June 8, 1971 HIDEO HAYASHI 3,583,081

UPPER MATERIAL FOR SHOES

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FIG. 1

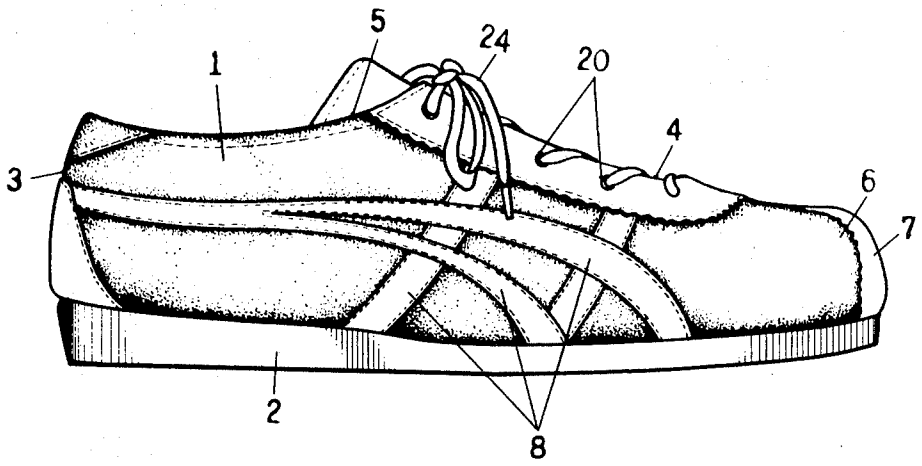


FIG. 2

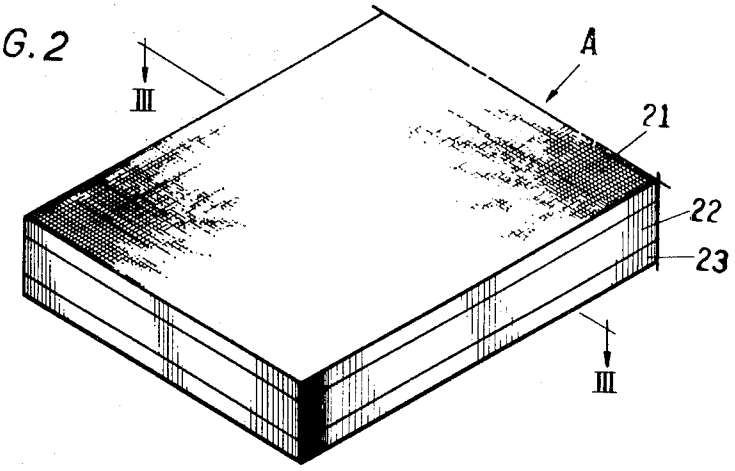
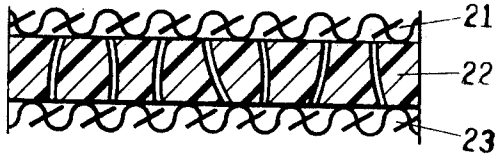


FIG. 3



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FIG. 4

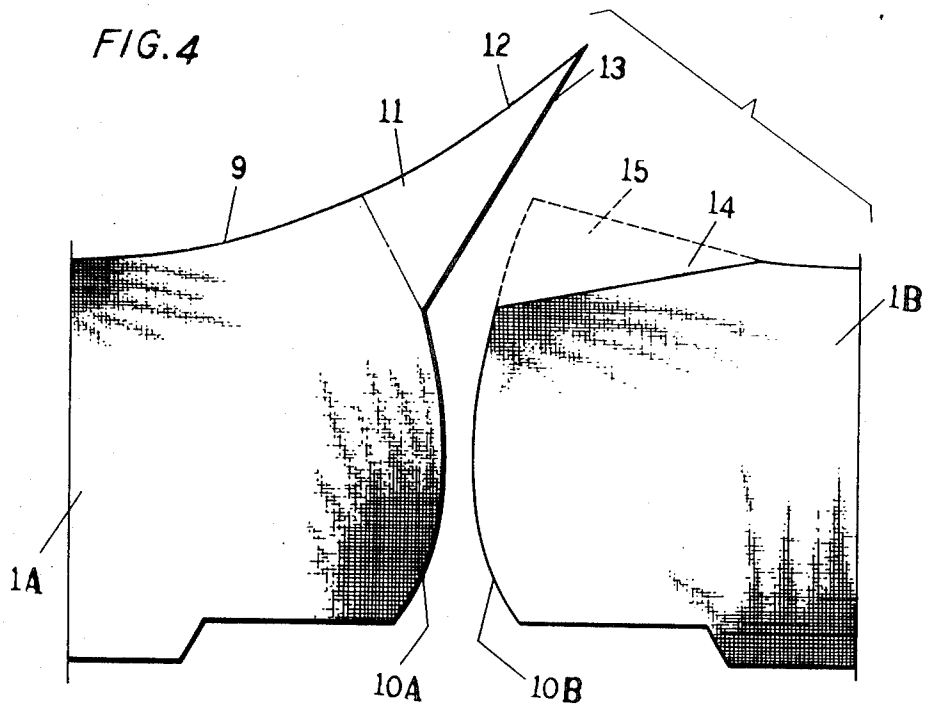
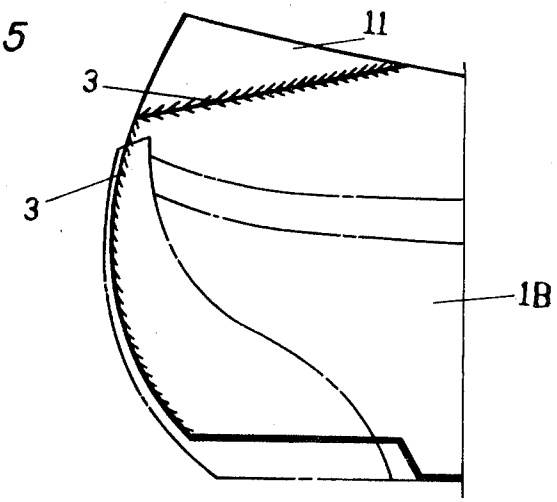


