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SUPERINTENDENCIA DE INDUSTRIA Y COMI

División de Nuevas Creaciones

BOGOTA D.C.

SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO



No. 07-022292- -00001-0000

Fecha: 2008-04-24 15:14:59 Dep. 2020 NUECREACIONE
Tra. 2 PATENTES Eve: 1 REGDEPOSITO
Act. 538 PETICION Folios: 2

Expediente No. **07 022.292**

Patente de Invención **PROCEDIMIENTO PARA LA FABRICACIÓN DE PUNTERAS EN PLÁSTICO REFORZADO CON FIBRA DE VIDRIO PARA CALZADO DE SEGURIDAD.**

Solicitante: **JUAN DAVID VANEGAS JARAMILLO
JUAN CARLOS CARDONA CIRO**

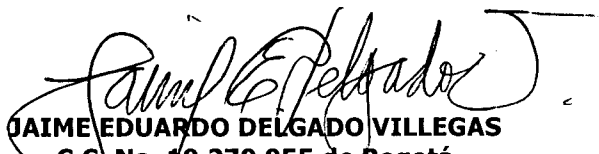
JAIME EDUARDO DELGADO VILLEGAS, abogado, mayor y vecino de Bogotá D.C., identificado con la Cédula de Ciudadanía No. 19.270.955 de Bogotá D.C. y Tarjeta Profesional de Abogado No. 43.308 del Consejo Superior de la Judicatura, con el fin de dar cumplimiento a lo ordenado por el Artículo 44 de la Decisión 486 del Acuerdo de Cartagena, por medio del presente memorial adjunto el recibo No. 08-30, 920 de Abril 16 de 2008, en la suma de \$420,000.00 con el fin de que su Digno Despacho examine si esta Invención es Patentable.

Lo anterior, debido a que la solicitud de esta Patente de Invención fue publicada en la Gaceta de Propiedad Industrial No. 590 de Marzo 31 de 2008.

Notificaciones

Las escucharé en la Secretaría de su Despacho o en mi Oficina de Abogado ubicada en la Avenida Carrera 24 No. 37 – 31 Oficina 202. Teléfonos 2444096 - 3690624

Atentamente,


JAIME EDUARDO DELGADO VILLEGAS
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SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO



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SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO

*Este recibo debe ser utilizado
Únicamente para tramites de*

NIT : 800170489-2

*P. mención → procedimiento para la fabricación
de puntas en plástico reforzado
con fibra de vidrio para cuidado de
seguridad*
07 022.292

RECIBO OFICIAL DE CAJA : 08 - 30,920
FECHA : ABRIL 16 DE 2008

***** CONSIGNACION *****

DEPOSITANTE	TIPO PAGO	BANCO	CUENTA	No. PAGO	FECHA PGO	Vr. PAGO
MARIO DELGADO ECHEVERRY	CONSIGNACION	BANCO DE BOGOTA	062754387	3179186	16/04/2008	14,135,000.00

***** CONCEPTO *****

CANT.	RENTISTICO	CONCEPTO	TOTAL CONCEPTO
1	50005-01-01	SOLICITUDES	
		85 EXAMEN DE PATENTABILIDAD DE INVEN	420,000.00
		TOTAL :	\$ 420,000.00

SON: CUATROCIENTOS VEINTE MIL PESOS

RESPONSABLE : _____

RECIBO DE CAJA APLICADO AL EXPEDIENTE No. _____



US 20020108270A1

(19) **United States**
(12) **Patent Application Publication** (10) **Pub. No.: US 2002/0108270 A1**
Williams (43) **Pub. Date: Aug. 15, 2002**

(54) **PLASTIC TOE CAP AND METHOD OF MAKING** (52) **U.S. Cl. 36/77 R**

(76) **Inventor: Jason L. Williams, Erie, PA (US)** (57) **ABSTRACT**

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(21) **Appl. No.: 10/116,412**
(22) **Filed: Apr. 4, 2002**

