smoothly curved on the inside edge.

It is not essential for the shank portion of the plug to be solid. If molded, it may be hollowed to conserve in the use of material. It may even be made of sheet metal which is first drawn to cup shape, and then spun inwardly

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to provide a circumferential groove. Such a construction is illustrated in FIG. 10 in which the solid heel plug 80 is circular, and may be cut from an appropriately thick, say $\frac{3}{8}$ inch thick sheet of a frictional resilient material, typically and preferably rubber. The shank 82 is a sheet metal cup which is secured to the plug 80, as by means of cement or metal fasteners or both. The side wall of the cup is inwardly grooved as shown at 84. The plug 80 with its shank 82 are received and clamped in a housing which may be like that shown in FIGS. 2-6, or that shown in FIG. 7.

The noose is preferably made of a non-ferrous metal such as Phosphor bronze, or it may be a stainless steel, to avoid rust. Similar remark applies to the toggle linkage. The housing and its cover may be made of rubber, or may be molded in final form out of a moldable plastics material. The cover may be die cut out of sheet material, and it is not essential to use such a cover at all. In FIG. 7 the shank 62 and the housing 66 are assumed to be molded out of a suitable molded plastics material. The cover 67 is die cut out of a plastics material in sheet form. In FIG. 6 the parts are assumed to be made of rubber.

It is believed that the construction and method of use of my improved renewable heel assembly, as well as the advantages thereof, will be apparent from the foregoing detailed description. It will also be apparent that while I have shown and described the invention in several preferred forms, changes may be made without departing from the scope of the invention, as sought to be defined in the following claims.

I claim:

1. A heel comprising a housing adapted to be secured to the rear bottom of a shoe, a circular heel plug made of a frictional material, a short circular shank projecting upwardly from said plug and having a circumferential groove, said shank being received in said housing with the circular heel plug exposed at the bottom rear of the housing to receive the normal heel wear, a resilient metal noose anchored in said housing and receiving said shank, a manually operable lever connected to said noose and projecting from said housing for either contracting the noose tightly into said groove in order to lock the plug in heel position, or to expand said noose to release said plug for rotation or replacement.

2. A heel as defined in claim 1, in which the shank is smaller in diameter than the plug, and in which the housing has an aperture dimensioned to receive the shank, and has a ledge around said aperture for receiving said noose and for supporting the same against downward movement.

3. A heel as defined in claim 2, in which the upper side of the groove is an inverted frustum of a cone, whereby the noose when contracted to clamp the shank serves also to draw the shank and plug upwardly.

4. A heel as defined in claim 3, in which the noose is operated by toggle linkage comprising a first link connected to one end of the noose, a second link connected at one end to the other end of the noose and connected at its other end to the first link, said first link being extended to provide the aforesaid manually operable lever, the links being so dimensioned and arranged that they overlie at or beyond dead center when the lever is operated to contract the noose, the front end of the housing being horizontally slotted and the free end of said lever projecting through said slot for movement to one side or the other for expanding or contracting the noose.

5. A heel as defined in claim 4, in which the forward part of the housing is thickened downward to approximately the thickness of the plug in order to enclose the forward portion of the plug, the rear portion of the plug being exposed for normal heel wear.

6. A heel as defined in claim 1, in which the shank is smaller in diameter than the plug, and in which the housing has an aperture dimensioned to receive the shank and has a ledge around said aperture for receiving said noose and for supporting the same against downward move-

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ment, and in which the noose is polygonal in configuration, the corners of said polygon overlying said ledge and the sides of said polygon entering the groove for clamping the shank.

7. A heel as defined in claim 6, in which the upper side of the groove is an inverted frustum of a cone, whereby the noose when contracted to clamp the shank serves also to draw the shank and plug upwardly.

8. A heel as defined in claim 1, in which the upper side of the groove is an inverted frustum of a cone, whereby the noose when contracted to clamp the shank serves also to draw the shank and plug upwardly.

9. A heel as defined in claim 1, in which the noose is operated by toggle linkage comprising a first link connected to one end of the noose, a second link connected at one end to the other end of the noose and connected at its other end to the first link, said first link being extended to provide the aforesaid manually operable lever, the links being so dimensioned and arranged that they overlie at or beyond dead center when the lever is operated to contract the noose.

10. A heel as defined in claim 1, in which the noose is operated by toggle linkage comprising a first link connected to one end of the noose, a second link connected at one end to the other end of the noose and connected at its other end to the first link, said first link being extended to provide the aforesaid manually operable lever, the links

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being so dimensioned and arranged that they overlie at or beyond dead center when the lever is operated to contract the noose, the front end of the housing being horizontally slit and the free end of said lever projecting through said slit for movement to one side or the other for expanding or contracting the noose.

11. A heel as defined in claim 1, in which the forward part of the housing is thickened downward to approximately the thickness of the plug in order to enclose the forward portion of the plug, the rear portion of the plug being exposed for normal heel wear.

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ALFRED R. GUEST, Primary Examiner

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