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(54) **SHOE ATTACHMENT DEVICE**

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(57) **ABSTRACT**

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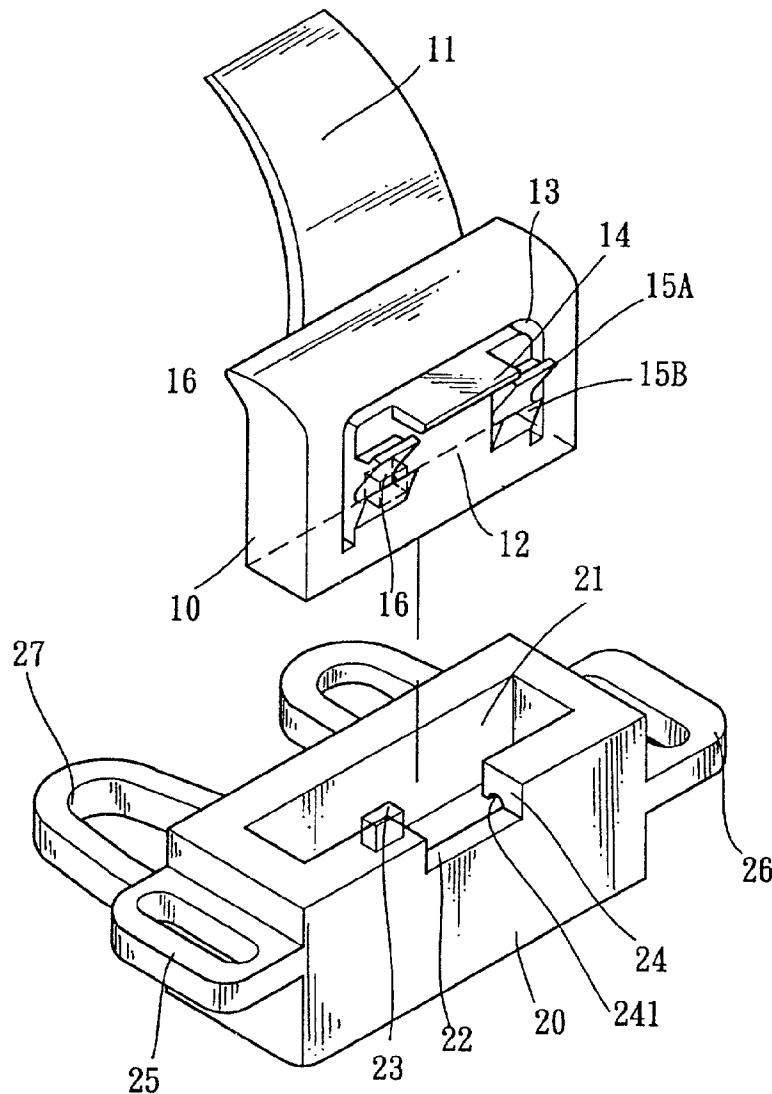
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A shoe attachment device comprises an attachment element and an attachment base. The attachment element is connected to a vamp or a heel strap. The attachment base is embedded in the sole, and includes an insertion slot into which the attachment element inserts to attach the vamp or the heel strap to the sole. The insertion slot includes an inner blocking member onto which an arcuate groove is defined. The engagement tooth engages the arcuate groove to attach the attachment element to the attachment base. A guiding lip is further formed in the insertion slot to engage a corresponding stop slot.