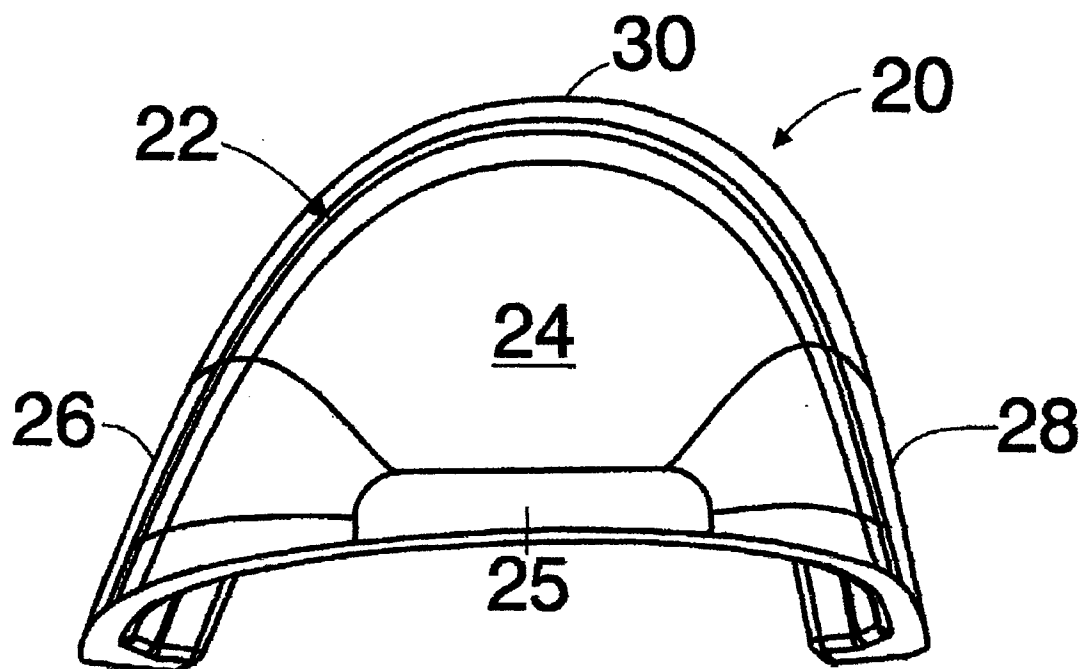
Related U.S. Application Data

(62) **Division of application No. 09/739,461, filed on Dec. 18, 2000, now Pat. No. 6,367,170.**

Publication Classification

(51) **Int. Cl.⁷ A43C 13/14**

A toe cap is a reinforcement member made of thermoset structural composite material with a tensile strength of 30,000 psi, a tensile modulus of 2.5×10^6 psi, a compression strength of 35,800 psi, a specific gravity of 1.85, and a Barcol hardness of 65. More preferably, the material has a tensile strength of at least 50,000 psi, a tensile modulus of at least 3.8×10^6 psi, a compression strength of at least 42,000 psi, a specific gravity of at least 1.90, and a Barcol hardness of at least 70. A suitable family of materials is a thermoset vinyl ester based sheet molding compound reinforced with glass fiber and/or carbon fiber. The sheet molding compound has fiber content of about 63% and a typical fiber length of one inch. The maximum wall thickness of the upper portion of the toe cap is in the range of between 0.100 inch and 0.250 inch.