FIG. 5



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3,583,081

UPPER MATERIAL FOR SHOES

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Continuation-in-part of application Ser. No. 682,214, Nov. 13, 1967. This application Feb. 11, 1969, Ser. No. 798,297

Claims priority, application Japan, Aug. 29, 1967, 42/73,868

Int. Cl. A43b 23/02

U.S. Cl. 36—45 3 Claims

ABSTRACT OF THE DISCLOSURE

An athletic shoe comprises an upper and sole. Said upper is formed of two upper halves, and both rear edges of the upper halves are sewn together at the rear seam-line the upper in such a manner that the upper portion of the seam-line is adapted for getting out of the rear center position of the shoe. The material of said upper comprises an outer layer, an intermediate layer and an inner layer Said outer layer is woven or knit of synthetic or natural fiber and provided with high abrasion-resistance. Said intermediate layer is made of a resilient porous resin or rubber material. Said inner layer is woven or knit of synthetic or natural fiber having higher elasticity as compared with said outer layer.

RELATED APPLICATIONS

This application is a continuation-in-part of copending application Ser. No. 682,214, filed Nov. 13, 1967 now abandoned, and claiming priority based on Japanese patent application No. 73,868/67, filed Aug. 29, 1967.

The present invention relates to improvements of athletic shoes, more particularly to improvements of upper of the shoes.

The main object of the present invention is to provide an athletic shoe being comfortable to wear for taking suitable exercises.

The other important object of the present invention is to provide an upper material having high physical strength with respect to elasticity and to tensile strength and qualities to effectively retain the shape after being made into a shoe, and yet being provided with resiliency to softly wrap around the instep as well as with suitable ventilating qualities to thereby obtain shoes suitable for taking exercises and comfortable to wear.

Further described in detail, the object of the present invention is to provide a novel three-layered upper material having high abrasion resistance, high physical strength with respect to elasticity and to tensile strength, and comprising an outer layer woven or knit of synthetic fiber, an intermediate layer made of resilient porous resin or rubber having pores therein and an inner layer woven or knit of synthetic fiber which has lower tensile strength but relatively higher elasticity than said outer layer; shoes comfortable to wear as referred to above are thereby to be obtained.

Other objects and advantages will become apparent from the following detailed description with reference to the accompanying drawings, in which:

FIG. 1 is a side view of the athletic shoe according to the present invention;

FIG. 2 is an enlarged perspective view showing a portion of the upper material in accordance with the present invention;

FIG. 3 is an enlarged cross-sectional view taken along the line III—III in FIG. 2;

FIG. 4 is a plan view of partial upper halves of the upper stamped from the sheet material; and

FIG. 5 is an enlarged side view of the rear portion of the shoe according to the present invention.

As shown in FIG. 1, the athletic shoe includes an upper 1 and sole 2. Said upper 1 and sole 2 may be secured together in any conventional manner, that is, they may be stitched or cemented together with and, if necessary, may be secured together with by means of any combination of these methods. Said upper is made of two upper halves 1A and 1B as shown in FIG. 4 and rear edges 10A and 10B thereof are sewn together at a rear seam-line 3 (FIG. 1).

A front opening 4 with shoe lace 24 extends top line 5 of the upper up to toe region 6 which is covered by a toe cap 7 for reinforcing thereof. A plurality of reinforcing strip members 8 are integrally secured throughout their length to both sides of the upper for strengthening and ornamenting sides of the upper.

As shown in FIG. 4, said rear edges 10A and 10B of the upper halves are formed in such curvature that as the upper halves are sewn up together with at the rear edges, the rear portion of the upper is curved in a shape to be capable of providing comfortable to wear.

