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(54) **Strengthening plate for footwear**

Verstärkungsplatte für Schuhwerk

Plaque de renfort pour article chaussant

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Description

[0001] The present invention relates to the technical field concerning footwear production, with particular reference to the production of strengthening plates for footwear reinforcement.

[0002] In order to give the footwear a greater value, strengthening plates are firmly associated with the heel insole and can give stronger resistance and high elasticity to this part of the shoe which supports the loading action performed by the foot and due to the weight of the body associated thereto

[0003] The strengthening plates, usually metallic, are obtained by preliminary press molding, subsequent cutting and heat hardening treatment by tempering and drawing back.

[0004] Figures 1a, 1b show a strengthening plate obtained according to prior art, including substantially a curved metallic plate 40, with the concavity turned toward the heel insole, to which it will be associated.

[0005] The plate 40 features a fork-like end 41, which is aimed at being engaged by means for fastening the heel to the under-the-foot portion of the shoe

[0006] The strengthening plate features, in its central area, a longitudinal groove 42, which gives it more strength and high resistance to bending.

[0007] Likewise, the prongs (41a,41b) of the fork 41 usually feature additional grooves 42a, extending longitudinally, and increasing the prongs resistance to bending.

[0008] As it has been clearly shown in Figure 1a, two holes (43a,43b) are made at the extremities of the longitudinal groove 42, substantially aligned therewith and situated.

[0009] As shown in Figure 1b, the hole 43b in the area of the strengthening plate fork-like extremity 41, is situated between the groove 42 and the fork 41.

[0010] According to widely known techniques, the strengthening plate can be fastened to the heel insole in two different ways

[0011] According to a first fastening way, additional coupling means are used, such as buttons and/or pins, which are anchored to the heel insole and engage the above mentioned holes 43a, 43b, thus obtaining a mutual snap fastening of the strengthening plate to the heel insole.

[0012] According to a second fastening way, the above mentioned holes 43a, 43b are obtained by punching, so as to define an inner toothed crown, turned toward the heel insole and allowing the mutual fastening of the heel insole and strengthening plate.

[0013] In both techniques of fastening of the strengthening plate to the heel insole, the resistance characteristics of the strengthening plate along a pre-established axial extension D1 of the latter, are proportional to the longitudinal extension D2 of the longitudinal groove 42, and it is limited by the presence of the two fastening holes (43a,43b).

[0014] It is also to be pointed out that the presence of the hole 43b in the area between the fork 41 groove and the relative extremity of the longitudinal groove 42, considerably weakens the strengthening plate, increasing the probability of undesired breaking, which is difficult to foresees

[0015] In order to reduce the possibility of breaking, it is necessary to increase the distance of the hole 43b from the inner part of the fork 41, as well as from the extremity of the groove 42, which results in an undesired reduction of the extension D2 of the groove 42 and in limiting the strengthening plate mechanical characteristics along a pre-established axial extension D1 thereof.

[0016] Document US 1.490.991 describes a longitudinal arch support which is built in with a boot or a shoe. The support has to be positioned first against the insole and then afterwards the outsole is secured in place so that the support will be built into the boot or shoe. The support comprises two plates adapted to extend longitudinally of the boot or shoe. One of the plate is longer than the other plate and the ends of these plates are curved. More in particular, the curves ends of these two plates occupy different planes. The upper flat surfaces of the two plates are provided with pins or spikes which will enter the insole for holding the support against longitudinal and lateral displacement.

[0017] Document US 2.129.588 describes a steel shank stiffener for shoes. The shank consists of a body having integral turned up prongs at its opposite ends. The prongs are relatively soft, that is, while they have sufficient hardness and stiffness to be driven into the material of the innersole by a hammer blow, nevertheless they are not brittle, but are so ductile or flexible that they can be sharply bent without breaking.

[0018] The object of the present invention is to propose a strengthening plate for a shoe, which avoids the above mentioned drawbacks, assuring a particularly stable coupling with the relative heel insole and, at the same time, best mechanical characteristics, especially excellent resistance to bending stresses.

[0019] Another object of the present invention is to propose a strengthening plate for a shoe, which is cheap and which ensures particularly simple and rapid fastening and/or removal of the heel insole.

[0020] A further object of the present invention is to propose a strengthening plate for a shoe of high reliability and strength standards in any shoe use condition, without any change of the shoe functionality.