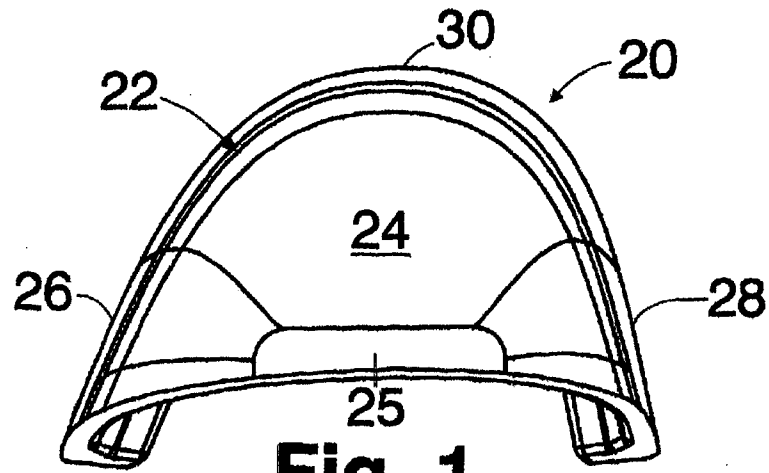


Fig. 1

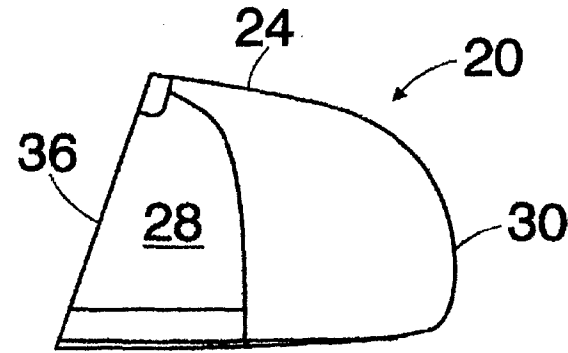


Fig. 2

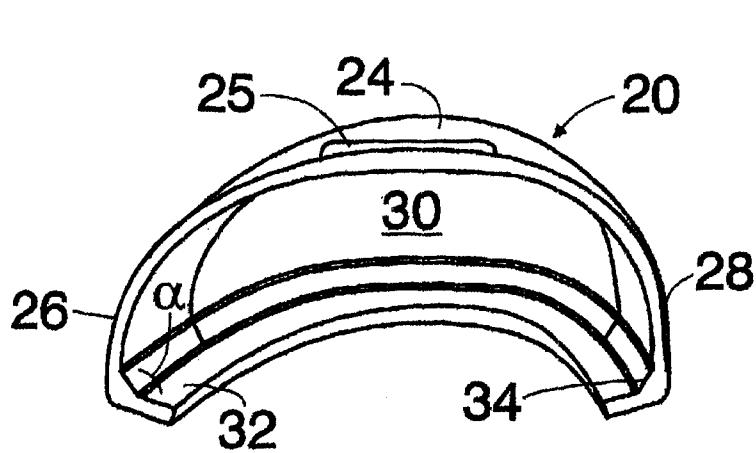


Fig. 3

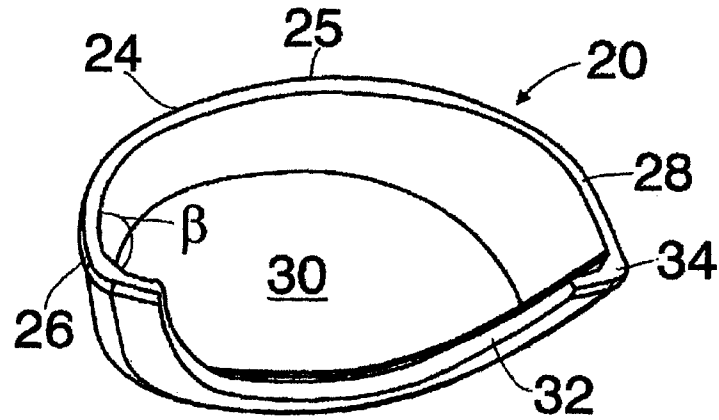


Fig. 4

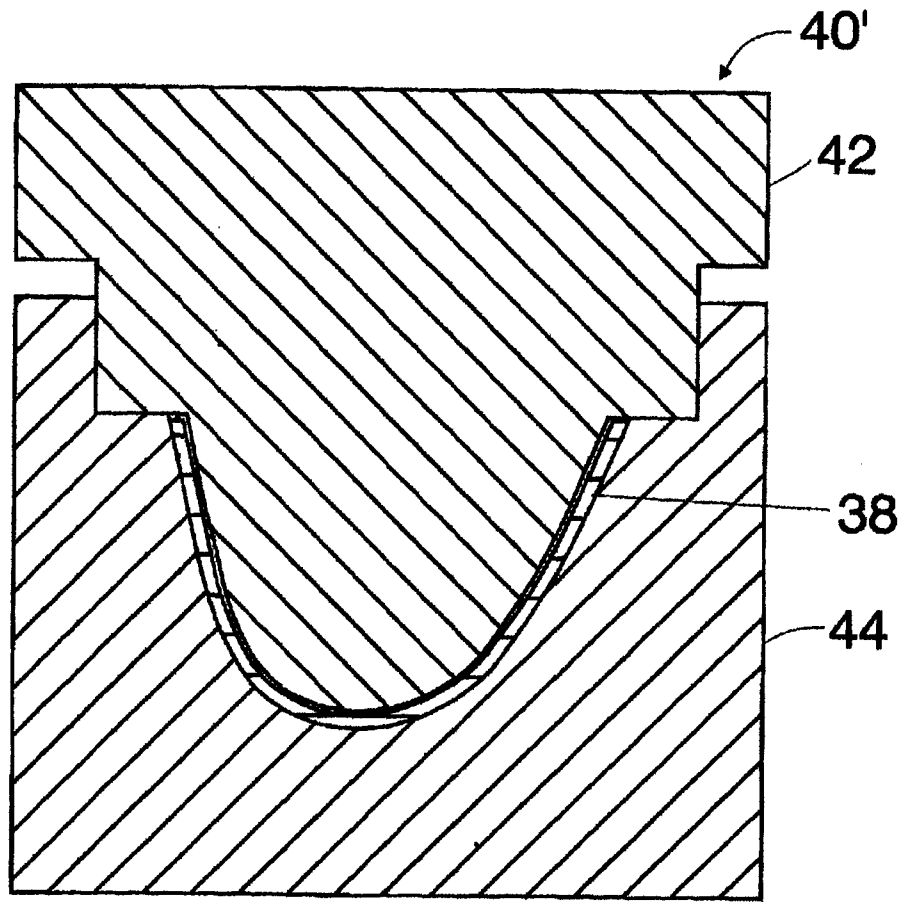


Fig. 5

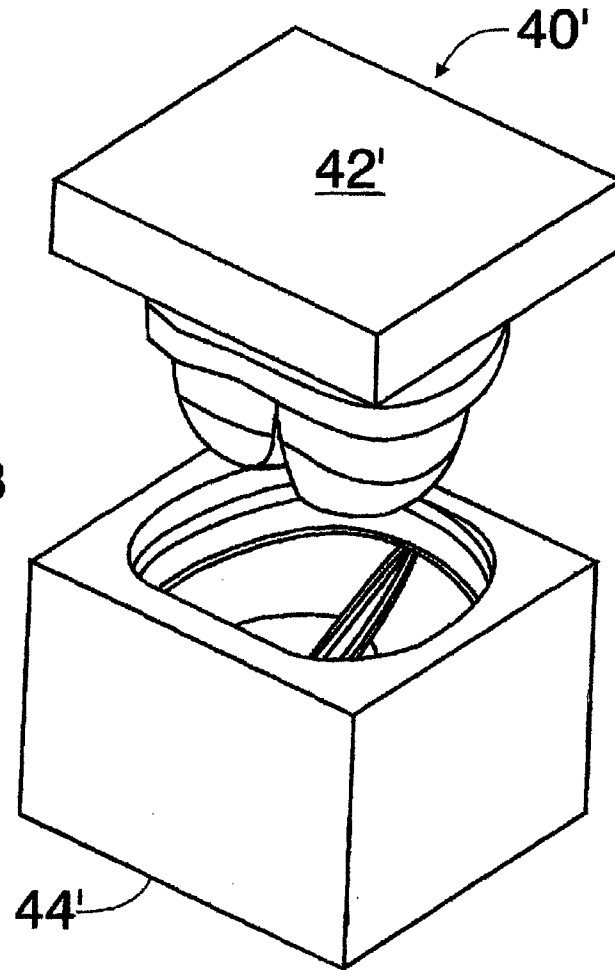


Fig. 6a

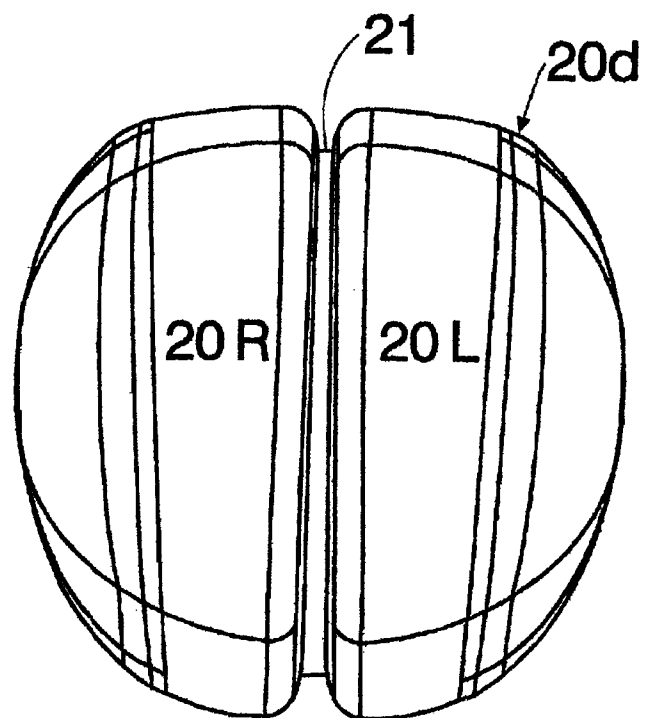


Fig. 7a

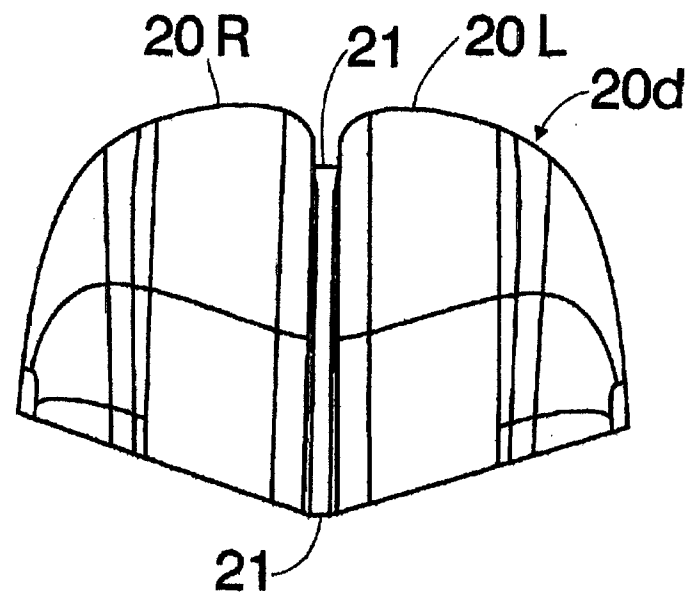


Fig. 7b

tensile strength of at least 30,000 psi, a tensile modulus of at least 2.5×10^6 psi, a compression strength of at least 35,800 psi, a specific gravity of at least 1.85, and a Barcol hardness of at least 65. More preferably, the toe cap 20 is made of a material which has a tensile strength of at least 50,000 psi, a tensile modulus of at least 3.8×10^6 psi, a compression strength of at least 42,000 psi, a specific gravity of at least 1.90 and a Barcol hardness of at least 70. Materials which have the desired properties include vinyl ester based sheet molding compounds reinforced with glass fibers, the compound having 63% by weight glass fibers of lengths in the range between about $\frac{1}{2}$ inch and two inches. A family of vinyl ester based composites is identified as QC 8000 series available from Quantum Composites of Midland Mich., with a specific preferred material identified as QC 8800.

[0018] FIG. 5 depicts a first shaping mold 40 useful in making the toe cap of the present invention. Mold 40 is a single cavity mold. The process of making toe cap 20 comprises cutting a swatch 38 of fiber reinforced, vinyl ester based sheet molding compound to a predetermined size which is generally slightly larger than the longitudinal and lateral. The swatch is then inserted into shaping mold which has first male half 42 and second female half 44. The mold halves 42 and 44 define a desired shape of the toe cap 20. The next step in the method of making toe cap 20 involves compressing the swatch to a pressure between 200 psi and 1000 psi in said shaping mold producing a maximum thickness in an upper portion of said toe cap which falls in the range of between 0.062 inch and 0.250 inch. The swatch 38 is cured in the mold at a temperature between 240° and 320° F. for a period of between 1 and 4 minutes. The shaped toe cap 20 is then ejected from the mold 40. A second mold (not shown) having a cross section which is a mirror image of that shown in FIG. 5 is used to produce a right toe cap 20 to complete the pair.

