(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) Publication number: **0 191 389**
A2

(12) EUROPEAN PATENT APPLICATION

(21) Application number: **86101340.7**

(22) Date of filing: **03.02.86**

(51) Int. Cl.⁴: **A 43 B 10/00**

(30) Priority: **14.02.85 IT 4151785**

(43) Date of publication of application: **20.08.86**
Bulletin 86/34

(84) Designated Contracting States: **AT BE CH DE FR LI NL SE**

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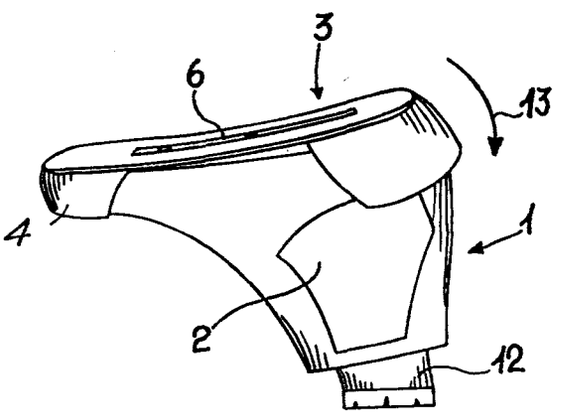
(54) Method of manufacturing footwear.

(57) The method comprises the steps of pre-forming a liner (1), an insole (3), an upper and a sole, and applying to them, where necessary, a bonding substance of the type which does not initially avail itself of adhesive properties but which is subsequently activable to assume curable, adhesive properties. Thereafter the liner (1) is placed on a support (12), an insole (3) mounted on the liner (1), the upper is then placed over the insole and liner, and finally the sole mounted on the upper. The thus assembled footwear item is then subjected to treatment for activating and curing the bonding substance to produce a finished item of footwear.



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"METHOD OF MANUFACTURING FOOTWEAR"

This invention relates to a method of manufacturing footwear articles.

Heretofore, footwear articles have been manufactured by methods which consist of fitting a footwear article over a last or former, using means of temporarily fastening the uppers to the former, comprising metal staples, and placing a toe piece and buttress in between the liner and upper, to provide the inside structure, which are then shaped around the former.

With this technology the individual parts which make up the footwear article are progressively sewn and glued at each individual assembly step to yield a finished product.

This procedure is time consuming, involves high manufacturing costs, and lowers plant output rates.

It is an object of this invention to provide a method of manufacturing footwear which affords, first and foremost, a reduction in production time.

A consequent object is to provide a method of manufacturing footwear which also affords a reduction in the equipment employed in the production line.

A further object is to provide a method of manufacturing footwear whereby a product of excellent and consistent quality can be obtained.

Still another object is to provide a method of manufacturing footwear which affords a reduction in the waiting time between processing operations.

A not least object is to provide a method of manufacturing footwear which affords a reduction in overall

production costs.

These and other objects, to become apparent herein below, are achieved by a method of manufacturing footwear characterized in that it comprises the following steps:

a) a) pre-forming footwear elements;

b) applying to said footwear elements, where necessary, a bonding substance of the type which is subsequently activable to assume adhesive properties;

c) assembling said footwear elements;

d) activation and subsequent curing of said bonding substance previously applied to said footwear elements.

Further features and advantages of the invention will be more clearly apparent from the following detailed description of a preferred embodiment given herein by way of non-limitative example and as shown in the accompanying drawing sheets, where:

Figures 1 to 4 are perspective views of a liner, an insole, an upper and a sole, respectively, for incorporation into a footwear item manufactured by the method according to the invention;

Figure 5 is a perspective view illustrating the first two assembly steps of the inventive method of manufacturing footwear;

Figure 6 is a perspective view showing a further, intermediate assembly step; and

Figure 7 is a perspective view of a completed item of footwear obtained by the method of manufacturing footwear according to the invention.

With reference to the cited drawing figures, the method of this invention provides for the utilisation of the elements or blanks shown in Figures 1 to 4.

Such elements comprise a first element, shown in Figure 1, consisting of a soft shoe or inner liner designated with the reference numeral 1, having a toe portion 1a, a heel portion 1b, advantageously including padding elements 2, and having substantially the same configuration as the inside portion of the footwear article to be obtained.

A second element, illustrated in Figure 2, comprises a rigid or semirigid insole 3, expediently incorporating a toe piece 4 and a rear buttress 5, which may be formed integrally therewith; said insole may also be selectively stiffened or strengthened where necessary by a stiffening blade or plate 6 fastened to the insole 3 either by fixing means such as rivets 7 or by gluing.

A third element illustrated in Figure 3 comprises a completed and finished upper 8.

A fourth element shown in Figure 4 comprises a sole 9 preferably having upturned or raised outer edges or a rand 10 and defining a tread 11.