[0021] The above mentioned, objects are achieved by the features of the independent claim, while preferred features are defined in the dependent claims.

[0022] The characteristic features of the present invention will be pointed out in the following description of some preferred embodiments, with reference to the enclosed drawings, in which:

- Figures 1a, 1b are schematic, respectively lateral and partially section, and top views of a strengthen-

ing plate for a shoe according to the prior art;

- Figures 2a, 2b are schematic corresponding lateral partial section and top views of a strengthening plate for a shoe proposed by the present invention;
- Figure 3 is a schematic perspective exploded view of the proposed strengthening plate together with a shoe, in assembled configuration.

[0023] With reference to the above drawings, the reference numeral 1 indicates the proposed strengthening plate for shoe, substantially formed by a central body C, in which a longitudinal groove 5 is made for increasing the strengthening plate bending resistance

[0024] An end A of the central body C forms a fork-like portion 2, defining a pair of prongs (2a,2b), while the other end B includes means 3 for fastening the strengthening plate 1 to a relative heel insole 10

[0025] The fork 2 is usually engaged by means for fastening the heel to the under-the-foot part of the shoe

[0026] A plurality of small teeth 4, aimed at being fitted in the heel insole 10, are situated in the inner area 20 of the fork-like portion 2, that is in the area of the inner edges of the prongs (2a,2b)

[0027] The plurality of teeth 4, each of which extends orthogonal to the fork 2, allows a mutual fastening of the strengthening plate 1 to the heel insole 10, together with the coupling means 3.

[0028] Advantageously, the central body C and the relative ends A, B connected thereto, define a substantially curved plate with the concavity turned toward the heel insole 10.

[0029] The coupling means 3 include preferably a through hole 30, made in the area of the relative end B.

[0030] The edges 30a of the hole 30 form a toothed crown 31, which is aimed at being fitted in the heel insole 10 in order to fasten the latter to the strengthening plate 1 (Figure 2a)

[0031] Otherwise, the coupling means 3 can include a peg, fastened to the heel insole 10, aimed at snap-fitting into the through Hole 30, thus keeping the strengthening plate 1 fastened thereto

[0032] According to a preferred embodiment, the Longitudinal groove 5 is substantially symmetrical with respect to the central body C and substantially aligned with the prongs (2a,2b) of the fork 2, as well as with the through hole 30 (Figure 2b).

[0033] Like the central body C, each prong (2a, 2b) of the fork 2 features a corresponding additional groove 50, extending longitudinally thereto (figure 2b).

[0034] According to another embodiment (not shown), the teeth 4 can be made in the outer area of the fork-like portion 2, that is in the area of the outer edges of the prongs 2a 2b.

[0035] Independently from the embodiment applied, in relation to the positioning of the teeth 4 with respect to the fork-like portion 2, and independently from the type

of the coupling means 3 (a peg or toothed crown), the coupling between the proposed strengthening plate 1 and the corresponding heel insole 10 is obtained by the contemporary action of the teeth 4 fitted in the heel insole 10 and the above mentioned coupling means 3

[0036] It is obvious that the proposed strengthening plate 1 for footwear, considering a pre-established axial extension D1 thereof, ensures better mechanical bending resistance characteristics with respect to the examples of prior art due to the longitudinally longer extension D3 (>D2; Figure 1b) of the groove 5

[0037] Moreover, the proposed solution eliminates almost completely weakened sections, which could jeopardize the strengthening plate force, like for instance making holes in the area comprised between the longitudinal groove and the fork, according to prior art (Figure 1b).

[0038] In the area of the fork-like end, the stability of the coupling between the strengthening plate and the heel insole is advantageously ensured by the inner or outer teeth formed by the fork

[0039] In the area of the other end, the mutual coupling between the Strengthening plate and the heel insole is obtained by traditional techniques, that is by using buttons and/or pins, or by punching the through hole in order to define a toothed crown turned toward the heel insole

[0040] Consequently, the operations of coupling and/or removing of the strengthening plate to/from the heel insole are particularly simple and rapid, which has a positive effect on the production costs.