[0019] FIGS. 6a and 6b show a second mold 40' which simultaneously forms a left toe cap 20L and a right toe cap 20R (FIGS. 7a and 7b). A swatch 38' which is more than twice the dimensions of a single toe cap 20 is inserted into female mold half 44' and male mold half 42' is lowered into female mold half 44' and the process defined in conjunction with molding a single toe cap 20 as described in conjunction with FIG. 5 above is carried out. Ejection pins (not shown) are inserted through apertures 45 to remove the double toe cap 20d from female mold half 44'. Once the double toe cap 20d is ejected from mold 40' (FIGS. 7a and 7b), right toe cap 20R and left toe cap 20L are separated by cutting through interconnecting membrane 21 that has a width of a single blade thickness.

[0020] The toe cap 20 of the present invention has improved tensile strength, compressive strength and impact resistance as compared to other plastic toe caps. In addition, the toe cap 20 does not suffer from the deficiencies associated with metal toe caps including permanent deformation, electrical conductivity and magnetic interaction. The toe cap 20 of the present invention has successfully passed the compression and impact tests of the ANSI and standards of other foreign countries.

[0021] Various changes, alternatives and modifications will become apparent to one of ordinary skill in the art following a reading of the foregoing specification. It is intended that any such changes, alternatives and modifica-

tions as fall within the scope of the appended claims be considered part of the present invention.

I claim:

1. A toe cap for reinforcement of shoes, boots and the like, comprising:

a reinforcement member having a generally C-shaped cross section, said reinforcement member being made of thermoset structural composite material with a tensile strength of at least 30,000 psi, a tensile modulus of at least 2.5×10^6 psi, a specific gravity of at least 1.85, and a Barcol hardness of at least 65.

2. The toe cap of claim 1 wherein said material has a compression strength of at least 35,800 psi.

3. The toe cap of claim 1 wherein said reinforcement member has a tensile strength of at least 50,000 psi, a tensile modulus of at least 3.8×10^6 psi, a specific gravity of at least 1.90 and a Barcol hardness of at least 70.

4. The toe cap of claim 3 wherein said material has a compression strength of at least 42,000 psi.

5. The toe cap of claim 1 wherein said generally C-shaped reinforcement member comprises

a) an upper portion including a top surface and a generally vertical wall portion and,

b) a substantially horizontal base.

6. The toe cap of claim 5 wherein said generally vertical wall portion is interconnected to said substantially horizontal base by a chamfer.

7. The toe cap of claim 6 wherein said chamfer forms an angle with said base in a range of between 120° and 150°.

8. The toe cap of claim 7 wherein said chamfer forms an angle of generally 135° with said base.

9. The toe cap of claim 5 wherein said upper portion has a maximum thickness which falls in the range of between 0.100 inch and 0.250 inch.

10. The toe cap of claim 9 wherein said upper portion has a thickened region across an instep which is as much as 0.050 inch thicker than other portions of said toe cap.

11. The toe cap of claim 1 wherein said toe cap is made of a fiber reinforced, vinyl ester based sheet molding compound.

12. A process of making a toe cap comprising the steps of

a. cutting a swatch of fiber reinforced, vinyl ester based sheet molding compound to a predetermined size;

b. inserting said swatch in a shaping mold having a male and female member which between them, define a desired shape of said toe cap;

c. compressing said swatch to a pressure between 200 psi and 1000 psi in said shaping mold producing a maximum thickness in an upper portion of said toe cap which falls in the range of between 0.100 inch and 0.250 inch;

d. curing said swatch at a temperature between 240° and 320° F. for a period of between 1 and 4 minutes;

e. ejecting said toe cap from said shaping mold.

13. The process of claim 12 wherein said cutting step comprises cutting a swatch with a predetermined size which is greater than twice the size of said toe cap and said inserting step involves inserting said swatch into a double wide mold capable of simultaneously shaping a left toe cap and a right toe cap.

United States Patent [19]
Shafir

[11] Patent Number: 4,817,222
[45] Date of Patent: Apr. 4, 1989

- [54] METHOD AND APPARATUS FOR MAKING SHOE LASTS AND/OR SHOE COMPONENTS
- [76] Inventor: Aharon Shafir, Leon Blum St. 9, Tel Aviv, Israel
- [21] Appl. No.: 109,297
- [22] Filed: Oct. 15, 1987
- [51] Int. Cl.⁴ A43D 1/04; A43D 1/00
- [52] U.S. Cl. 12/146 L
- [58] Field of Search 12/146 L, 7 R; 364/474; 128/660

