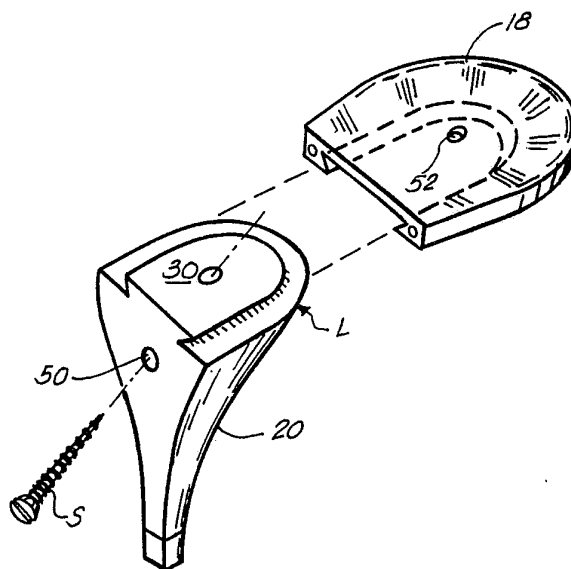




INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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<p>(21) International Application Number: PCT/US91/07760 (22) International Filing Date: 21 October 1991 (21.10.91) (71)(72) Applicants and Inventors: KOEHL, Timothy [US/US]; 4817 Taft Park, Metairie, LA 70002 (US). MACKENROTH, Joseph [US/US]; 8117 MacArthur Drive, Harahan, LA 70123 (US). (74) Agent: NEHRBASS, Seth, M.; Pravel, Gambrell, Hewitt, Kimball & Krieger, 1177 West Loop South, Tenth Floor, Houston, TX 77027-9095 (US). (81) Designated States: AT, AU, BB, BG, BR, CA, CH, CS, DE, DK, ES, FI, GB, HU, JP, KP, KR, LK, LU, MC, MG, MN, MW, NL, NO, PL, RO, SD, SE, SU, US, European patent (AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LU, NL, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, SN, TD, TG).</p>		<p>Published <i>With international search report.</i></p>

(54) Title: SHOE CONSTRUCTION WITH SELF SEATING REMOVABLE HEEL



(57) Abstract

A high heel shoe (10) with a self seating removable heel portion (20) includes a shoe body having a sole portion (13) with a toe area (14) and a heel area (16), the heel area (16) being elevated substantially above the toe area (14) so that the shoe sole (13) is inclined between the toe and the heel and at the heel area. The heel portion (18) of the shoe sole (13) has a socket (25) with a forwardly facing open end (26) and a closed rear end (28), the socket (25) having a sidewall forming a continuous dove-tail joint portion. The high heel (20) has an enlarged upper end portion with an inclined upper surface and a dove-tail locking member extends upwardly from the high heel upper end portion inclined surface, the locking member including a pedestal (30) with a dove-tail sidewall (32) that corresponds to and registers with the socket (25) so that the heel (20) can be attached to the socket (25) by moving the heel pedestal (30) into the socket into a fore to aft direction, and wherein the heel (20) is constantly loaded rearwardly during use insuring a seating of the heel (20) upon the socket (25) during use.

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-1-

APPLICATION FOR PATENT**SHOE CONSTRUCTION WITH SELF
SEATING REMOVABLE HEEL**

5

SPECIFICATIONBACKGROUND OF THE INVENTION:1. Field of the Invention

The present invention relates to shoe constructions and more particularly relates to a high heel shoe construction having a removable heel that affixes to the body portion of the shoe with a self loading dove-tail joint construction that is hidden upon assembly entirely within the confines of the heel so that a continuous smooth outer line defines the interface between the heel and the shoe.

2. General Background

High heel shoes are typically made of a high grade plastic or leather material with a synthetic or leather sole and having a heel which can be plastic which is strong but somewhat brittle. While this heel material works well on shoes, the outer coating of the heel is typically a designer material such as a leather veneer. During use, this outer heel covering can become cut or scuffed such as for example when the user steps into a metal grate, or between the wooden board portions of a deck, or is simply scratched against concrete curbs, lightpost or other obstruction along sidewalks.

Once the exterior of the heel is damaged, the entire shoe is rendered useless. It would thus be desirable to have a removable heel that could be replaced by the owner of the shoe. The removability and replacement should be easy to accomplish. The replacement should not be visibly apparent from the exterior of the shoe rendering its design unpleasing to the eye. Further, the removable heel construction should necessarily be a relatively inexpensive construction so that the consumer can replace the heel easily with minimum time and labor. Further, the removable

-2-

heel should be of such a simple construction that a professional shoe repair facility is not required.