All of these elements can be mass produced at low cost by employing conventional equipment and techniques commonly used in the art.

Obviously, the elements may be variously adapted according to the use for which the completed item of footwear is intended. For example, the inner liner 1

and/or the insole 3 may incorporate thermally insulating members, the insole 3 may constitute a mid-sole and a further anatomically shaped insole be provided.

This initial preparation of practically finished elements enables one to arrange for a magazine to feed the successively required elements where the method according to the invention is to be carried out automatically.

The first assembly step of the method, illustrated in Figure 5 consists of mounting the soft shoe 1 or liner over a merely supporting former 12, the second successive step involves mounting the preformed rigid or semirigid insole 3 onto the soft shoe 1 and former 12 by firstly, introducing the toe piece 4 of the insole 3 over the toe portion 1a of the soft shoe or liner 1 and then introducing the rear buttress 5 over the heel portion 1b of the liner 1, by moving the latter in the direction of the arrow 13, in Figure 5.

In a third assembly step, illustrated in Figure 6, the upper 8, is fitted onto the inner liner 1 and insole 3 by being introduced, in the direction of the arrow 14 over the preformed rigid or semirigid anatomical or the like insole 3, to thus also incorporate the soft shoe 1 or liner.

After this operation, the presence of the supporting inner former 12 is no longer compulsorily required because the assembled structure is imparted with rigidity by the rigid or semirigid insole 3 incorporating the toe piece 4 and buttress 5 which is included between the soft shoe 1 or liner and the upper 8.

In practice, the footwear article is practically assembled around this rigid or semirigid insole 3 which forms its framework and mechanical forming element.

Subsequently, in a fourth assembly step of the method of manufacturing footwear according to the invention the sole 9 is mounted on the assembly comprising the liner 1, insole 3, and upper 8, thus obtained.

Expediently, all the elements making up the footwear article are previously prepared by applying, where necessary adhesive or bonding substances of the type which initially do not avail themselves of adhesive qualities but are successively activable by ultrasonic or thermal or other activation means, for example, by pressure, to become adhesive and be cured when required.

By way of example, excellent results have been obtained in practice employing such adhesives sold under the trademarks "EVO-STICK" and "HELMITIN", through obviously other adhesives of the type cited may also be used. Advantageously, the assembled footwear elements are clamped by means such as clamping tools, before and during activation and curing of the bonding substances.

Thereafter, upon assembling the various elements of the footwear article according to the method steps described above, the thus assembled combination is subjected to the effect of devices known per se, capable of activating the adhesive over a sufficient

time to provide secure interconnection of all the assembled elements.

Obviously, the adhesive or bonding substance is applied at portions or surfaces of each element which will contact another element when the footwear is assembled. Such substance may be applied to the elements by any suitable technique, depending on the properties itself, such as spraying, brushing, rolling, etc.

At the end of such an operation, the footwear article is fully and perfectly assembled and finished without requiring any additional operation.

The method herein allows very fast assembling of the elements making up the footwear article, with a considerable reduction in the time presently necessary to carry out equivalent operations by means of traditional methods.

To carry out all the operations, no special equipment is required other than that which is conventional in that art, and on the contrary, the number of the items of equipment is greatly reduced in comparison with the equipment compulsorily used heretofore in footwear manufacturing production lines.

Furthermore, no operations are compulsorily required for fastening the various elements to the former as previously required, because in the method according to the invention the support or former 12 merely acts as a supporting member.

The whole structure is in fact substantially formed around the rigid or semirigid insole 3 which also forms a frame for the entire footwear article.

It has been found, in practice, that the method, according to the invention, by virtue of its simple implementation, affords the obtainment of footwear with greatly reduced manufacturing time and at lower cost than footwear obtained by other known methods.

The preparation of practically finished blanks or footwear elements which are then merely assembled around a rigid load-bearings structure, allows the obtainment of products of high quality and homogeneity which are not dependent on the skill of the assembly worker.

Thus, one can obtain mass production at high rates and low cost.

It may be seen from the foregoing description that all the objects set forth have been achieved, and more particularly a method has been provided which is extremely simple and whereby footwear of various types can be manufactured, which is of excellent quality, whilst achieving a high plant output rate.

Of course, the invention is susceptible to various modifications and adaptations without departing from the pureview of the inventive concept.

Furthermore, any materials, dimensions and contingent shapes may be used according to necessity.

CLAIMS

1. A method of manufacturing footwear, characterized in that it comprises the following steps:

a) pre-forming footwear elements;

b) applying to said footwear elements, where necessary, a bonding substance of the type which is subsequently activable to assume curable, adhesive properties;

c) assembling of said footwear elements;

d) activation and subsequent curing of said bonding substance previously applied to said footwear elements.