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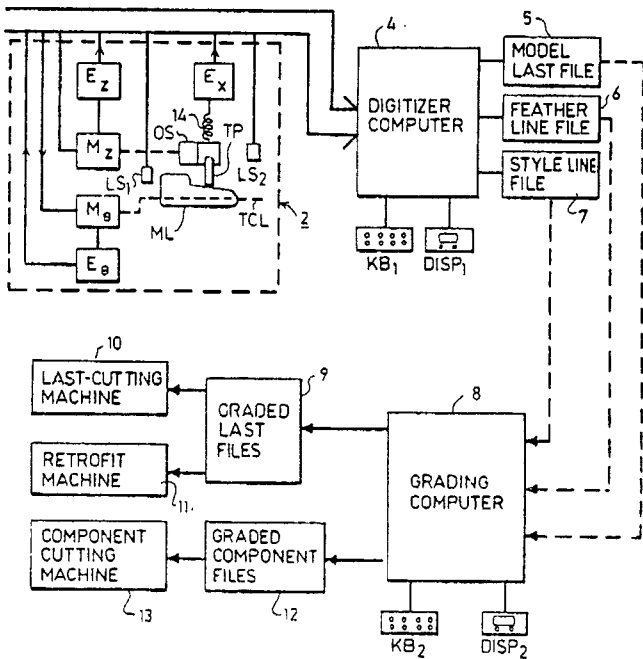
"The Story of Lasts" ©1948 issued by National Shoe Manufacturers Association.

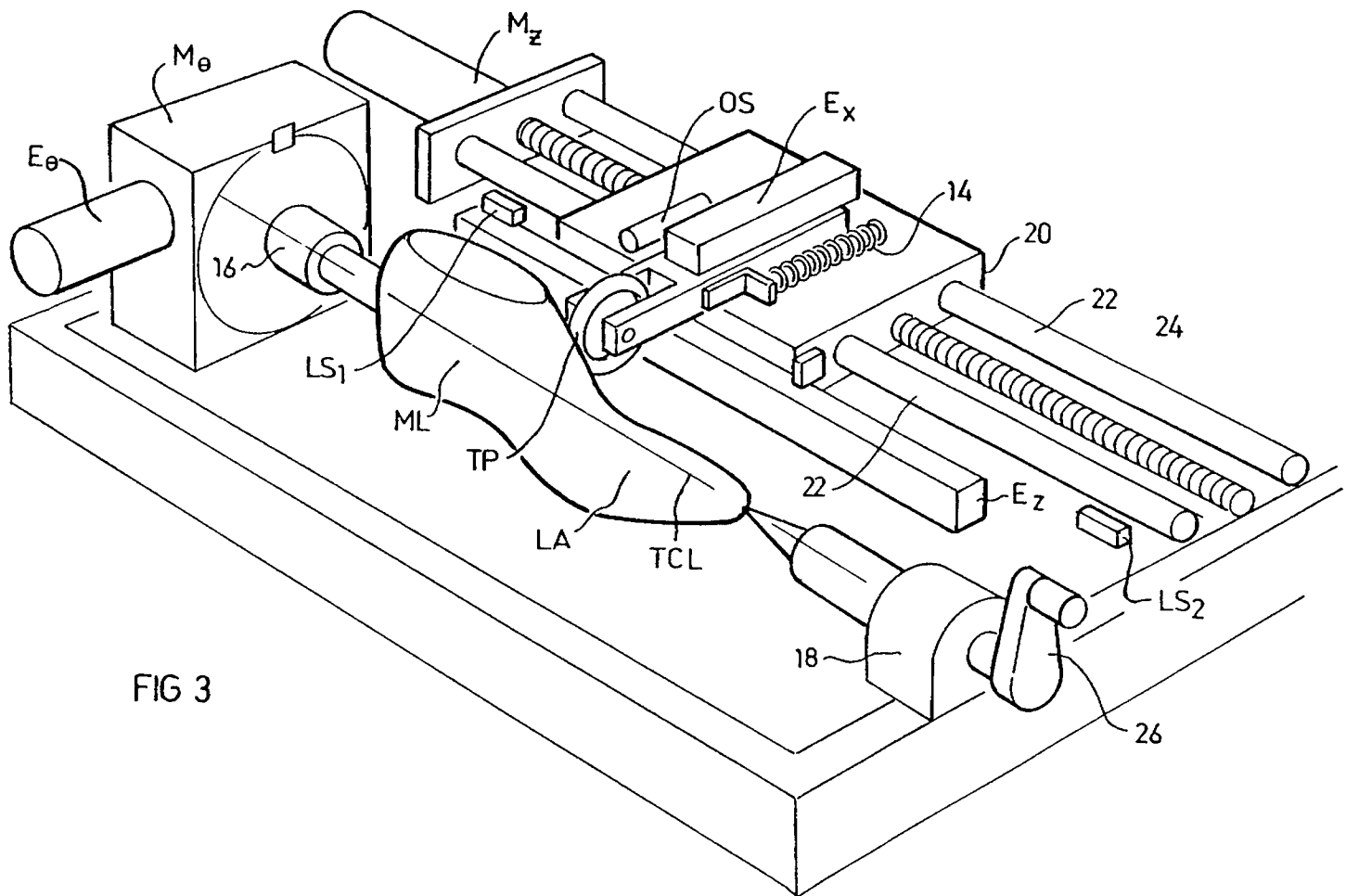
Primary Examiner—Steven N. Meyers
Attorney, Agent, or Firm—Donald Brown; Benjamin J. Barish

[57] ABSTRACT

A method and apparatus for making shoe lasts, involves digitizing on the fly a large number of sample points on the outer surface of a model last representing a particular shoe style to produce a model last digital file representing the three-dimensional surface contour of the respective model last; grading the model last digital file to produce one or more graded last digital files each representing a different last size of the respective shoe style; and utilizing each of the graded last digital files to produce a graded shoe last of the respective shoe style. The invention may also be utilized for making graded components of shoes, and for modifying shoe styles or creating new shoe styles by CAD/CAM techniques.