The removability of the heel would preferably give the user the ability to change the look of a shoe by installing
5 a heel of a different color or size or shape.

Several United States patents have been issued relating to shoes with interchangeable or exchangeable heel constructions. However for the most part, these patents disclose complicated constructions that require metallic
10 interfaces between the heel and the shoe, and/or the use of complicated fasteners or connectors that would render their construction too expensive and/or cumbersome to operate. Further, some require the use of extra tools so that they are an unworkable solution for the average user. Still
15 other removable heel constructions suffer because the joint between the heel and the shoe is so readily apparent to the user that they destroy the design of the shoe rendering them unfit for intended use.

U.S. Patent No. 4,805,320 issued to Goldberg et al.,
20 entitled "Shoe With Exchangeable Heel" discloses an article of footwear comprising a shoe having a removable and replaceable heel. Attached to the sole surface of the shoe's upper is an outwardly projecting shaft which is adapted to fit into an internal bore formed in the core of
25 the shoe heel member. A latch mechanism is provided for inhibiting unintended separation of the heel from the upper.

U.S. Patent No. 4,670,996 issued to Dill entitled
30 "Women's Shoes With Flexible Spring Steel Shanks For Use With Replaceable Heels Of Different Height" shows a women's shoe with flexible shank for use with replaceable heels of different height includes a sole with a forward support portion and a raised heel portion and an overlying insole. An elongated flexible spring steel shank is nested within
35 a slot between the insole and sole and at one end anchored thereto. A high heel registers with the heel portion and interlocking fasteners upon the heel and heel portion upon

limited rotation of the heel relative to the shoe removably anchors the heel upon the shoe. The heel upon limited angular rotation and disengagement of the fasteners is adapted for removal and replacement by a low heel having
5 similar fasteners. The shank moves within the slot to compensate for the change in height. The interlocking fasteners include opposed interconnected lock segments and anchor flanges secured respectively to the heel and heel portion. An alignment pin in the heel projects into an
10 alignment opening in the sole preventing relative rotation of the heel and heel portion to prevent disengagement of the segments and flanges.

U.S. Patent No. 4,610,100 issued to Rhodes entitled "Shoe With Replaceable Heel" shows a shoe with a removable
15 heel that is attached to the shoe by means of a dove-tail connection. A high heel shoe construction is shown. The Rhodes shoe has a permanently affixed heel plate attached to the bottom of a heel support portion of the shoe. This heel plate contains a mortise having a decreasing
20 transverse width from the front to the rear of the heel plate. A replaceable heel having a flat surface on one side and a dove-tail on the reverse surface corresponds in shape to the opening in the mortise which is slid into the mortise to be firmly seated by a friction fit on the heel
25 plate. The rear of the heel has an outcropping of the dove-tail which is visible from the rear of the shoe.

U.S. Patent No. 4,443,956 issued to Caccavale entitled "Shoe Replaceable Heel Kit" discloses a replaceable heel device including a heel base including a replaceable heel
30 mounted on the bottom of the heel portion of the sole of a shoe, a replaceable heel connecting means for removably screwing said replaceable heel to the underside of the heel base and fastening means for securing the heel base to the sole. The connecting means includes a circular base plate
35 secured to the underside of the heel base and a circular replaceable plate secured to the top of said replaceable heel. The base plate has a male threaded perimeter and the

replaceable plate has a female screw threads adapted to mate with the threaded perimeter of the base plate. The connecting means for women's replaceable high heel is to secure base plate directly to heel portion of shoe sole and apply fastening means described. Included in women's replaceable high heel is a replaceable lift device, including a lift base plate fastened at the heel tip, having a female screw insert mounted therein and a male screw removably screwed into said female screw insert, said male screw being provided with replaceable lift for said female lift base plate.

U.S. Patent No. 4,198,770 issued to Orea Mateo entitled "Device For Fixing Heels" shows a heel which is longitudinally traversed by a threaded stem provided with a head which can be activated from the lower zone of the heel and whose free end is screwed into a blind hole made centrally in a projection of the lower face of a flat cover which is adjusted in a recess made in the upper zone of the heel. The flat cover is solidly fastened to a plate arranged on the upper face of the inner sole by fixing elements which pass through the inner sole and its inner shank.