The upper half 1A is provided with a triangular tongue 11, integrally extending from the upper portion of the rear edge 10A, and having a lower sewing edge 13 and a top curved edge 12 which is, in curvature thereof, equivalent to a rear top edge 9 of the upper half 1A. At rear top section thereof the upper half 1B is cut off the area corresponding to the tongue 11 from its original profile as shown in dotted line in FIG. 4, whereby when both upper halves 1A and 1B are stitched together with along the rear seam-line 3 formed by the rear edges 10A and 10B, the lower sewing edge 13 and an upper sewing edge 14, said tongue 11 is adapted to compensate for cutting off section 15 of the upper half 1B, and said upper portion of the rear seam-line 3 adapted for getting out of the rear center position of the shoe. Thus, foot closely inserted in the shoe will never be in contact with the slightly protruded portions which are formed at said rear seam-line 3 by sewing threads, thereby providing comfortable to wear for taking exercises.

The upper material A of the upper 1 comprises an outer layer 21 woven or knit of synthetic or natural fiber, e.g. cotton fabrics, polyvinylchloride fiber, polyamide fiber or the like, such as a polyamide resin, polyester resin or the like which has high abrasion resistance and provided with higher physical strength than the below described inner layer 23, an intermediate layer 22 formed of resilient porous synthetic resin rubber or natural rubber, e.g. poly-urethan-foam resin or rubber, having pores therein and an inner layer 23 woven or knit of synthetic fiber, e.g. cotton fabrics, polyvinylchloride fiber, polyamide fiber or the like, having lower tensile strength than said outer layer but relatively high elasticity. Heated at a definite high temperature as used conventionally, said intermediate layer 22 is fused so as to adhere to both layers 21 and 23 by a pressing unit not through adhesive, thereby that said layers 21, 22 and 23 are integrally and inseparably fused to each other.

It will be readily understood that the athletic shoe B constructed of the upper material A as above described has the following advantages. Since the outer layer 2 of the upper material is provided with higher physical strength than the inner layer 23, and as between the outer layer 21 and inner layer 23 is interposed the intermediate layer 22 formed of a resilient porous resin or rubber, said outer layer 21 enables the shoe to effectively retain its shape once it has been constructed, while the resiliency of said intermediate layer 22 exerted more efficiently towards the inside makes the shoe remarkably comfortable to wear. In addition, said elastic intermediate layer 22

further absorbs shocks and other forces exerted from the outside thereby preventing such impact from being directly delivered to the foot beneath the upper, the force to be directed to the outer layer **21** from the inside, on the other hand, being also absorbed by said intermediate layer **22**; the durability of the outer layer **21** can be thus increased.

By the provision of said outer layer **21**, the damage and wear of the upper material A are also eliminated. Further when the shoe is tightly applied on the foot by fastening the shoe lace **24** through eyelets **20**, said outer layer **21** prevents the upper from stretching in response to the tensile force of said shoe lace, so that said shoe lace can fully produce the fastening effect. Because of the upper material A comprises three layers, a suitable thickness is consequently provided to said upper material, and for this reason, the fastening force exerted by said shoe lace is to be delivered to the entire area of the upper. Therefore, fastening effect can be satisfactorily achieved even by a small force while, with the pressure created by said fastening force being absorbed by said three-layered structure, uncomfortable application of the shoe to the instep is avoided.

Furthermore, since the inner layer **23** forming said upper material A is made of a fabric woven or knit of synthetic fiber having relatively high elasticity, said inner layer, together with the intermediate layer **22** made of a resilient material, wraps around the foot with a soft feel to the touch and a snug fit thereon with external force being eliminated thereon, whereby wearing comfort is provided.

In the upper material A in accordance with the present invention, the outer layer **21** and the inner layer **23**, respectively covering the front and back sides of the intermediate layer **22** made of a porous synthetic resin or rubber and the like, are woven or knit of synthetic fiber. Accordingly, the ventilating apertures provided by the meshes therein and the pores **11** in said intermediate layer are intercommunicated, and ventilation is thereby maintained. When in use, in particular, breathing effected in response to the stretch and compression of said intermediate layer facilitate ventilation, effecting efficient exhalation of perspiration and adding to wearing comfort, whereby an athletic shoe applicable without undue fatigue

can be provided; another remarkable feature of the present invention.

While the present invention has been described as above concerning typical embodiments, the inventor does not wish to limit the invention only to the embodiments, but the invention may also reside in all of the substitutes, modifications and equivalents without departing from the spirit of the inventor and the claims as set forth below.

What I claim is:

1. An athletic shoe having a sole, an upper secured to the sole, and a plurality of elongated reinforcing strips integrally secured throughout their length to sides of the upper for strengthening the sides of the upper, said upper being formed of two upper halves whose rear edges are stitched at a rear seam line, one of the upper halves including a tongue portion extending laterally of the rear center line of the shoe and being received by a complementary notch portion provided in the other of the upper halves, each of the upper halves comprising an outer layer, an intermediate layer, and an inner layer, the intermediate layer being formed of resilient foam material, the outer and inner layers being formed of woven synthetic fiber, the synthetic fiber of the outer layer having higher abrasion resistance and greater tensile strength than the synthetic fiber of the inner layer, the inner layer having greater elasticity than the outer layer, the outer, intermediate and inner layers being fused together.

2. The shoe of claim **1** in which the material of the outer layer si selected from polyvinylchloride and polyamide.

3. The shoe of claim **1** in which the material of the inner layer is selected from polyvinylchloride and polyamide.

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