29 Claims, 14 Drawing Sheets





tracer probe at each sample point to represent the "tool" path points (i.e., the center point of the tracer wheel) on the three-dimensional surface contour of the respective model last; and the grading operation converts the tool path points to "part" points on the surface of the model last, grades the part points to represent different lengths and widths of lasts of the respective shoe style, and then reconverts the graded part points to tool path points in the graded digital files.

In a second described embodiment, the digitizing means comprises an optical device directing an optical beam, such as a laser beam, against the outer surface of the model last as the model last is rotated about its longitudinal axis, and as the optical beam is advanced parallel to the longitudinal axis of the model last. In this described embodiment, the digitizing operation directly measures the part points on the surface of the model last; and the grading operation grades the part points to represent different lengths and widths of lasts of the respective shoe style, and then converts the graded part points to tool path points in the graded digital files.

As will be described more particularly below, the novel method and apparatus may be used for making graded shoe lasts, and also graded components of shoes, in a quick and efficient manner as compared to the present techniques. Moreover, the method and apparatus of the present invention permits various "holding" techniques to be conveniently applied in order to hold a particular dimension of the shoe last for more than one grade, or to provide a disproportionate change in one or more dimensions with respect to the other dimensions among different grades. Such techniques may be used to avoid distortions in the graded shoes, and also to minimize the initial tooling required to make the shoe components.

The method and apparatus may be embodied in new equipment specifically designed for making shoe lasts or components in accordance with the invention, or may be added to existing equipment, e.g., of the pantographic type, to retrofit such equipment for making graded shoe lasts in accordance with the present invention.

Further features and advantages of the invention will be apparent from the description below.

BRIEF DESCRIPTION OF THE DRAWINGS

The invention is herein described, by way of example only, with reference to the accompanying drawings, wherein:

FIG. 1 is a block diagram illustrating one form of apparatus constructed in accordance with the present invention for making shoe lasts and/or shoe components;

FIG. 2 illustrates a typical model last representing a particular shoe style used for producing graded lasts for the different sizes of the respective shoe style;

FIG. 3 illustrates the digitizing means included in the apparatus of FIG. 1;

FIG. 4 is a three-dimensional view illustrating the three axes defining the sample points on the outer surface of the model last;

FIG. 5 is a block diagram illustrating the digitizer computer in the system of FIG. 1;

FIG. 6 is a flow diagram illustrating the man-machine interface (MMI) software in the digitizer computer of FIG. 1;

FIG. 7 is a flow diagram illustrating the operation of the digitizer computer of FIG. 1;

FIG. 8 is a flow diagram illustrating the man-machine interface (MMI) software in the grading computer of FIG. 1;

FIG. 9 is a flow diagram illustrating the operation of the grading computer in the system of FIG. 1;

FIGS. 10a and 10b are diagrams helpful in explaining the manner of determining the part points i.e., the points on the surface of the model last, from the measured tool path points;

FIG. 11a illustrates a model last and one graded last produced therefrom, including different part of such lasts, and also illustrates the manner of modifying the change in one of the dimensions (i.e., toe spring) in the produced graded last to avoid distortions;

FIGS. 11b and 11c are diagrams illustrating, in full lines, lasts which have been graded proportionately, and in broken lines the modifications of the graded lasts in order to apply other "holding" techniques for avoiding distortions for minimizing initial tooling costs;

FIG. 12 is a flow diagram illustrating the application of a "bottom holding" technique in producing a graded last;

FIG. 13 is a last diagram helpful in explaining the heel-height holding technique;

FIG. 14 is a flow diagram explaining the heel-height holding technique applied to the last illustrated in FIG. 13;

FIGS. 15a and 15b are diagrams helpful in explaining the manner of modifying the digital data identifying each sample point on the surface contour of the last according to the "holding" technique applied to the last;

FIG. 16a illustrates a last having a number of style-lines marked thereon to indicate the configurations of different components used in manufacturing the shoe corresponding to the last;

FIG. 16b is a flow diagram illustrating the manner of using the style-lines in FIG. 16a for producing the graded components used to manufacture the shoes of the graded lasts;

FIG. 17 illustrates an optical digitizer, namely a laser system, which may be used for the digitizer in the system of FIG. 1; and

FIG. 18 is a flow diagram illustrating the operation of the grading computer when using the laser digitizer of FIG. 17.