U.S. Patent No. 3,581,413 issued to Harvey Simonetti shows a detachable heel for shoes such as ladies' or men's shoes that includes a means for permitting the manual locking or unlocking of the heel with respect to the shoes, so that heels can be placed or changed whenever desired or requires.

U.S. Patent No. 2,943,404 issued to R. Sultan entitled "Replaceable Heel Construction", discloses a removable heel that attaches to the shoe with a metallic connector member.

U.S. Patent No. 2,795,867 issued to M. Zuckerman et al., entitled "Shoes", shows a metal dove-tail like construction for attaching a removable heel to a shoe wherein the connection is made by pushing the heel forwardly and locking it onto the shoe.

-5-

U.S. Patent No. 2,795,866 issued to A. Perugia entitled "Ladies' Shoes" shows a removable heel construction having a metal runway rivoted to the bottom of a shoe that carries the removable heel.

5 U.S. Patent No. 2,449,914 issued to H. Simonetti entitled "Detachable Heel", shows a metallic plate-like member that carries the removable heel in a detachable fashion.

10 U.S. Patent No. 2,439,310 issued to F.M. Mancuso entitled "Detachable Heel", provides a dove-tail-like connection mounted from the rear to the forward portion of the shoe and a spring loaded detent locking member for securing the heel in position.

15 U.S. Patent No. 2,431,868 issued to T. Gilmour entitled "Detachable Shoe Heel", provides a heel which loads onto the shoe body from the rear to the front wherein a tee-shaped cross-sectional beam is mounted on the shoe sole and a corresponding socket is formed on the heel with a locking member in the form of a transverse bar holding
20 the heel onto the shoe.

SUMMARY OF THE PRESENT INVENTION:

The present invention provides a simple yet effective connection for a high heel shoe with a removable heel portion in that the high heel is loaded during use for self
25 seating of the heel onto the shoe, eliminating the need for complicated locking mechanisms to ensure that the heel is firmly affixed to the shoe. Further, the present invention provides an asthetically pleasing connection in that a single unbroken line defines the interface between the
30 removable heel and the sole of the shoe body.

The present invention provides a high heel shoe construction with a self-seating removable heel portion. The shoe body includes a lower shoe sole with a toe and a heel area, the heel area being elevated substantially above
35 the toe area so that the shoe sole is inclined between the toe and the heel, and also at the heel area. The shoe portion of a shoe sole has a socket with a forwardly facing

-6-

open end portion and a closed rear end portion, the socket having a side wall forming a continuous dove-tail joint portion. A high heel is removably attached to the shoe and has an enlarged upper end portion with an inclined upper surface carrying a dove-tail locking member that extends upwardly from the high heel upper end portion inclined surface. The locking member includes a pedestal with a dove-tail side wall that corresponds to and registers with the socket so that the heel can be attached to the socket by moving the heel pedestal into the socket in a fore to aft direction. The pedestal and socket are thus loaded during normal use of the shoe, so that during walking, the heel pedestal continuously forced rearwardly into the socket, eliminating the need for transverse locking pins, springs or the like. Because the socket is closed at its rear end, the connection of the heel to the shoe body defines an unbroken line defining a plane generally parallel to the upper surface of the high heel. Thus, there are no visible outcroppings of dove-tail joints, pins, locking members or the like which are visible. The shoe connecting parts are hidden so that the shoe appears no different from the exterior than a typical prior art high heel shoe construction.

In the preferred embodiment, the apparatus provides a socket that is generally U-shaped.

In the preferred embodiment, both the socket and the pedestal are generally U-shaped and correspond to one another.

In the preferred embodiment, a layer of shock absorbing resilient material is placed as an interface between the heel and the shoe sole.

In the preferred embodiment, the pedestal is removably affixed to the high heel forming a load carrying member that can be replaced independently of the high heel itself.

In the preferred embodiment, the high heel upper surface has a socket receptive of the pedestal.