[0041] Therefore, the strengthening plate proposed by the present invention assures high reliability and strength standards in any shoe use condition, without any change of the shoe functionality

[0042] It is to be pointed out that the positioning of the teeth in the inner area of the fork allows to use, during the production thereof, parts of material which otherwise would be waste material, i.e. off-cuts

Claims

1. Strengthening plate for footwear, including:

a fork-like portion (2), formed in the area of a first end (A) of said strengthening plate (1), defining at least one pair of prongs (2a,2b);
means (3) for coupling the plate (1) to a relative heel insole (10), said coupling means (3) being situated at least in the area of a second end (B) of the plate (1);
at least one small tooth (4) extending substantially crosswise to said fork-like portion (2) for being fitted in said heel insole (10) to define a mutual coupling between the latter and said strengthening plate (1), in co-operation with said coupling means (3);
and characterized in that said at least one

small tooth (4) is situated on the edges of said prongs (2a, 2b) so that the stability of the coupling between the strengthening plate (1) and the heel insole (10) is ensured.

2. Strengthening plate, according to claim 1, **characterized in that** said small tooth (4) is situated in the inner area (20) of said fork-like portion (2) defined by the inner edges of the prongs (2a,2b).
3. Strengthening plate, according to claim 1, **characterized in that** said small tooth (4) is situated in the outer area of said fork-like portion (2) defined by the outer edges of the prongs (2a,2b).
4. Strengthening plate, according to any of the previous claims, **characterized in that** it includes, in a area of said fork-like portion (2) defined by the edges of said prongs (2a, 2b), a plurality of small teeth (4) extending substantially orthogonal to the fork-like portion (2) and aimed at being fitted in said heel insole (10).
5. Strengthening plate, according to any of the previous claims, **characterized in that** it includes, in the area of a central body (C), that is in the area comprised between said first end (A) and second end (B), at least one longitudinal groove (5), aimed at increasing at least the bending resistance of said strengthening plate (1).
6. Strengthening plate, according to claim 5, **characterized in that** said central body (C) and said first end (A) and second end (B) connected thereto, define a substantially curved plate with the concavity turned toward the heel insole (10).
7. Strengthening plate, according to claim 1, **characterized in that** said coupling means (3) include a through hole (30), made in the area of said second end (B), with the edges (30a) of said hole (30) forming a toothed crown (31), which is aimed at being fitted in said heel insole (10) in order to obtain a mutual coupling between the latter and said strengthening plate (1).
8. Strengthening plate, according to claim 7, **characterized in that** said through hole (30) is snap-fittable by a peg made in said heel insole (10)
9. Strengthening plate, according to claim 1, **characterized in that** it includes, in the area of at least one prong (2a,2b) of said fork-like portion (2), at least one additional groove (50), extending longitudinally with respect to said prong (2a,2b) and aimed at increasing at least the bending resistance of said fork (2).

10. Strengthening plate, according to claim 9, **characterized in that** it includes, in the area of each prong (2a,2b) of said fork-like portion (2), a corresponding additional groove (50) extending longitudinal to the relative prong (2a,2b).

11. Strengthening plate, according to claim 5, **characterized in that** said longitudinal groove (5) is substantially symmetrical with respect to said central body (C) and substantially aligned with said prongs (2a,2b) of said fork-like portion (2).

12. Strengthening plate, according to claim 11 and 7 or 8, **characterized in that** said longitudinal groove (5) is substantially aligned with said through hole (30).

Patentansprüche

1. Verstärkungsplatte für Schuhwerk mit einem gabelförmigen Abschnitt (2), der im Bereich eines ersten Endes (A) der Verstärkungsplatte (1) ausgebildet ist und mindestens ein Paar von Zinken (2a, 2b) bildet;
Einrichtungen (3) zum Verbinden der Platte (1) mit einer Absatzbrandsohle (10), wobei die Verbindungseinrichtungen (3) mindestens im Bereich eines zweiten Endes (B) der Platte (1) angeordnet sind;
mindestens einem kleinen Zahn (4), der sich im Wesentlichen quer zum gabelförmigen Abschnitt (2) erstreckt, um in die Absatzbrandsohle (10) eingepasst zu werden und eine wechselseitige Verbindung zwischen dieser und der Verstärkungsplatte (1) in Zusammenarbeit mit den Verbindungseinrichtungen (3) auszubilden;
dadurch gekennzeichnet, dass der mindestens eine kleine Zahn (4) auf den Rändern der Zinken (2a, 2b) angeordnet ist, so dass die Stabilität der Verbindung zwischen der Verstärkungsplatte (1) und der Absatzbrandsohle (10) sichergestellt wird.
2. Verstärkungsplatte nach Anspruch 1, **dadurch gekennzeichnet, dass** der kleine Zahn (4) im von den Innenrändern der Zinken (2a, 2b) gebildeten Innenbereich (20) des gabelförmigen Abschnittes (2) angeordnet ist.
3. Verstärkungsplatte nach Anspruch 1, **dadurch gekennzeichnet, dass** der kleine Zahn (4) im von den Außenrändern der Zinken (2a, 2b) gebildeten Außenbereich des gabelförmigen Abschnittes (2) angeordnet ist.
4. Verstärkungsplatte nach einem der vorangehenden Ansprüche, **dadurch gekennzeichnet, dass** sie in einem von den Rändern der Zinken (2a, 2b) gebildeten Bereich des gabelförmigen Abschnittes (2) ei-

