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Method for manufacturing shoes with a fabric upper part

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For the production of lightweight shoes, fabrics are usually used that are designed as multi-layered thick fabrics.

Individual parts of such shoes, such as the toecaps and heel caps, have already been reinforced by gluing fabric webs together. If such stiffeners were also provided with air openings through punched-out areas, this was often not sufficient, however, so that foot injuries due to pressure and chafing occurred. Seamless knitted socks have also been produced or knitted as sock or shoe parts one after the other, e.g., on tape looms, which have a uniform fabric structure or stitch formation.

Reinforced fabrics have also been produced at individual points, as well as fabrics that are designed as double fabrics at certain points, wherein the reinforcement was achieved by chemically treated textile threads, double thread guidance, for example to form patterns or the like.

According to the invention, lightweight shoes, in particular sports shoes, are produced in that the upper part of the shoe consists of a fabric which is obtained in a continuous sequence from fabric strips of various configurations. These fabric strips correspond in their design to the properties of strength, stiffness, elasticity etc. desired for the finished shoe in all its parts.

The desired fabric properties for the

various contiguous fabric strips can be achieved by forming the fabric web in several layers at specific points. Hard or hardenable threads can also be inserted at certain points in the fabric, the position, number and thickness of which depend on the desired properties of the shoe part in question. Particularly for the caps, certain parts of the continuous fabric can also be formed as a hollow fabric, or the upper and lower layers of the fabric can remain unconnected at certain points, for example. Stiffening materials are then inserted into the resulting cavities, which give the toe cap or rear cap the desired strength without the risk of pressure points or injuries caused by chafing.

The fabric, the blanks, or even the finished shoe can be subjected to post-treatment at certain points to achieve stiffening, depending on the textile material used or the special properties of the reinforcements. The post-treatment can be chemical or, for example, by pressure or heat. Impregnation, sealing, or other changes to the texture of the fabric can be achieved at the same time through post-treatment.

The individual shoe blanks are cut out of the corresponding woven panels, wherein the position of the individual connected fabric strips to be woven together is already taken into account during fabric production

with regard to the arrangement of the shoe blanks.

The advantage of this manufacturing method is that a correspondingly large number of identical shoe blanks can be produced over the entire width of a fabric. The arrangement of the individual shoe blanks enables good utilization of the fabric with minimal waste. The shoe blanks are completely ready for attaching the sole, and only one seam is required on the toe cap. Shoes of any size can be produced by selecting the appropriate thread arrangement, and patterns, identification marks etc. for the individual shoes can be printed or otherwise applied to the finished fabric.

The drawing shows an embodiment example of the object of the invention, in which the individual shoe blanks are arranged in a particularly practical manner on a continuous web of fabric.

Fig. 1 shows a schematic cross-section through the fabric web shown in

Fig. 2 in a view from above, on which the position of the individual shoe blanks is indicated.

Fig. 3 shows part of the cross-section according to Fig. 1 with an example of the formation of the individual contiguous and interwoven fabric strips.

Fig. 4 shows a finished shoe.

The fabric web 1 is a continuous fabric but consists of differently bonded and equipped strips I, II, and III. These strips are conveniently arranged in such a way that a continuous shoe upper part can be cut from them, i.e., consisting of one piece, in which the strips I, II, and III then lie at the points where, according to their various designs, the desired properties can appear on the finished shoe.

In the embodiment example shown, the arrangement is such that the shoe upper parts 2, 3, 4, and 5 with their cap part are positioned next to each other in such a way that the fabric web 1 is utilized as efficiently as possible.

Here, the fabric strip I is designed as a hollow fabric, as it is used to produce the rear cap. In order to stiffen the rear cap,

stiffening material can be inserted or woven into the cavity 6 between the upper and lower fabric layers 7 and 8.

The fabric strip I merges into strip II, which in the embodiment example shown is intended to form the blade and the side parts of the shoe. Accordingly, the fabric of strip II is elastic and multi-layered. The fabric strip II merges into the fabric strip III, which in this case is designed to form the front cap. In the embodiment example shown, the shoe upper parts 2, 3, 4, and 5 are placed together with their toe part in such a way that the entire width of strip III can be used to produce the toe caps.

Strip III then merges back into strip II, which is followed by fabric strip I without interruption and with the corresponding formation.

In this way, two strips I, two strips II, and one strip III form a fabric repeat A. Half a repeat = $\frac{1}{2}$ A (Fig. 3) is therefore required to make a shoe. As many repeats A can be produced side by side at the same time as the width of the loom used permits.

The individual fabric layers of a multi-layer fabric can be joined in any way; however, as can be seen in Fig. 3, this is usually done during the weaving process itself.

In this fabric, layer 7 represents the perfectly even and smooth surface of the fabric 1 or the finished shoe. To stiffen the fabric strip III or the layer 8 of the fabric strip I, stiffening threads 9 are inserted into the fabric, which should be sufficient for stiffening the rear cap in most cases, for example. These stiffening threads are either made of hard material, such as the so-called Sirius threads. They can also be impregnated with cellulose and subsequently hardened. If stiffening of this strip is required, stiffening threads can also be inserted into strip II.

If the stiffening threads consist of subsequently hardenable materials, these can be introduced into the fabric in such large numbers that during hardening, which can be carried out both in the fabric and in the finished shoe, the textile threads lying next to the stiffening threads are also

impregnated and thus also stiffened, so that a dense, continuous layer of fabric is created. Only certain threads of the shoe fabric can be made of hard yarn, for example, or can be subsequently hardened. In this way, all parts of the shoe can be produced with the desired stiffness.

The shoe soles 10 (Fig. 4) are attached according to the known methods, and lacing holes 11, eyelets etc. are also attached to the shoes in the known manner. In the embodiment example shown, the individual shoe upper parts are sewn together at the toe cap.

The distribution of the individual blanks 2 through 5 on the fabric web 1 depends on the size of the shoes to be produced, which is already taken into account during the construction of the fabric. Accordingly, the pattern imprint for the shoes can be made in the entire piece, just as it is also possible to provide corresponding cap or side parts with punched decorative openings at the same time as punching.

In addition to sports shoes, other items of footwear, such as sandals, gaiters, overshoes, etc., in which certain areas are to be stiffened, can also be produced in the manner described. Fig. 4 shows the arrangement of fabric strips I, II, and III.

PATENT CLAIMS:

1. Method of manufacturing shoes

with a fabric upper part, characterized in that the shoe upper cap is made of a fabric which consists, in continuous order, of contiguously produced fabric strips suitable in thickness and stiffness for forming the toe cap, the vamp, the side parts and the heel cap.

2. Method according to claim 1, characterized in that the strength and stiffness desired for the manufacture of the various contiguously produced fabric strips is achieved by multilayer formation of the fabric.

3. Method according to claims 1 and 2, characterized in that hard or hardenable stiffening threads are introduced into the continuous fabric at certain points.

4. Method according to claim 1 through 3, characterized in that the continuous fabric is formed as a hollow fabric, for example in the parts intended for forming the caps.

5. Method according to claims 1 through 4, characterized in that certain parts of the fabric or the finished shoe are subjected to a post-treatment for stiffening which corresponds to the material or the type of stiffening threads, the desired stiffness of the fabric, the material of inserted inserts or the like.

For this, 1 sheet of drawings