BRIEF DESCRIPTION OF THE DRAWINGS:

For a further understanding of the nature and objects of the present invention, reference should be had to the following detailed description, taken in conjunction with the accompanying drawings, in which like parts are given like reference numerals, and wherein:

FIGURE 1 is a side view of the preferred embodiment of the apparatus of the present invention;

FIGURE 2 is a side view of the high portion of the preferred embodiment of the apparatus of the present invention;

FIGURE 3 is a fragmentary view of the preferred embodiment of the apparatus of the present invention;

FIGURE 4 is a fragmentary perspective view of the preferred embodiment of the apparatus of the present invention;

FIGURE 5 is a fragmentary side view of the preferred embodiment of the apparatus of the present invention;

FIGURE 6 is a perspective fragmentary view of the apparatus of the present invention; and

FIGURE 7 is a fragmentary sectional view of a second embodiment of the apparatus of the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT:

FIGURES 1 - 6 show generally the preferred embodiment of the apparatus of the present invention designated generally by the numeral 10.

In FIGURES 1 - 6, there can be seen a shoe body having a sole 13, a toe area 14 and a heel area 16. The shoe sole 13 includes a forward flat portion 15 at the toe area, and an inclined 17 portion of the sole 13 that extends from the toe area 14 rearwardly to a heel 18 portion of sole 13.

A removable high heel 20 includes a lower end portion 22 which is of a smaller diameter, defining a narrowed lower section of the heel terminating at tip 21, and an upper enlarged portion 23. The heel portion 16 of the shoe includes the heel sole 18 section which has an inclined

-8-

orientation when the shoe 10 fits on a flat surface F (FIGURE 1).

The heel 18 portion of the sole 13 carries socket 25 which is open at its forwardly facing end portion 26 and, which is closed at its rear end portion 28. The socket 25 is generally U-shaped having a U-shaped side wall which is inclined or beveled as shown in FIGURE 3 to define a dove-tail connection that is receptive of connecting pedestal 30 portion of heel 20. Pedestal 20 provides a corresponding inclined or beveled side wall 32 which conforms in size and configuration to the socket 25 configuration as seen in FIGURES 3 and 4 so that the pedestal 30 registers into the socket 25 forming a tight fitting connection therewith. The rear end portion 28 of the socket 25 is preferably curved so that the socket is U-shaped. The rear end portion 34 of the pedestal 30 is similarly curved to register with the curved 28 portion of socket 25.

Upon assembly of the pedestal 30 into the socket 25, a rigid connection is formed between the heel 20 and the sole 18, and the U-shaped 34 portion of the pedestal 30 nests and registers with the U-shaped portion 28 of the socket 25. Because the heel 18 portion of the sole 13 and the upper surface of the pedestal 30 are inclined (FIGURE 1), the heel 20 is constantly being forced rearwardly during use. As the wearer walks, a rearward load component continuously loads the pedestal 30 into the socket 25. Thus, with the present invention there is minimal chance that the removable heel 20 can be inadvertently dislocated from its operating position within the socket 25. Upon assembly of the heel 20 into the sole 18 at socket 25, a cover plate 40 can be mounted across the pedestal 30 with mounting holes 41, 42 correspondingly registering upon the mounting holes 43, 44 of the sole portion 18. Thereafter, small fasteners such as screws S can be used to completely prevent removal of heel 20 from sole portion 18.

-9-

In the embodiment of FIGURE 6, a single inclined screw S can be attached through diagonal bore 50. Screw S penetrates through heel 20 and pedestal 30 via bore 50 and then upwardly into the opening 52 of sole 13 portion if
5 desired to complete a threaded connection between heel 20 and sole 13. Optionally, bore 50 is pre-threaded to allow screw S to easily penetrate through heel 20 and sole portion 13.

The dovetail connection in combination with the angle
10 at which screw S connects heel 20 and heel portion 18 of sole 13 is a safety feature to help prevent heel 20 from coming off unexpectedly. Because of the angle at which screw S goes through heel 20 and heel portion 18, there are half threads in heel 20 and heel portion 18. Even if screw
15 S is not fully inserted in heel portion 18, as long as screw S is in contact with both sets of half threads, then heel 20 will not come out of socket 25.

In the embodiment of FIGURE 7, the heel 20 provides a socket 60 receptive of pedestal 30A in a removable fashion.
20 The pedestal 30A includes a central vertical bore 62 receptive of a threaded fastener for example such as Bolt B. Beneath the pedestal 30 can be placed a resilient layer of shock absorbing material 64 such as rubber, foam or the like for cushioning the interface between pedestal 30A and
25 heel 20. Similarly, a layer of shock absorbing material 65 can be placed about the periphery of pedestal 30A adjacent inclined dove-tail peripheral portion 32A.