2. A method according to claim 1, characterized in that said footwear elements comprise at least a liner consisting of a soft inner shoe, an anatomical insole incorporating a toe piece and buttress, an upper and a sole, over all of said footwear elements there being applied, where necessary, successively activable bonding substances.

3. A method according to claim 1, characterized in that during said step of assembling said footwear elements, a liner is mounted on an internal supporting means, thereafter, an insole is mounted on said liner.

4. A method according to claim 3, characterized in that during said step of assembling said footwear elements, a preformed upper defining a bottom portion is mounted on said insole, and then a sole mounted on the bottom portion of said upper, successively carrying out, an operation of activating and curing bonding substances.

5. A method according to claim 2, characterized in that said sole is preformed with a raised outer edge.

6. A method according to claim 4, characterized in that the assembled footwear article, is treated with means for activating the bonding substance and mechanically held assembled until the glues have thoroughly cured.

7. Any item of footwear obtained by the method of manufacturing footwear according to the invention, as claimed in the preceding claims.

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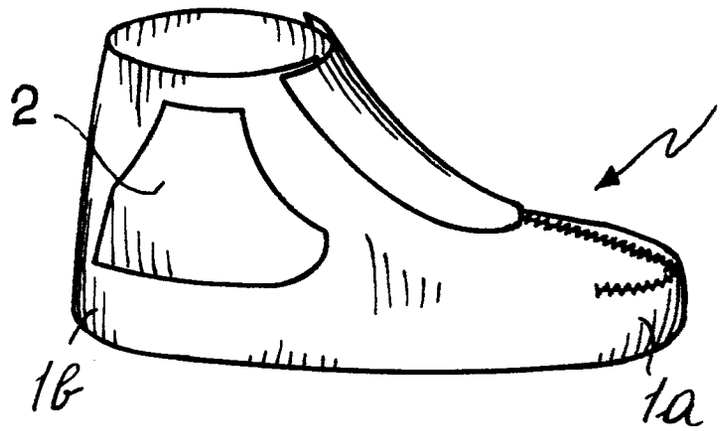

