

Description

Manufacturing system for "assembled" shoe with shock-absorbing insert in the heel.

This patent application for industrial invention relates to a manufacturing system for an "assembled" shoe provided with shock-absorbing insert in the heel.

The patent protection is also extended to the shoe obtained with the system according to the invention.

An "assembled" shoe is a shoe obtained by using a last that reproduces the shape of the foot. The upper is put on the last and the lower ends of the upper are rolled up, stretched and fixed under the intermediate sole that has been previously fixed on the surface of the last, with the possibility to remove it.

After the upper is applied to the intermediate sole, the sole and the heel are applied and fixed under the intermediate sole.

The purpose of the present invention is to innovate this technique, which has been used for a very long time, in order to obtain a space on the resting area of the heel used to contain an insert made of soft, elastically deformable material, able to absorb the impact of the heel on the ground every time the foot touches the ground when walking.

All sports and leisure time shoes, such as running, basketball or volleyball shoes, are normally provided with a moulded bottom with elastic inserts, such as cushions made of soft rubber or rings full of air, designed to cushion the impact of the heel with the ground when running or jumping.

The said inserts have been exclusively used by the shoes provided with a moulded bottom, in which cavities of any shape or deep can be obtained during moulding to house the said inserts, which are normally covered by the insole, being of removable, washable and interchangeable type.

In case of "assembled" shoes, the edges of the upper are rolled up and fixed on the perimeter between the intermediate sole and the sole, in such

a way that the insole practically covers the upper side of the intermediate sole, on which housings for the shock-absorbing inserts are impossible to obtain.

The heel is always rigid and finished with a heel layer, and therefore there
5 is no space or way to introduce an anti-shock insert in "assembled" shoes.
As mentioned above, the purpose of the present invention is to innovate the traditional manufacturing system of "assembled" shoes, in order to provide these classical shoes with the shock-absorbing inserts that have been so far exclusively used in sports shoes provided with moulded
10 bottoms.

According to the manufacturing system of the invention, a new "last" is used, being characterised by a sort of heel that, once the shoe has been finished and removed from the said "last", creates a lowered housing inside the shoe, which is deep enough to receive a shock-absorbing insert
15 designed to be covered and hidden under a traditional insole.

For major clarity the description of the system of the invention continues with reference to the enclosed drawings, which only have an illustrative, not limiting sense, in which the sequence of operational steps is explained with diagrammatic figures that show the semi-finished product obtained
20 from each work phase.

Figure 1 is a side view of the special "last" used for the actuation of the manufacturing system of the invention.

Figure 2 is a three-quarter view in reversed position of the special "last" used for the actuation of the manufacturing system of the invention.

25 Figure 3 is a diagrammatic view of the shock-absorbing insert designed to be inserted in the shoe obtained with the manufacturing system of the invention.

Figures 4A to 4F are cross-sections with a longitudinal plane of the shoe during the different manufacturing steps according to a first preferred
30 embodiment of the system of the invention.

Figures 5A to 5F are cross-sections with a longitudinal plane of the shoe during the different manufacturing steps according to a second preferred

embodiment of the system of the invention.

Figures 6A to 6F are cross-sections with a longitudinal plane of the shoe during the different manufacturing steps according to a third preferred embodiment of the system of the invention.

5 Figure 7 is a diagrammatic view of a "sack" upper for the manufacturing of moccasins.

With reference to figures 1 and 2, the manufacturing system of the invention uses a special "last" (1), of the type formed of a heel (1a) and a mid-sole (1b) connected by a spring (M), which allows to lift the heel (1a)
10 with respect to the mid-sole (1b), thus permitting to remove the shoe from the last (1) when all the work processes to be performed on the last (1) are completed.

The peculiarity of the said last (1) with traditional structure is that it is provided with a heel (1a) that incorporates a sort of heel (1c) connected
15 with the heel by means of a step (1d), since the heel (1c) is slightly smaller than the heel (1a).

Moreover, the manufacturing system of the invention uses a special rigid frame (2) surrounding the heel (1c) and consisting in a horseshoe collar, preferably, but not necessarily, closed with a lower base (2a) used to cover
20 the lower side of the heel (1c) when the frame (2) is coupled with the last (1).

Furthermore, the manufacturing system of the invention uses a shock-absorbing insert (3) housed inside the shoe under the heel.