The present invention provides a simple straightforward yet workable solution to the problem of
30 connecting a heel 20 to a shoe 12 in a removable fashion and without any visible connecting parts so that the shoe 10 appears no different from a common high heel shoe. One of the features of the present invention is that there are no exposed or visible dove-tail joint portions which would
35 render the design unpleasing to the eye. The pedestal 30 and the socket 25 are entirely contained within the confines of the outer surface of the heel 20 so that upon

-10-

assembly only a smooth unbroken line L is visible, similar to the line which exists on common commercially available high heel shoes between the sole and the heel. The transverse surface 37 which extends about pedestal 30 can be sized to be slightly spaced from the transversed surface 38 that surrounds socket 25. The spacing can be for example one millimeter or the like so that leather or other covering material layered upon the heel 20 could be wrapped about the corner 39 and onto the surface 37 without interfering with the connection between pedestal 30 and socket 25.

Because many varying and different embodiments may be made within the scope of the inventive concept herein taught, and because many modifications may be made in the embodiments herein detailed in accordance with the descriptive requirement of the law, it is to be understood that the details herein are to be interpreted as illustrative and not in a limiting sense.

What is claimed as invention is:

CLAIMS:

1. A high heel shoe with self seating removable heel portion comprising:

5 a) a shoe body having a sole with a toe and a heel area, the heel area being elevated substantially above the toe area so that the shoe sole is inclined between the toe and heel and at the heel area;

10 b) the heel portion of the shoe sole having a socket with a forwardly facing open end and a closed rear end, the socket having a beveled side wall forming a dove-tail joint portion;

c) a removable high heel having an enlarged upper end portion with an inclined upper surface;

15 d) a locking member extending upwardly from the high heel upper end portion inclined surface, the locking member including a pedestal with a beveled, dove-tail side wall that corresponds to and registers with the socket so that the heel can be attached to the socket by moving the heel pedestal into the socket in a fore to aft direction;

20 e) the pedestal and socket being correspondingly sized and hidden within the heel upon assembly and loaded during walking to continuously force the pedestal into the socket; and

25 f) the connection of the heel to the shoe body forming an unbroken exterior line defining a plane generally parallel to the upper surface of the high heel.

2. The apparatus of Claim 1 wherein the socket is generally U-shaped.

30 3. The apparatus of Claim 1 wherein the socket and the pedestal are generally U-shaped.

4. The apparatus of Claim 1 further comprising a layer of shock absorbing material defining an interface between the heel and the shoe sole.

35 5. The apparatus of Claim 1 wherein the pedestal is removably affixed to the high heel.

6. The apparatus of Claim 5 wherein the high heel upper surface has a socket receptive of the pedestal.

-12-

7. The apparatus of Claim 4 wherein the layer of shock absorbing material is peripherally disposed about the pedestal.

5 8. The apparatus of Claim 5 wherein there are two layers of shock absorbing material including a first layer that is disposed beneath the pedestal and a second layer that is disposed peripherally about the pedestal.

10 9. The apparatus of Claim 1 further comprising fastener means for securing the high heel to the shoe sole after assembly of the pedestal into the socket.

10. The apparatus of Claim 1 wherein the socket is contained entirely within the confines of the heel portion of the shoe body.

15 11. The apparatus of Claim 1 wherein the socket and heel pedestal are contained entirely within the confines of the shoe sole heel portion and the high heel portion upper surface.

20 12. The apparatus of Claim 1 further comprising a shock absorbing interface means positioned between the high heel upper surface and the shoe sole for transmitting load between the high heel and shoe sole portions.