ne Vielzahl von kleinen Zähnen (4) aufweist, die sich im Wesentlichen senkrecht zum gabelförmigen Abschnitt (2) erstrecken und dazu dienen, in die Absatzbrandsohle (10) eingepasst zu werden.

5. Verstärkungsplatte nach einem der vorangehenden Ansprüche, **dadurch gekennzeichnet, dass** sie im Bereich eines Zentralabschnittes (C), der sich in dem zwischen dem ersten Ende (A) und dem zweiten Ende (B) angeordneten Bereich befindet, mindestens eine Längsnut (5) aufweist, die dazu dient, mindestens den Biegewiderstand der Verstärkungsplatte (1) zu erhöhen.
6. Verstärkungsplatte nach Anspruch 5, **dadurch gekennzeichnet, dass** der Mittelabschnitt (C) und das damit verbundene erste Ende (A) und zweite Ende (B) eine im Wesentlichen gekrümmte Platte mit in Richtung auf die Absatzbrandsohle (10) weisender Konkavität bilden.
7. Verstärkungsplatte nach Anspruch 1, **dadurch gekennzeichnet, dass** die Verbindungseinrichtungen (3) ein Durchgangsloch (30) aufweisen, das im Bereich des zweiten Endes (B) ausgebildet ist, wobei die Ränder (30a) des Lochs (30) eine Zahnkrone (31) bilden, die dazu dient, in die Absatzbrandsohle (10) eingepasst zu werden, um eine wechselseitige Verbindung zwischen der Absatzbrandsohle und der Verstärkungsplatte (1) zu erhalten.
8. Verstärkungsplatte nach Anspruch 7, **dadurch gekennzeichnet, dass** das Durchgangsloch (30) mit Hilfe eines in der Absatzbrandsohle (10) ausgebildeten Zapfens einrastbar ist.
9. Verstärkungsplatte nach Anspruch 1, **dadurch gekennzeichnet, dass** sie im Bereich von mindestens einem Zinken (2a, 2b) des gabelförmigen Abschnittes (2) mindestens eine zusätzliche Nut (50) aufweist, die sich in Längsrichtung relativ zum Zinken (2a, 2b) erstreckt und dazu dient, mindestens den Biegewiderstand der Gabel (2) zu erhöhen.
10. Verstärkungsplatte nach Anspruch 9, **dadurch gekennzeichnet, dass** sie im Bereich eines jeden Zinkens (2a, 2b) des gabelförmigen Abschnittes (2) eine entsprechende zusätzliche Nut (50) aufweist, die sich in Längsrichtung zum entsprechenden Zinken (2a, 2b) erstreckt.
11. Verstärkungsplatte nach Anspruch 5, **dadurch gekennzeichnet, dass** die Längsnut (5) im Wesentlichen symmetrisch zum Mittelabschnitt (C) ist und im Wesentlichen zu den Zinken (2a, 2b) des gabelförmigen Abschnittes (2) ausgerichtet ist.
12. Verstärkungsplatte nach Anspruch 11 und 7 oder 8,

dadurch gekennzeichnet, dass die Längsnut (5) im Wesentlichen zum Durchgangsloch (30) ausgerichtet ist.