Fig. 1

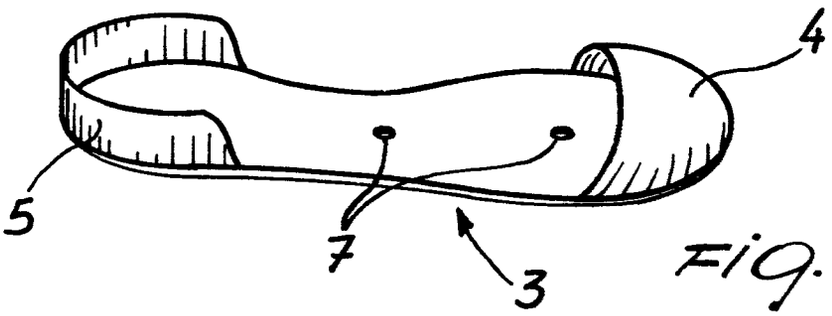

Fig. 2

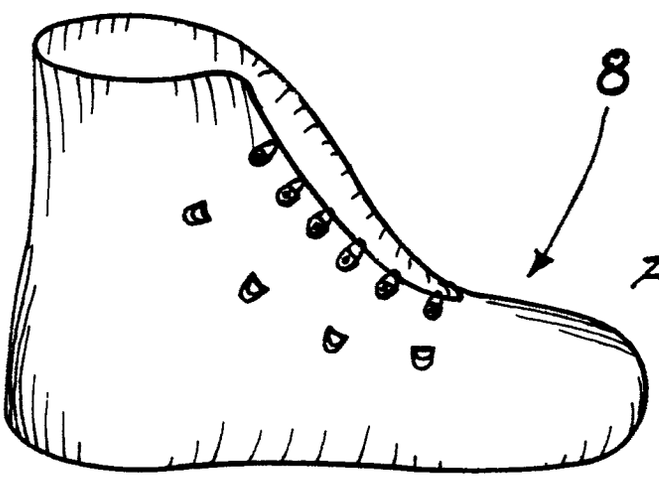

Fig. 3

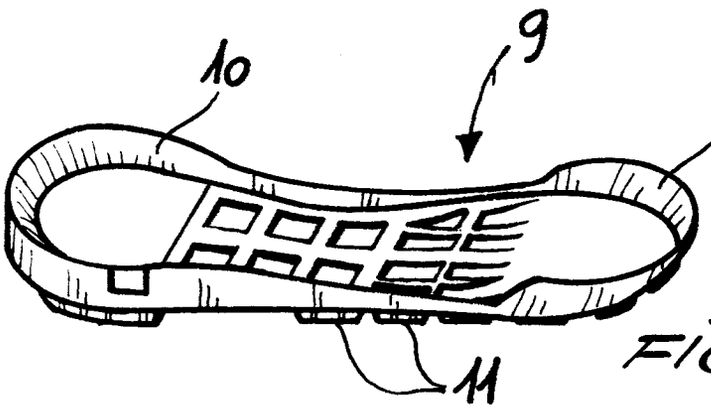

Fig. 4

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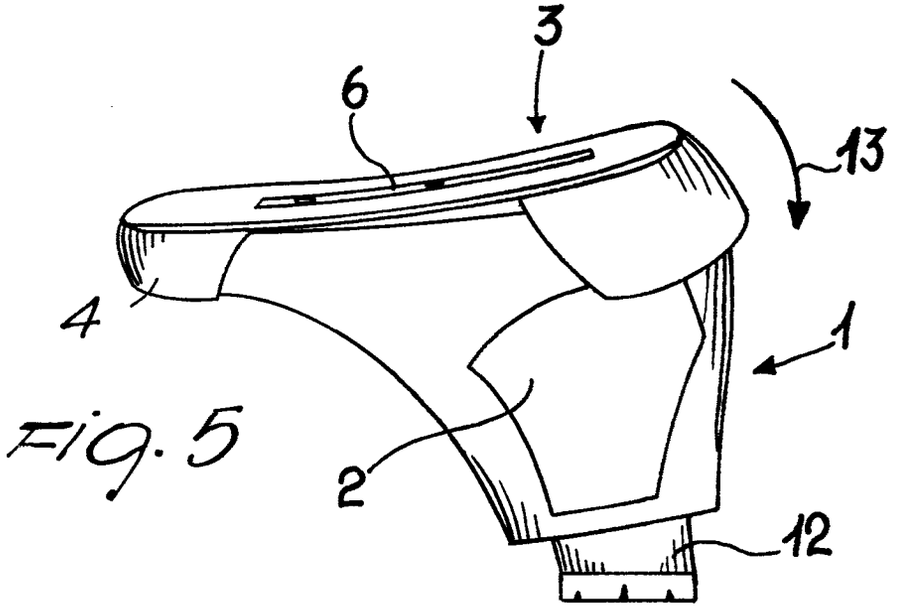

Fig. 5

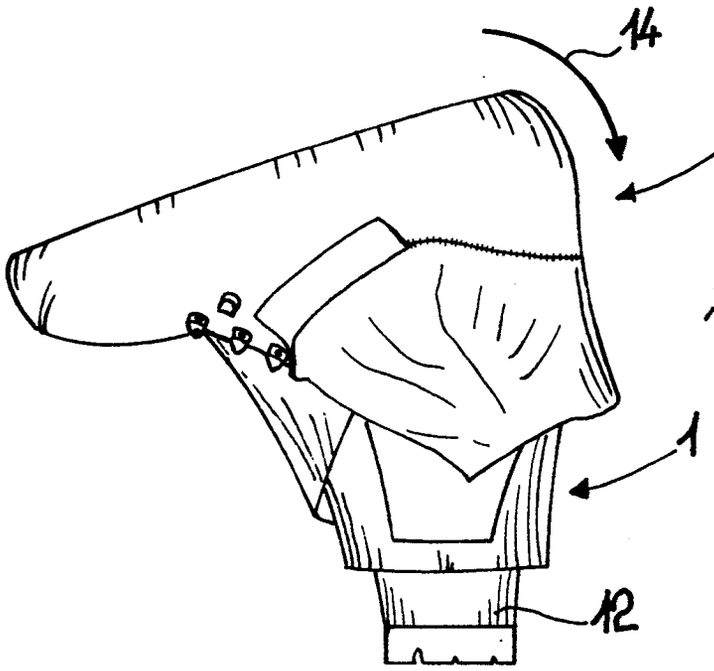

Fig. 6

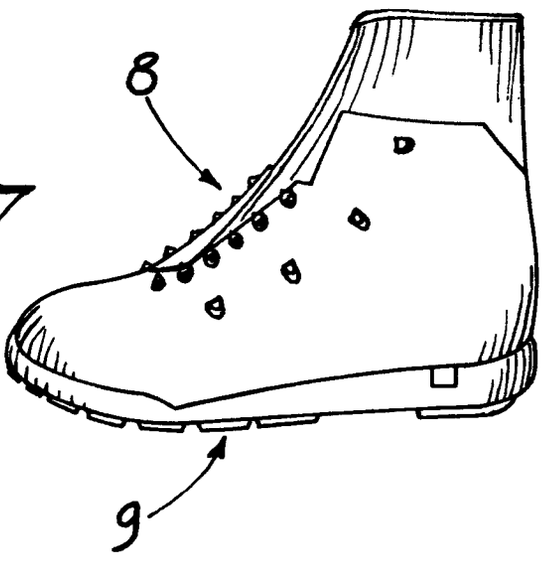

Fig. 7