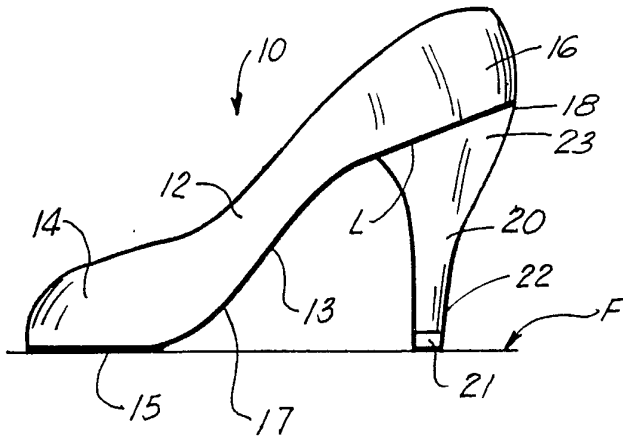


FIG. 1

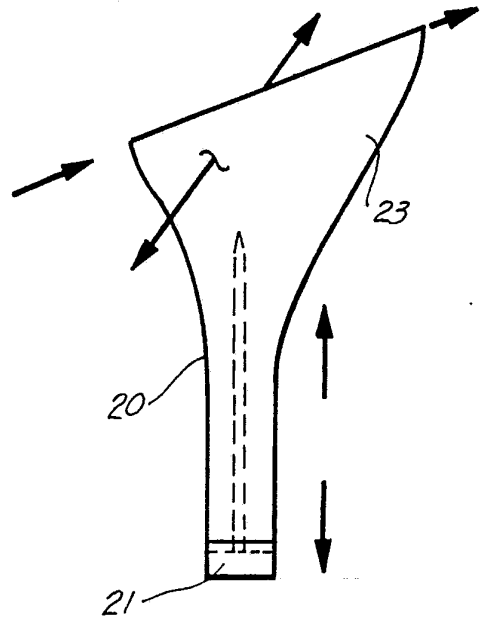


FIG. 2

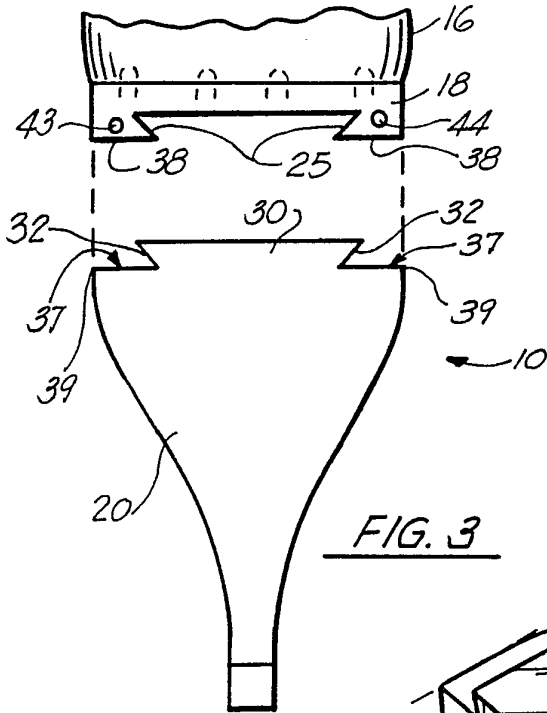


FIG. 3