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Revendications

1. Plaque de renfort pour article chaussant, incluant :

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une partie semblable à une fourche (2), formée dans la région d'une première extrémité (A) de ladite plaque de renfort (1), définissant au moins une paire d'ardillons (2a, 2b),

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des moyens (3) pour coupler la plaque (1) à une semelle de talon correspondante (10), lesdits moyens de couplage (3) étant situés au moins dans la région d'une seconde extrémité (B) de la plaque (1) ;

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au moins une petite dent (4) s'étendant sensiblement de manière oblique par rapport à ladite partie semblable à une fourche (2) pour être fixée dans ladite semelle de talon (10) pour définir un couplage mutuel entre cette dernière et ladite plaque de renfort (2), en coopération avec lesdits moyens de couplage (3) ;

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et **caractérisée en ce que** ladite au moins une petite dent (4) est située sur les bords desdits ardillons (2a, 2b) de telle sorte que la stabilité du couplage entre la plaque de renfort (1) et la semelle de talon (10) est assurée.

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2. Plaque de renfort selon la revendication 1, **caractérisée en ce que** ladite petite dent (4) est située dans la région interne (20) de ladite partie semblable à une fourche (2) définie par les bords internes des ardillons (2a, 2b).

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3. Plaque de renfort selon la revendication 1, **caractérisée en ce que** ladite petite dent (4) est située dans la région externe de ladite partie semblable à une fourche (2) définie par les bords externes des ardillons (2a, 2b).

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4. Plaque de renfort selon l'une quelconque des revendications précédentes, **caractérisée en ce qu'elle** inclut, dans une région de ladite partie semblable à une fourche (2) définie par les bords desdits ardillons (2a, 2b), une pluralité de petites dents (4) s'étendant sensiblement de façon orthogonale par rapport à la partie semblable à une fourche (2) et destinées à être fixées dans ladite semelle de talon (10).

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5. Plaque de renfort selon l'une quelconque des revendications précédentes, **caractérisée en ce qu'elle** inclut, dans la région d'un corps central (C), qui est dans la région comprise entre ladite première extrémité (A) et ladite seconde extrémité (B), au moins

une rainure longitudinale (5), destinée à augmenter au moins la résistance à la flexion de ladite plaque de renfort (1).

6. Plaque de renfort selon la revendication 5, **caractérisée en ce que** ledit corps central (C) et ladite première extrémité (A) et ladite seconde extrémité (B) raccordées à celui-là, définissent une plaque sensiblement courbe avec la concavité orientée vers la semelle de talon (10). 5
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7. Plaque de renfort selon la revendication 1, **caractérisée en ce que** lesdits moyens de couplage (3) incluent un trou traversant (30), pratiqué dans la région de ladite seconde extrémité (B), avec les bords (30a) dudit trou (30) formant une couronne dentelée (31), qui est destinée à être fixée dans ladite semelle de talon (10) afin d'obtenir un couplage mutuel entre cette dernière et ladite plaque de renfort (1). 15
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8. Plaque de renfort selon la revendication 7, **caractérisée en ce que** ledit trou traversant (30) peut être fixé par encliquetage par une cheville réalisée dans ladite semelle de talon (10). 25

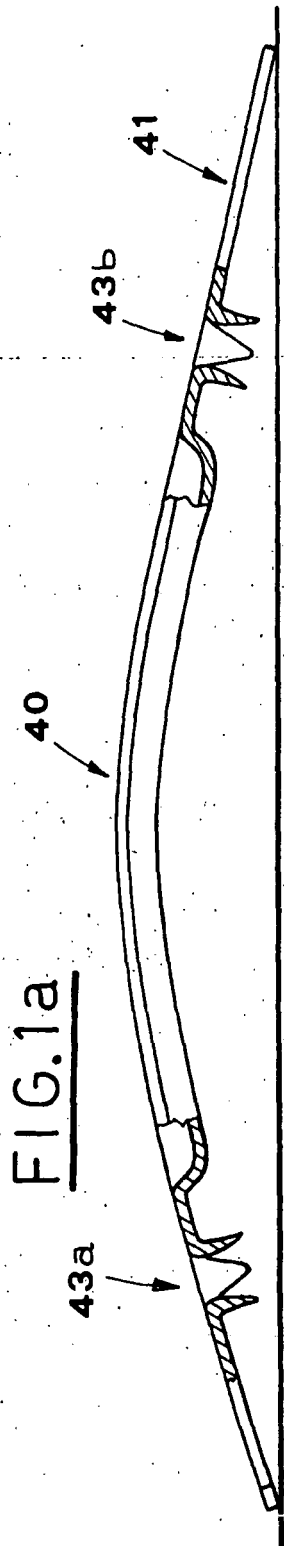
9. Plaque de renfort selon la revendication 1, **caractérisée en ce qu'elle** inclut, dans la région d'au moins un ardillon (2a, 2b) de ladite partie semblable à une fourche (2), au moins une rainure supplémentaire (50) s'étendant longitudinalement par rapport audit ardillon (2a, 2b) et destinée à augmenter au moins la résistance à la flexion de ladite fourche (2). 30