DESCRIPTION OF PREFERRED EMBODIMENTS

Overall System Illustrated in FIG. 1

FIG. 1 is a block diagram illustrating an overall system for making shoe lasts in accordance with the present invention. The system includes a digitizer, within the block generally designated 2, which digitizes a large number of sample points on the outer surface of a model last ML representing a particular shoe last style. This digital information is outputted to a digital computer 4 which produces a model last digital file 5 representing the three-dimensional surface contour of the respective model last.

FIG. 2 illustrates one form of model last ML representing a particular shoe style. Among its other components, the illustrated model last ML includes a last bottom LB, a last heel LH, and last sides LS. The juncture line of the last sides LS with the last bottom LB and last heel LH is called the feather line FL, and is an important element in the shoe style of the respective last. As

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respect to the flow diagram of FIG. 9; rather, this step is omitted when using the laser probe LP.

FIG. 18 is a flow diagram, corresponding to that of FIG. 9, illustrating the operation of the grading computer 8 when the model last file 5 is produced by the laser probe LP digitizer of FIG. 17. Thus, each sample point in the model last file is the part contact point (P), instead of the tool-path point (T) in FIG. 9. The part contact points (P) are then graded for lengths and widths in the same manner as described above, and then the tool path points (T) are calculated according to the dimensions of the tool to be used in cutting the last. The kinematic calculations are then made as described above with respect to FIG. 9 to assure that the acceleration and other constraints are not exceeded, before the tool path points are recorded in the produced CNC file.

APPLICATIONS OF THE INVENTION

As indicated above, the described method and apparatus may be embodied in new equipment specifically designed for making shoe lasts or for making the graded components used in manufacturing the shoes. The invention may also be embodied in existing equipment, e.g., of the pantographic type, to retrofit such equipment for making graded shoe lasts. Further, the invention may also be used in CAD/CAM (computer-aided design/computer-aided manufacture) equipment, for changing styles or creating new styles, by enabling the style-designing artisan to display on the screen the image of the model last from the digital data generated by the digitizer computer, and then to manipulate the displayed image, according to the above-described "holding" techniques or other known graphic manipulating techniques, to modify the displayed style or to create new styles.

Many other variations, modifications and applications of the invention may be made.

What is claimed is:

1. A method of making shoe lasts, comprising the operations:

digitizing a large number of sample points on the outer surface of a model last representing a particular shoe style to produce a model last digital file representing the three-dimensional surface contour of the respective model last;

grading said model last digital file to produce one or more graded last digital files each representing a different last size of the respective shoe style;

and utilizing each of said graded last digital files to produce a graded shoe last of the respective shoe style.

2. A method of making shoe lasts, comprising the operations:

digitizing a large number of sample points on the outer surface of a model last representing a particular shoe style to produce a model last digital file representing the three-dimensional surface contour of the respective model last;

grading said model last digital file to produce one or more graded last digital files each representing a different last size of the respective shoe style;

and utilizing each of said graded last digital files to produce a graded shoe last of the respective shoe style.

wherein the outer surface of the model last is digitized by a tracer probe which is spring-urged into contact with the outer surface of the model last as the model last is continuously rotated about its

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longitudinal axis and as the tracer probe is advanced parallel to the longitudinal axis of the model last.

3. The method according to claim 2, wherein the digitizing operation measures the instantaneous position of the tracer probe at each sample point to represent the tool path points at the three-dimensional surface contour of the respective model last; and the grading step converts said tool path points to surface points of the model last, grades said surface points to represent different lengths and widths of lasts of the respective shoe style, and then reconverts said graded surface points to graded tool path points in the graded digital files.

4. A method of making shoe lasts, comprising the operations:

digitizing a large number of sample points on the outer surface of a model last representing a particular shoe style to produce a model last digital file representing the three-dimensional surface contour of the respective model last;

grading said model last digital file to produce one or more graded last digital files each representing a different last size of the respective shoe style;

and utilizing each of said graded last digital files to produce a graded shoe last of the respective shoe style.

wherein the outer surface of the model last is digitized by an optical device directing an optical beam against the outer surface of the model last as the model last is continuously rotated about its longitudinal axis and as the optical beam is advanced parallel to the longitudinal axis of the model last.

5. The method according to claim 4, wherein the digitizing operation directly measures the surface points on the model last, and the grading step grades said surface points to represent different lengths and widths of lasts of the respective shoe style, and then converts said graded surface points to graded tool path points in the graded digital files.

6. A method of making shoe lasts, comprising the operations:

digitizing a large number of sample points on the outer surface of a model last representing a particular shoe style to produce a model last digital file representing the three-dimensional surface contour of the respective model last;

grading said model last digital file to produce one or more graded last digital files each representing a different last size of the respective shoe style;

utilizing each of said graded last digital files to produce a graded shoe last of the respective shoe style;

digitizing a large number of sample points on the feather line of the model last to produce a feather line digital file representing the feather line of the respective model last;

and utilizing said feather line digital file, together with said model last digital file, for producing said one or more graded last digital files of the respective shoe style.

7. The method according to claim 6, wherein the outer surface of the model last is digitized by a tracer probe which is spring-urged into contact with the outer surface of the model last as the model last is continuously rotated about its longitudinal axis and as the tracer probe is advanced parallel to the longitudinal axis of the model last.

8. The method according to claim 7, wherein the model last is of electrically-insulating material except