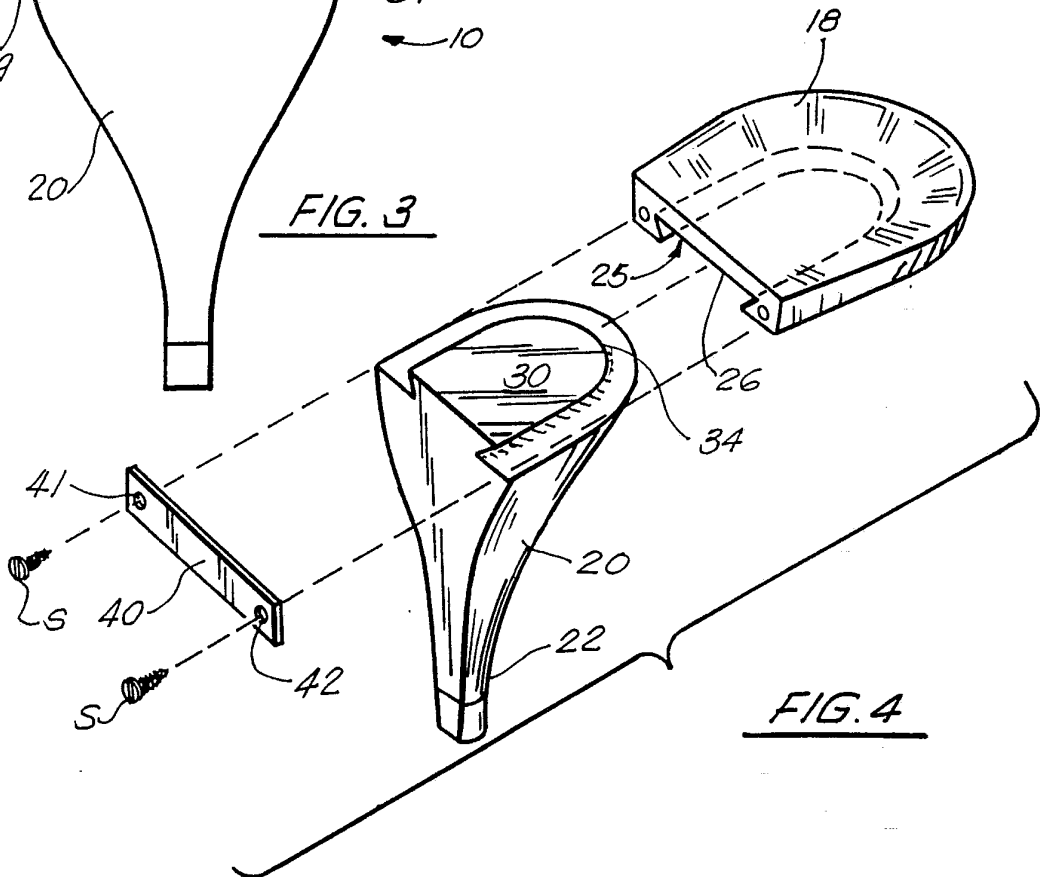
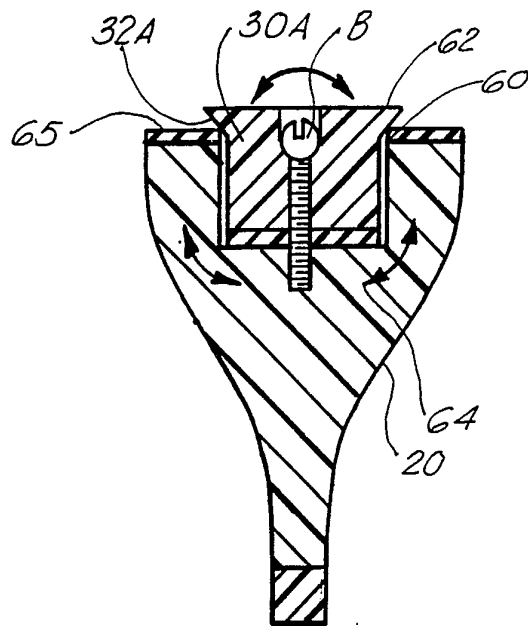
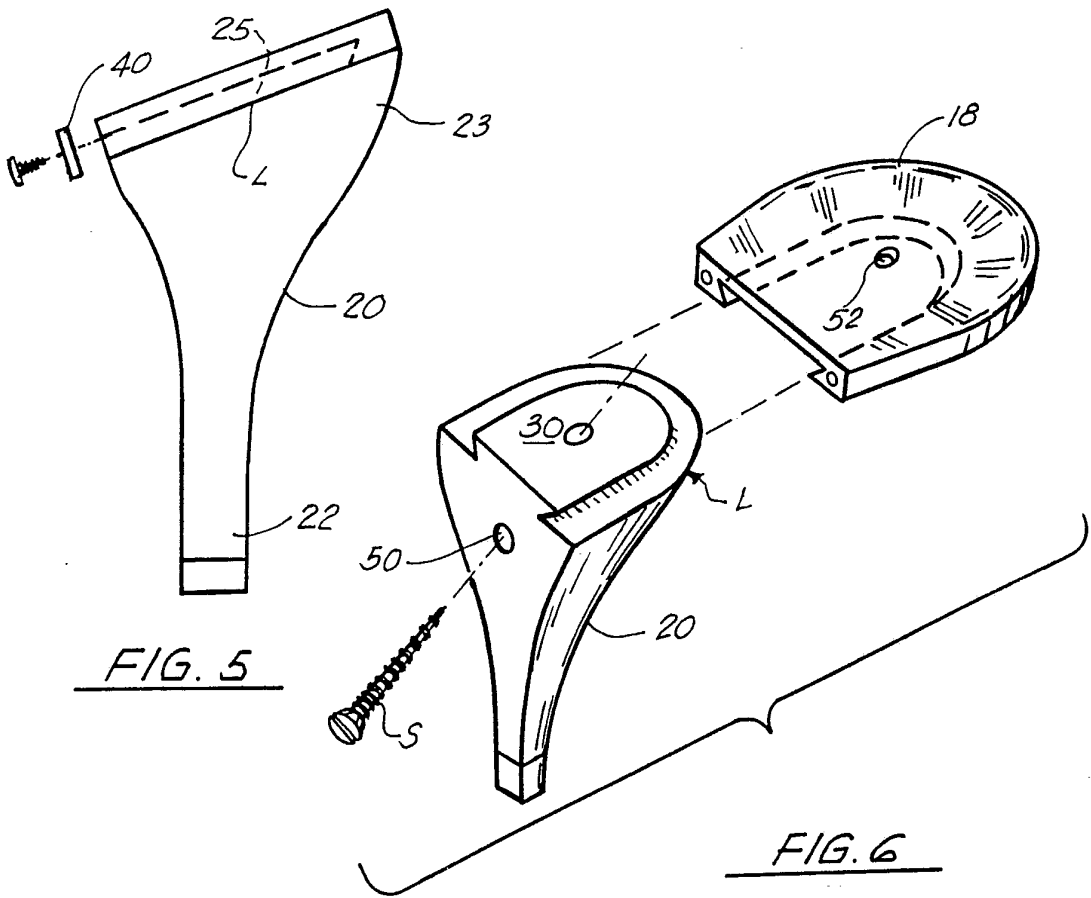
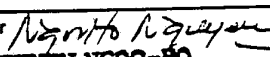