10. Plaque de renfort selon la revendication 9, **caractérisée en ce qu'elle** inclut, dans la région de chaque ardillon (2a, 2) de ladite partie semblable à une fourche (2), une rainure supplémentaire correspondante (50) s'étendant de façon longitudinale à l'ardillon correspondant (2a, 2b). 35
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11. Plaque de renfort selon la revendication 5, **caractérisée en ce que** ladite rainure longitudinale (5) est sensiblement symétrique par rapport audit corps central (C) et est sensiblement alignée avec lesdits ardillons (2a, 2b) de ladite partie semblable à une fourche (2). 45

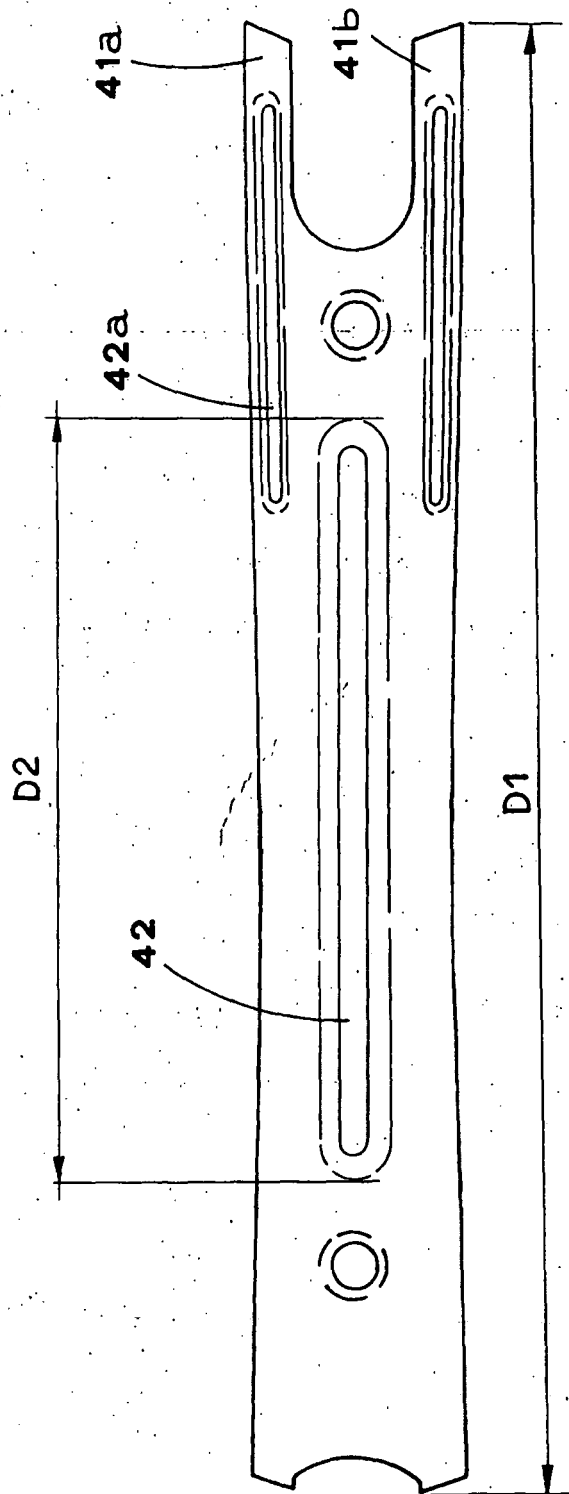
12. Plaque de renfort selon la revendication 11 et 7 ou 8, **caractérisée en ce que** ladite rainure longitudinale (5) est sensiblement alignée avec ledit trou traversant (30). 50