According to a preferred embodiment, the manufacturing system of the invention includes the following sequence of work phases:
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- a) dovetail application of the frame (2) on the heel (1c) of the last (1), as shown in fig. 4A;
- b) fixing of a traditional intermediate sole (4) with known means and with possibility of removal, under the last (1), whose lower sole is completely
30 covered from the toe to the heel by the said intermediate sole (4), whose central section (4a) is slightly double-folded to surmount the transversal front edge (1c') of the heel (1c), as shown in fig. 4B;

- c) fitting of the upper (5) on the last (1);
- d) rolling up, stretching and fixing of the perimeter edges (5a) of the upper (5) by known means under the edges of the intermediate sole (4), thus hiding the horseshoe frame (2) that remains covered by the upper (5), as shown in fig. 4C;
- a) application and fixing of a traditional sole (6) on the intermediate sole (4), as shown in fig. 4D;
- a) application and fixing of a heel layer (7) on the sole (6) with known means, as shown in fig. 4E;
- g) removal of the shoe from the last (1) and fitting of the shock-absorbing insert (3), with the same shape and size as the heel (1c), in such a way that it can be exactly housed in the space (8) surrounded by the horseshoe frame (2) and designed to be permanently incorporated in the finished shoe (S), hidden under a traditional insole (9) that also covers the insert (3), as shown in fig. 4F.

The finished shoe (S) is aesthetically characterised by the presence of a heel coated with the upper (5), which continuously extends from the opening border (B) of the shoe (B) to the false heel, being only interrupted on the heel layer (7). If the user prefers to give a traditional design to the shoe (S), with the upper (5) that leaves the heel uncovered, it would be simply necessary to postpone the first work phase described in a) as indicated below:

A) fixing of a traditional intermediate sole (4) with known means and with possibility of removal, under the last (1), whose lower sole is completely covered from the toe to the heel by the said intermediate sole (4), whose central section (4a) is slightly double-folded to surmount the transversal front edge (1c') of the heel (1c), as shown in fig. 5A;

c) fitting of the upper (5) on the last (1);

C) rolling up, stretching and fixing of the perimeter edges (5a) of the upper (5) by known means under the edges of the intermediate sole (4), as shown in fig. 5B;

D) dovetail application on the heel (1c) of the horseshoe frame (2), which

covers the upper (5) in the section of upper (5) that surrounds and covers the heel (1c), as shown in fig. 5C;

E) application and fixing of a traditional sole (6) on the intermediate sole (4), as shown in fig. 5D;

5 F) application and fixing of a heel layer (7) on the sole (6) with known means, as shown in fig. 5E;

G) removal of the shoe from the last (1) and fitting of the shock-absorbing insert (3), with the same shape and size as the heel (1c), in such a way that it can be exactly housed in the space (8) surrounded by the horseshoe
10 frame (2) and designed to be permanently incorporated in the finished shoe (S), hidden under a traditional insole (9) that also covers the insert (3), as shown in fig. 5F.

According to this implementation mode of the system of the invention, in which the frame (2) remains visible on the outside of the shoe (S), it is
15 necessary to use a frame (2) with an external surface that imitates leather or multilayer leather or coated by a leather or multilayer leather strip, in such a way that the frame (2) perfectly imitates the aesthetical appearance of traditional heels.

The manufacturing system of the invention can also be used with "sack"
20 uppers whose edges are folded laterally and upwards around the last (1) instead of under the last (1); this type of uppers completely surround the sole of the last (1) and are used to produce moccasins.

The only measure to be taken is to provide a large opening (50a) on the "sack" upper (50) under the heel of the foot, as shown in fig. 7.

25 When the "sack" upper is fitted on the last (1), the heel (1c) of the last (1) is inserted and protrudes from the said opening.

In this case the manufacturing system of the invention includes the following sequence of work steps:

A1) inserting of the sack upper (50) on the last (1), in such a way that the
30 heel (1c) is inserted and protrudes from the opening (50a) on the sack upper (50), as shown in fig. 6A;

B1) rolling up, stretching and fixing of the perimeter edges (50b) of the

upper (50) by known means on the edges of the upper flap (P) of the shoe, as shown in fig. 6B;

C1) dovetail application of the horseshoe frame (2) on the heel (1c), as shown in fig. 6C;

- 5 D1) application and fixing of a traditional sole (6) under the sack upper (50) with known means, as shown in fig. 6D;

E1) application and fixing of a heel layer (7) on the sole (6) with known means, as shown in fig. 6E;

- 10 G1) removal of the shoe from the last (1) and fitting of the shock-absorbing insert (3), with the same shape and size as the heel (1c), in such a way that it can be exactly housed in the space (8) surrounded by the horseshoe frame (2) and designed to be permanently incorporated in the finished shoe (S), hidden under a traditional insole (9) that also covers the insert (3), as shown in fig. 6F.

- 15 In this case the insert (3) is housed inside the space (8) thanks to the presence of a suitable opening (50b) on the "sack" upper (50).