FIG. 4



INTERNATIONAL SEARCH REPORT

International Application No. PCT/US91/07760

I. CLASSIFICATION OF SUBJECT MATTER (if several classification symbols apply, indicate all) ⁶		
According to International Patent Classification (IPC) or to both National Classification and IPC		
INT CL 5 A43B 21/36		
US CL 36/42, 36R		
II. FIELDS SEARCHED		
Minimum Documentation Searched ⁷		
Classification System	Classification Symbols	
US	35/36R, 41, 36A, 36B, 36C, 42, 35R, 40	
Documentation Searched other than Minimum Documentation to the Extent that such Documents are Included in the Fields Searched ⁸		
III. DOCUMENTS CONSIDERED TO BE RELEVANT ⁹		
Category [*]	Citation of Document, ¹¹ with indication, where appropriate, of the relevant passages ¹²	Relevant to Claim No. ¹³
Y	US, A, 1,631,710 Tranides 7 June 1927, see entire document	1-3,9-11
Y	US, A, 4,443,956 Caccavale 24 April 1984, see entire document	1-7,9-11
Y	US, A, 380,508 Minger 3 April 1886 see entire document	4,7,12
Y	US, A, 2,439,310 Mancuso, 6 April 1948 see entire document	5-6
A	US, A 4,848,008 Kuehnle et al 18 July 1989	
A	US, A, 4,610,100 Rhodes 9 September 1986	
A	US, A 4,214,384 Gonzales R. 29 July 1980	
A	US, A, 2,805,302 Sharpe 17 September 1957	
A	US, A, 1,790,332 Tager 27 January 1931	
<p>[*] Special categories of cited documents: ¹⁰</p> <p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier document but published on or after the international filing date</p> <p>"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p> <p>"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</p> <p>"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step</p> <p>"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.</p> <p>"&" document member of the same patent family</p>		
IV. CERTIFICATION		
Date of the Actual Completion of the International Search	Date of Mailing of this International Search Report	
22 January 1992	1 MAR 1992	
International Searching Authority	Signature of Authorized Officer	
ISA/US	 NGUYEN NGOC-HO Steven N. Meyers INTERNATIONAL DIVISION	

FURTHER INFORMATION CONTINUED FROM THE SECOND SHEET

A JS,A, 1,557,564 Daquino 29 October 1925

A JS,A 1,156,769 Fortin 12 October 1915

V. OBSERVATIONS WHERE CERTAIN CLAIMS WERE FOUND UNSEARCHABLE ¹

This international search report has not been established in respect of certain claims under Article 17(2) (a) for the following reasons:

1. Claim numbers _____, because they relate to subject matter ¹² not required to be searched by this Authority, namely:2. Claim numbers _____, because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out ¹³, specifically:3. Claim numbers _____, because they are dependent claims not drafted in accordance with the second and third sentences of PCT Rule 6.4(a).**VI. OBSERVATIONS WHERE UNITY OF INVENTION IS LACKING ²**

This International Searching Authority found multiple inventions in this international application as follows:

1. As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims of the international application.2. As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims of the international application for which fees were paid, specifically claims:3. No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claim numbers:4. As all searchable claims could be searched without effort justifying an additional fee, the International Searching Authority did not invite payment of any additional fee.

Remark on Protest

 The additional search fees were accompanied by applicant's protest. No protest accompanied the payment of additional search fees.