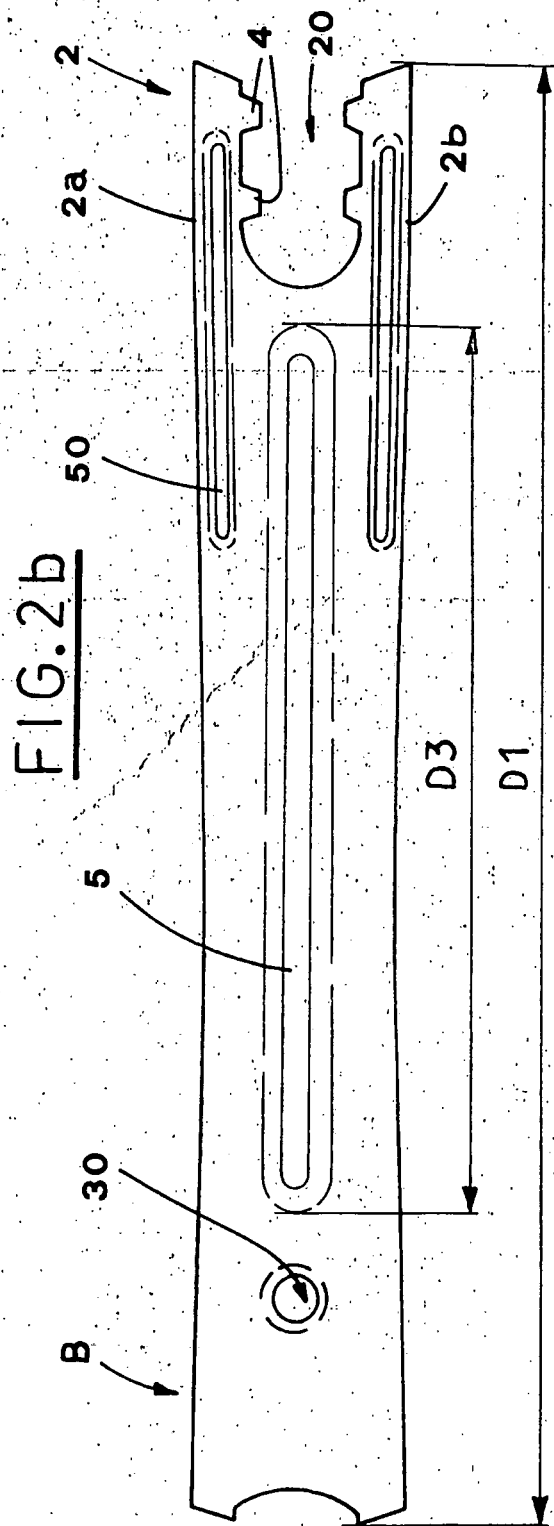
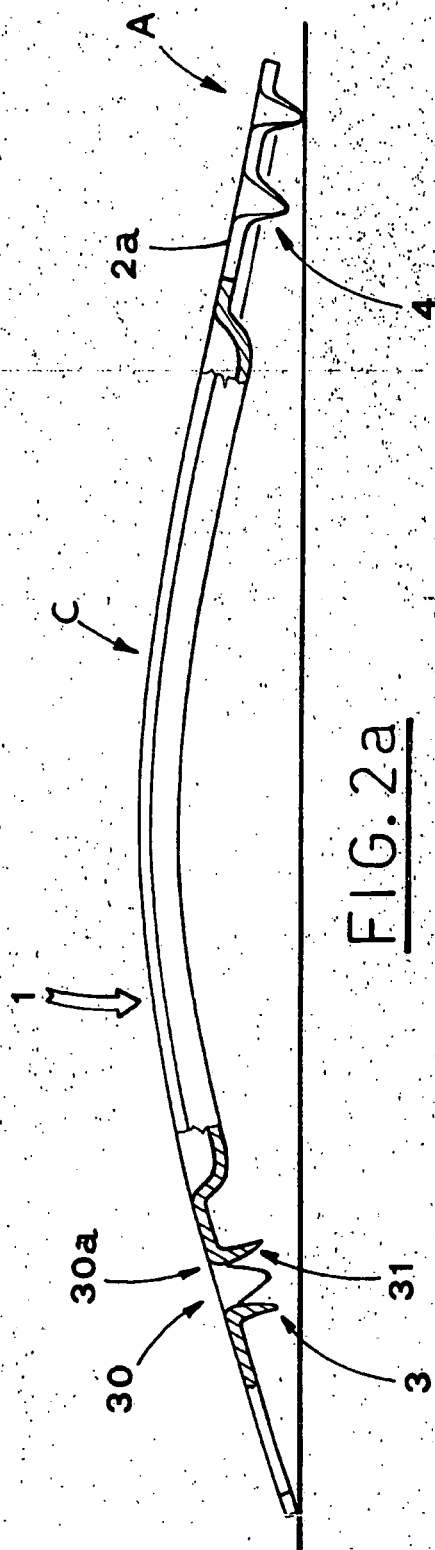
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PRIOR ART