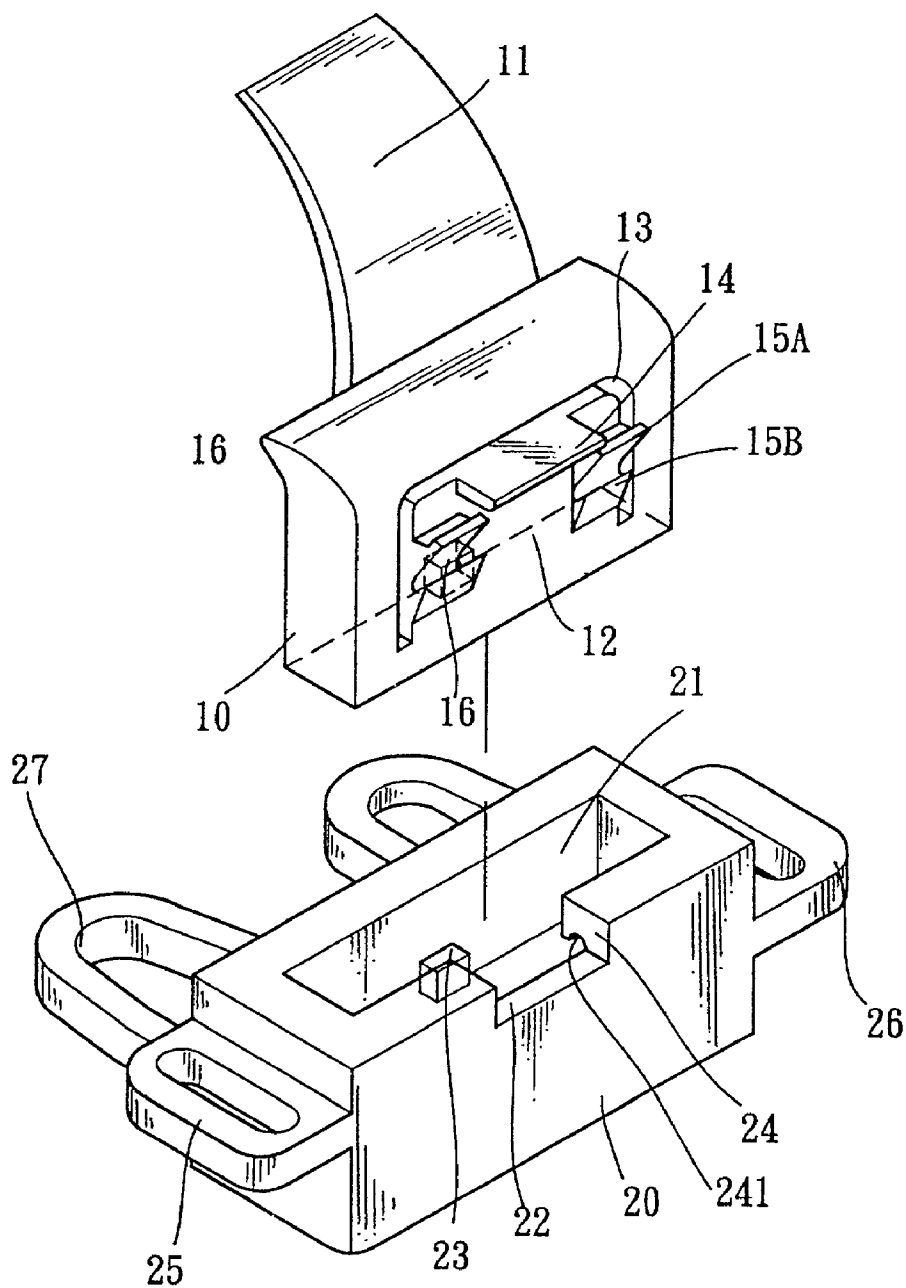


Fig. 1

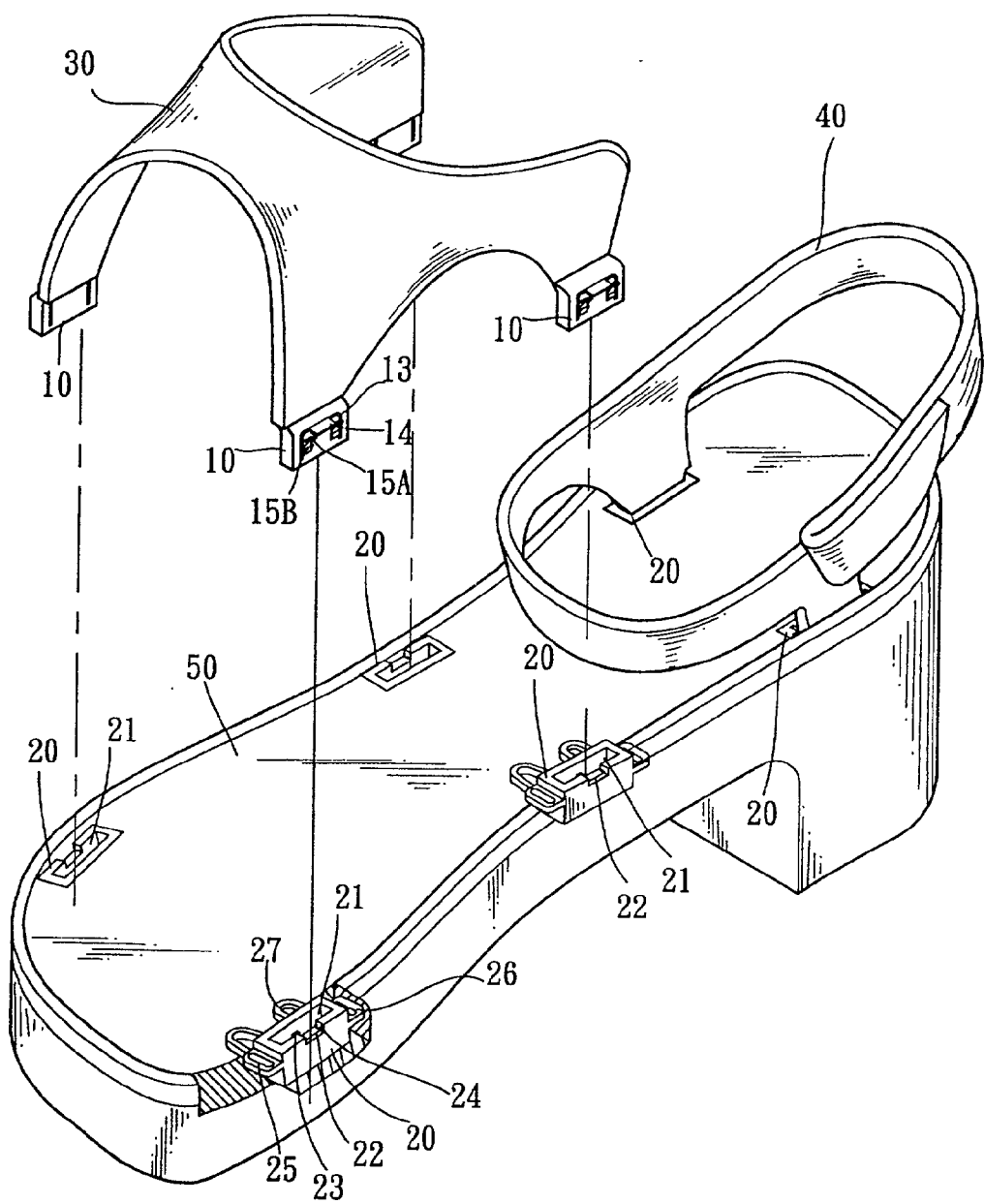


Fig.2

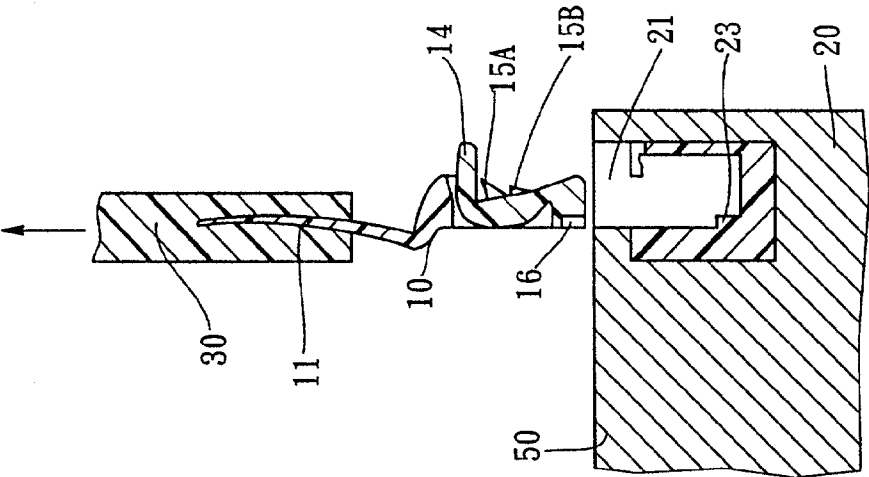


Fig. 3C

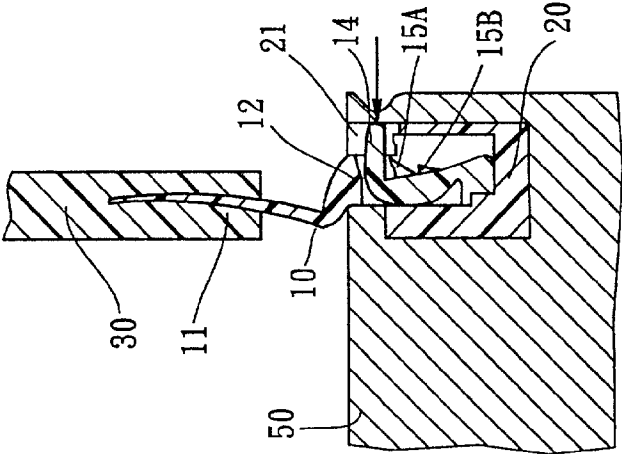


Fig. 3B

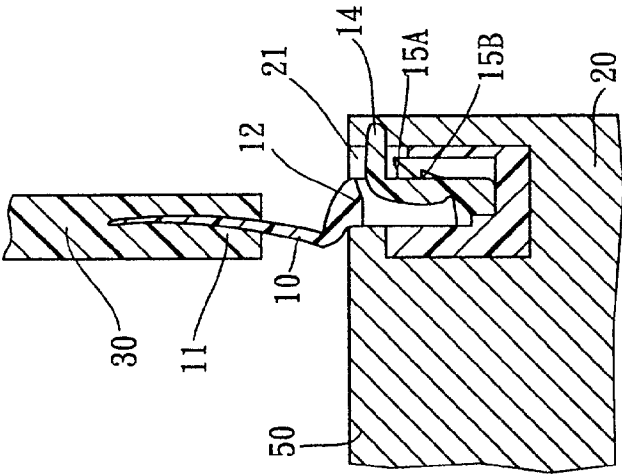


Fig. 3A

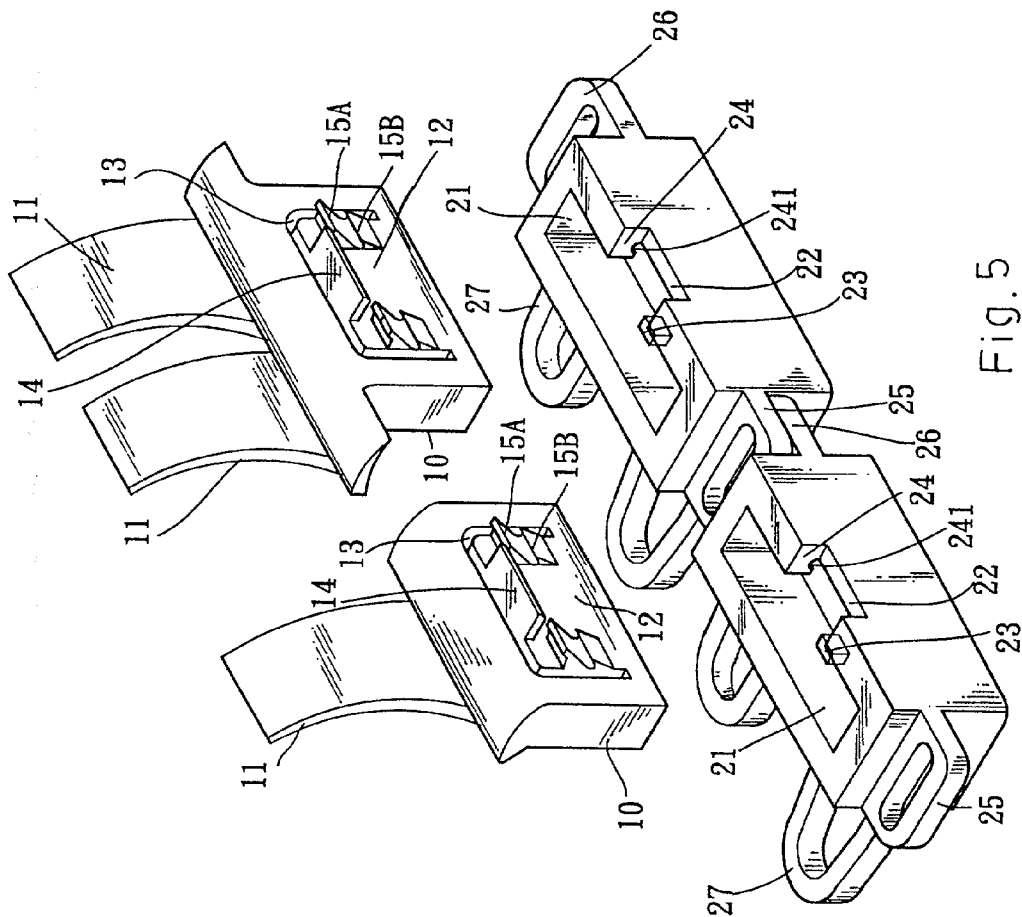


Fig. 5

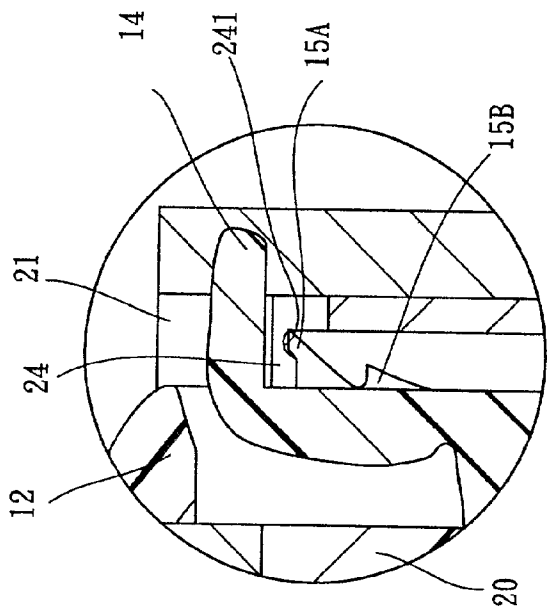


Fig. 4

SHOE ATTACHMENT DEVICE

FIELD OF THE INVENTION

[0001] The invention relates to a shoe attachment device. More particularly, the invention provides a shoe attachment device that allows a user to desirably and securely change and attach a vamp or heel strap onto the shoe sole as desired.

BACKGROUND OF THE INVENTION