Claims

- 1) Manufacturing system for a shoe with shock-absorbing insert in the heel, **characterised in that** it uses:
- a special last (1) of the type formed of a heel (1a) and a mid-sole (1b) connected by a spring (M), in which the heel (1a) incorporates a sort of heel (1c) connected with the heel by means of a step (1d), since the heel (1c) is slightly smaller than the heel (1a);
 - a special rigid frame (2) that surrounds the heel (1c) and basically consists in a horseshoe collar;
 - a shock-absorbing insert (3) housed inside the shoe (S) under the heel;
- and characterised in that it includes the following sequence of work steps:
- a) dovetail application of the frame (2) on the heel (1c) of the last (1);
 - b) fixing of a traditional intermediate sole (4) with known means and with possibility of removal, under the last (1), whose lower sole is completely covered from the toe to the heel by the said intermediate sole (4), whose central section (4a) is slightly double-folded to surmount the transversal front edge (1c') of the heel (1c);
 - c) fitting of the upper (5) on the last (1);
 - d) rolling up, stretching and fixing of the perimeter edges (5a) of the upper (5) by known means under the edges of the intermediate sole (4), thus hiding the horseshoe frame (2) that remains covered by the upper (5);
 - a) application and fixing of a traditional sole (6) on the intermediate sole (4);
 - f) application and fixing of a heel layer (7) on the sole (6) with known means;
 - g) removal of the shoe from the last (1) and fitting of the shock-absorbing insert (3), with the same shape and size as the heel (1c), in such a way that it can be exactly housed in the space (8) surrounded by the horseshoe frame (2);
 - h) fitting of an insole (9) inside the shoe (S) designed to hide the insert (3).
- 2) Manufacturing system for a shoe with shock-absorbing insert in the

heel, **characterised in that** it uses:

- a special last (1) of the type formed of a heel (1a) and a mid-sole (1b) connected by a spring (M), in which the heel (1a) incorporates a sort of heel (1c) connected with the heel by means of a step (1d), since the heel (1c) is slightly smaller than the heel (1a);
 - a special rigid frame (2) that surrounds the heel (1c) and basically consists in a horseshoe collar;
 - a shock-absorbing insert (3) housed inside the shoe (S) under the heel; and **characterised in that** it includes the following sequence of work steps:
- b) fixing of a traditional intermediate sole (4) with known means and with possibility of removal, under the last (1), whose lower sole is completely covered from the toe to the heel by the said intermediate sole (4), whose central section (4a) is slightly double-folded to surmount the transversal front edge (1c') of the heel (1c);
 - c) fitting of the upper (5) on the last (1);
 - C) rolling up, stretching and fixing of the perimeter edges (5a) of the upper (5) by known means under the edges of the intermediate sole (4);
 - D) dovetail application on the heel (1c) of the horseshoe frame (2), which covers the upper (5) in the section of upper (5) that surrounds and covers the heel (1c);
 - E) application and fixing of a traditional sole (6) on the intermediate sole (4) by means of known means;
 - F) application and fixing of a heel layer (7) on the sole (6) with known means;
 - G) removal of the shoe from the last (1) and fitting of the shock-absorbing insert (3), with the same shape and size as the heel (1c), in such a way that it can be exactly housed in the space (8) surrounded by the horseshoe frame (2);
 - H) fitting of an insole (9) inside the shoe (S) designed to hide the insert (3).
- 3) Manufacturing system for a shoe with shock-absorbing insert in the heel, **characterised in that** it uses:

- a special last (1) of the type formed of a heel (1a) and a mid-sole (1b) connected by a spring (M), in which the heel (1a) incorporates a sort of heel (1c) connected with the heel by means of a step (1d), since the heel (1c) is slightly smaller than the heel (1a);
- 5 - a special rigid frame (2) that surrounds the heel (1c) and basically consists in a horseshoe collar;
- a shock-absorbing insert (3) housed inside the shoe (S) under the heel;
- a sack upper (50) provided with a large opening (50a) in the area below the heel;
- 10 and **characterised in that** it includes the following sequence of work steps:
 - A1) inserting of the sack upper (50) on the last (1), in such a way that the heel (1c) is inserted and protrudes from the opening (50a) on the sack upper (50);
 - 15 B1) rolling up, stretching and fixing of the perimeter edges (50b) of the upper (50) by known means on the edges of the upper flap (P) of the shoe;
 - C1) dovetail application of the horseshoe-shaped frame (2) on the heel (1c);
 - D1) application and fixing of a traditional sole (6) under the sack upper (50)
 - 20 with known means;
 - E1) application and fixing of a heel layer (7) on the sole (6) with known means;
 - F1) removal of the shoe from the last (1) and fitting of the shock-absorbing insert (3), with the same shape and size as the heel (1c), in such a way
 - 25 that it can be exactly housed in the space (8) surrounded by the horseshoe-shaped frame (2);
 - G1) fitting of an insole (9) inside the shoe (S) designed to hide the insert (3).
- 4) System as claimed in any of the above claims, characterised in that the
- 30 horseshoe frame (2) is closed with a lower base (2a) used to cover the lower side of the heel (1c) when the frame (2) is coupled with the last (1).
- 5) System as claimed in claims 2, 3 and 4, characterised in that the

horseshoe frame (2) has an external surface finish that imitates leather or multilayer leather or is coated with a leather or multilayer leather strip.

6) Shoe obtained with the system claimed in any of the above claims.