FIG.1b





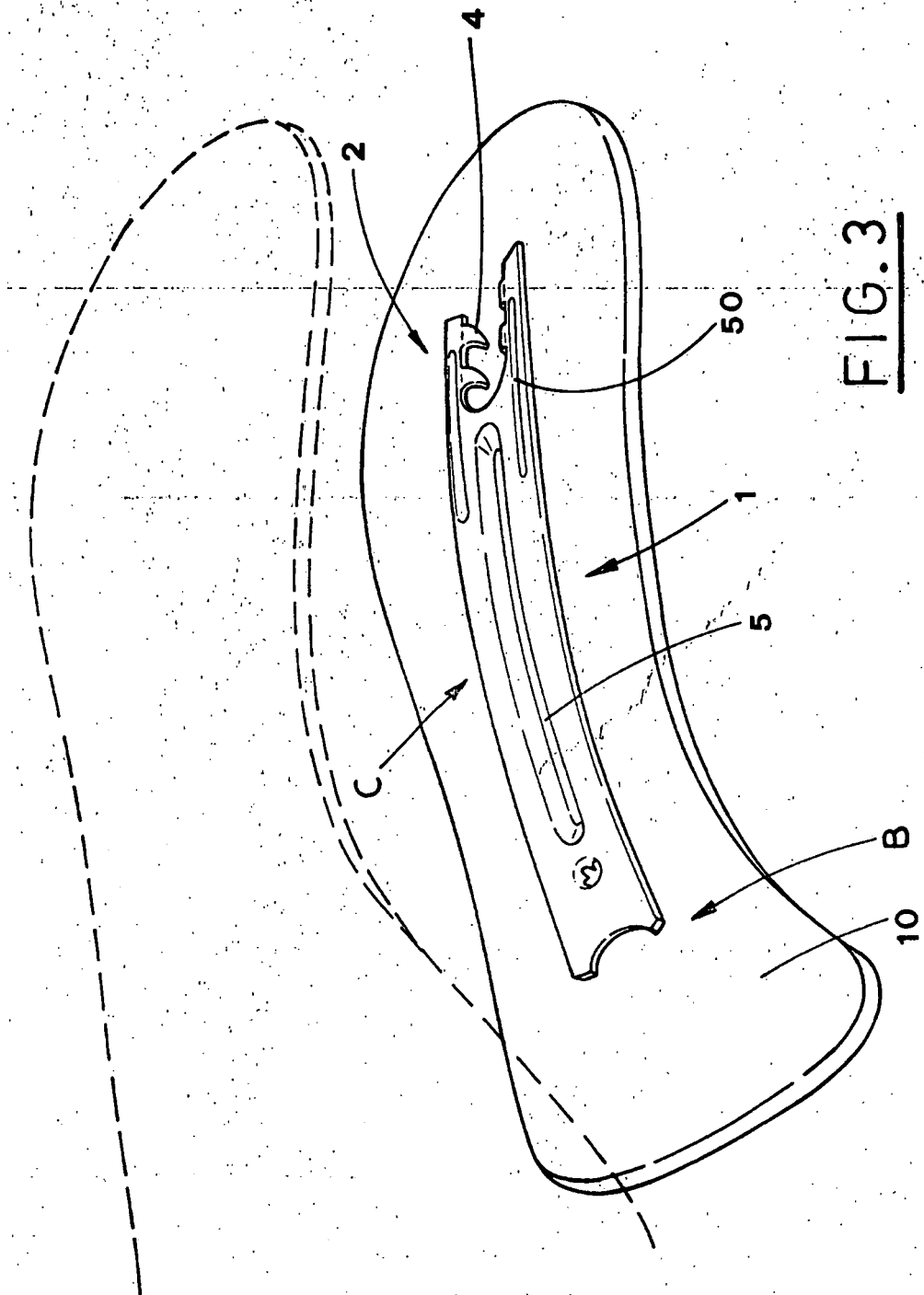


FIG. 3

REFERENCES CITED IN THE DESCRIPTION

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