[0002] Traditional slippers have vamp elements that are permanently and irreversibly attached to the sole. With respect to sandal type shoes, their heel straps are also permanently and irreversibly attached onto the sole. Once the slipper or sandals are purchased, if any of the different parts of one shoe is damaged, the entire pair of shoes must be usually thrown away. Some commercially available slippers or sandals may be also provided with attachment devices that allow mounting and dismounting of the vamps and heel straps. However, the connection achieved by those attachment devices is usually exposed outwardly, which adversely affects the aesthetic aspect of the shoe. Moreover, those traditional attachment devices do not allow the user to desirably and flexibly change the type of vamps or heel straps.

SUMMARY OF THE INVENTION

[0003] It is therefore an object of the invention to provide a shoe attachment device that can overcome the above disadvantage by allowing a user to flexibly and securely attach various types of vamps or heel straps to a shoe sole.

[0004] To accomplish the above and other objectives, a shoe attachment device of the invention comprises an attachment element and an attachment base. The attachment element is connected to the vamp or the heel strap, and includes an insertion tongue on which an engagement tooth is formed. The attachment base is embedded in the sole, and includes an insertion slot into which the attachment element inserts to attach the vamp or the heel strap to the sole. The insertion slot includes an inner blocking member onto which an arcuate groove is defined. The engagement tooth engages the arcuate groove to attach the attachment element to the attachment base. A guiding lip is further formed in the insertion slot to engage a corresponding stop slot defined into the insertion tongue.

[0005] With the above structure, the attachment device allows a user to rapidly and securely attach the vamp and/or the heel strap onto the sole. Furthermore, by forming attachment ears on the sides of the attachment base, various attachment bases can be placed contiguously to one another to allow various types of vamps to be desirably mounted onto the sole.

[0006] To provide a further understanding of the invention, the following detailed description illustrates embodiments and examples of the invention, this detailed description being provided only for illustration of the invention.

BRIEF DESCRIPTION OF THE DRAWINGS

[0007] The drawings included herein provide a further understanding of the invention. A brief introduction of the drawings is as follows:

[0008] FIG. 1 is general perspective and exploded view of a shoe attachment device according to an embodiment of the invention;

[0009] FIG. 2 is a perspective and enlarged view of a shoe attachment device according to an embodiment of the invention;

[0010] FIG. 3A through FIG. 3C are section views illustrating an operation of the shoe attachment device according to an embodiment of the invention;

[0011] FIG. 4 is a locally enlarged view of FIG. 3A; and

[0012] FIG. 5 is a perspective view illustrating another example of implementation of the shoe attachment device of the invention.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0013] Wherever possible in the following description, like reference numerals will refer to like elements and parts unless otherwise illustrated.

[0014] Referring to FIG. 1 and FIG. 2, an attachment device according to an embodiment of the invention comprises an attachment element 10 and an attachment base 20. A top of the attachment element 10 is connected to a connecting portion 11 that fastens the attachment element 10 with a shoe vamp 30 or a shoe heel strap 40. An insertion tongue 12, flexibly pushable, is defined from the attachment element 10 via a U-shaped groove 13 formed in the attachment element 10. The U-shaped groove 13 penetrates into the attachment element 10 in a manner to substantially separate the insertion tongue 12 from the attachment element 10 so that the insertion tongue 12 is capable of inwardly deviating under pushing action thereon. The insertion tongue 12 outwardly includes a pushing projection 14 for hand pushing. An external sidewall of the insertion tongue 12 further includes two rows of first and second engagement teeth 15A, 15B that are vertically protruded. Each first engagement tooth 15 terminates into a top portion that is a substantially horizontal face. A stop slot 16 is further defined in an inward sidewall of the insertion tongue 12.

[0015] The attachment base 20 can be formed by, for example, foam forming in a manner to be embedded into the shoe sole 50. An insertion slot 21 is defined through the attachment base 20. The insertion slot 21 is upwardly exposed through the upper surface of the sole 50 to receive the insertion tongue 12 connected to either the vamp 30 or heel strap 40. A notch 22 is defined through a sidewall of the insertion slot 21 to expose the push projection 14 when the insertion tongue 12 is inserted in the insertion slot 21. Two inner faces of the notch 22 inwardly extend to respectively form a blocking member 24. An arcuate groove 241, downwardly oriented, is further defined in a lower face of each blocking member 24. A guiding lip 23 is further formed within the insertion slot 21 to engage with the stop slot 16 of the insertion tongue 12. Left and right attachment ears 25, 26, with respective different height, are respectively attached to left and right sides of the attachment base 20 to increase its attachment into the sole 50, the left attachment ear 25 being higher one thickness of the right attachment ear 26. A rear side of the attachment base 20 extends into a mounting portion 27 that attaches and anchors the attachment base 20 into the sole 50. The location of the mounting portion 27

vis-à-vis the attachment base 20 may be, according to the manner the assembly of the attachment base 20 into the sole 50 is achieved, at the front or rear side thereof, for example.

[0016] Referring now to FIG. 3A through FIG. 3C, if the vamp 30 or heel strap 40 are to be changed, the user, via one hand, pushes on a side surface of the sole 50. Because the sole 50 is typically foam formed and consequently has a certain flexibility, the pressure is transferred onto the push projection 14. As a result, the push projection 14 and the insertion tongue 12 inwardly deviate until the first engagement teeth 15A disengage from the arcuate grooves 241 of the blocking members 24. The attachment element 10 is thereby removed from the attachment base 20, and the vamp 30 or heel strap 40 can be desirably changed. The shoe can be thus desirably changed into sandal-type shoe or slipper-type shoe.

[0017] With the guiding lip 23 engaging the stop slot 16, the attachment element 10 is properly guided meanwhile being inserted into the attachment base 20. Furthermore, when an external torque is exerted on the vamp 30 or heel strap 40, the first engagement teeth 15A may adversely tend to disengage from the arcuate grooves 241. The engagement of the guiding lip 23 with the stop slot 16 reinforces the attachment of the attachment element 10 into the attachment base 20, and can thereby effectively prevents accidental separations of the vamp 30 or heel strap 40 from the sole 50.

[0018] As shown in FIG. 4, the top portion of each first engagement tooth 15A is a substantially planar face. When the attachment element 10 inserts into the attachment base 20, the first engagement teeth 15A are flexibly pressed and guided through the insertion slot 21 until the top portions of the first engagement teeth 15A flexibly engage the arcuate grooves 241 to achieve the attachment. The curvature of the arcuate grooves 241 is such that once the planar top portions of the first engagement teeth 15A are flexibly pressed therein, gaps are left there between. The engagement and disengagement between the attachment element 10 and the attachment base 20 is thereby facilitated. The disengagement is achieved via a simple hand pressure on the pushing projection 14 to disengage the top portions of the first engagement teeth 15A from the arcuate grooves 241. Through such a design of the blocking members 24 and the arcuate grooves 241, the user thus can rapidly mount and dismount the vamp 30 or heel strap 40.

[0019] When an excessive torque is exerted on the vamp 30 or heel strap 40, the first engagement teeth 15A may disengage from the arcuate grooves 241 of the blocking members 24 due to a too important stress. However, via a reciprocal resilient deformation of the insertion tongue 12, the second engagement teeth 15B then in turn about the arcuate grooves 241 to ensure the attachment of the attachment element 10 into the attachment base 20. The attachment device of the invention is thereby greatly secured.

[0020] Furthermore, the attachment element 10 of the invention does not tightly engage with the attachment base 20. When a foot fits into the shoe, it may force the vamp 30 to upwardly extend, which causes the first engagement teeth 15A to be pulled upward as tightly as possible against the arcuate grooves 241. Because a gap is left between each top portion of first engagement teeth 15A and the vis-à-vis

arcuate groove 241, the resulting slide clearance therefore allows the top portion of each first engagement tooth 15A to further tightly abut against the corresponding arcuate groove 241. As a result, a better attachment of the vamp 30 and heel strap 40 to the sole 50 can be achieved.

[0021] Referring to FIG. 5, as the ears 25, 26 on the sides of the attachment base 20 are differently leveled, two attachment bases 20 can be thus contiguously arranged with one left ear 25 placed above another neighboring right ear 26. Either a single or a plurality of vamps 30 hence can be arranged across the sole 50 via attaching a plurality of attachment elements 10 into a plurality of attachment bases 20 along the peripheral sides of the sole 50.

[0022] As described above, the attachment device of the invention can therefore achieve a secure and flexible attachment of shoe vamps and heel straps onto the shoe sole. The vamps and heel straps are securely and easily attached onto or detached from the sole via attachment elements that insert and engage into attachment bases embedded into the sole. Via a specific structure of the attachment elements and the corresponding attachment bases, the attachment device of the invention allows a secure and flexible attachment even when torque stress are exerted on the different parts of the shoe. By arranging the attachment bases according to different manners into the sole, for example spaced apart from one another or contiguously placed, the attachment of vamps can be desirably accomplished according to different manners.

[0023] It should be apparent to those skilled in the art that the above description is only illustrative of specific embodiments and examples of the invention. The invention should therefore cover various modifications and variations made to the herein-described structure and operations of the invention, provided they fall within the scope of the invention as defined in the following appended claims.

What is claimed is:

1. A shoe attachment device, mounted onto a shoe having at least a sole, a vamp, and a heel strap, the attachment device comprising:

an attachment element connected to the vamp or the heel strap, including at least an insertion tongue on which at least an engagement tooth is formed; and

an attachment base embedded into the sole, including an insertion slot into which the attachment element inserts to attach the vamp or the heel strap, the insertion slot including an inner blocking member onto which an arcuate groove is defined, thereby the engagement tooth engages the arcuate groove to attach the attachment element to the attachment base, wherein a gap is left between a top portion of the engagement tooth and the arcuate groove once the engagement tooth is engaged with the arcuate groove.

2. The shoe attachment device of claim 1, wherein a plurality of attachment ears are respectively formed on a left side and a right side of the attachment base.

3. The shoe attachment device of claim 1, wherein a guiding lip is further placed within the insertion slot to engage with a stop slot defined on the insertion tongue.

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