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(54) **Strengthening plate for footwear**

(57) The proposed strengthening plate (1) for footwear includes a fork-like portion (2), formed in the area of an end (A). Means (3) for coupling the strengthening plate (1) to a relative heel insole (10) are situated at least

in the area of the other end (B). A plurality of small teeth (4), formed by the fork (2) are aimed at being fitted in the heel insole (10) in order to obtain a mutual coupling between the latter and the strengthening plate (1).

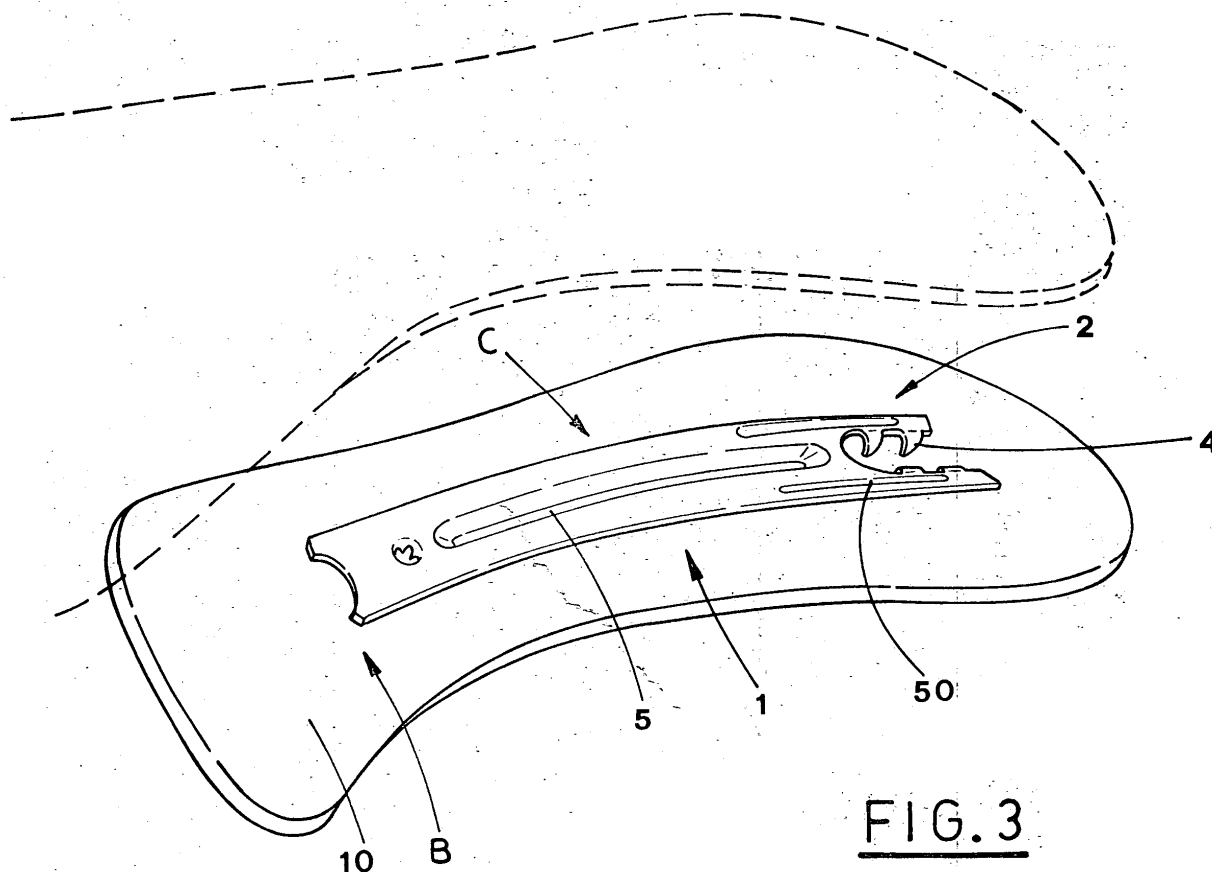


FIG. 3

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 areas 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 a winner 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 foresee.

[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] 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 insoles and, at the same time, best mechanical characteristics, especially excellent resistance to bending stresses.

[0017] Another object of the present invention is to propose a strengthening plates for a shoe, which is cheap and which ensures particularly simple and rapid fastening and/or removal of the heel insole.

[0018] 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.

[0019] The above mentioned, objects are achieved by the features of the independent claim, while preferred features are defined in the dependent claims.

[0020] 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 strengthening 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 shoes 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.

[0021] 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.

[0022] 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.

[0023] The fork 2 is usually engaged by means for fastening the heel to the under-the-foot part of the shoe.

[0024] 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).

[0025] 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.

[0026] 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.

[0027] The coupling means 3 include preferably a through hole 30, made in the area of the relative end B.

[0028] 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).

[0029] Otherwise, the coupling means 3 can include a peg, fastened to the heel insole 10, aimed at snapping into the through hole 30, thus keeping the strengthening plate 1 fastened thereto.

[0030] 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).

[0031] Like the central body C, each prong (2a, 2b) of the fork 2 features a corresponding additional groove 50, extending longitudinally thereto (figure 2b).

[0032] 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.

[0033] 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.

[0034] 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.

[0035] 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).

[0036] 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.

[0037] 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.

[0038] 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.

[0039] 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 shoes functionality.

[0040] 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.

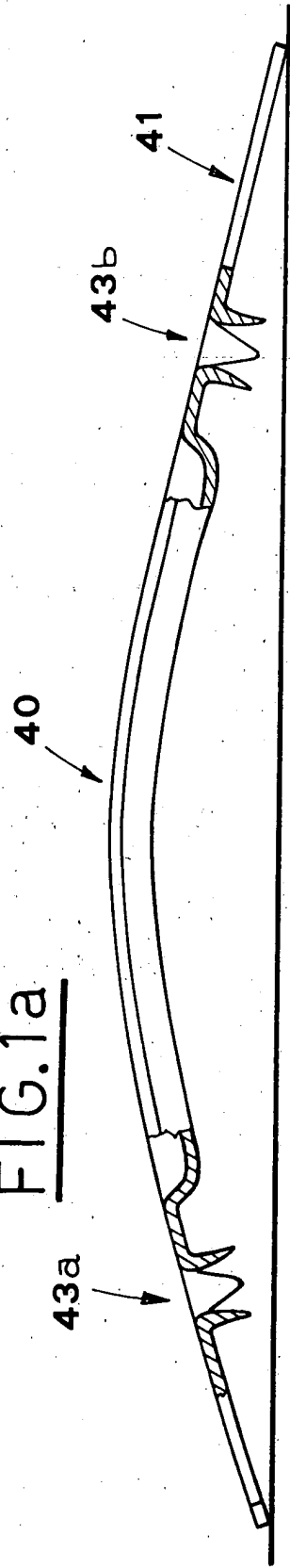
Claims

1. Strengthening plate for footwear, including a fork-like portion (2), formed in the area of an end (A), defining at least one pair of prongs (2a,2b); means (3) for coupling said strengthening plate (1) to a relative heel insole (10), said coupling means being situated at least in the area of the other end (B); **characterized in that** it includes at least one small tooth (4), situated in the area of said fork-like portion (2) and extending substantially crosswise thereto, said small tooth (4) being aimed at being fitted in said heel insole (10), in order to define a mutual coupling between the latter and said strengthening plate (1), in cooperation with said coupling means (3).
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), i.e. in the area 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), i.e. in the area 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 the area of said fork-like portion (2), 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 the central body (C), that is in the area com-

prised between said ends (A,B), at least one longitudinal groove (5), aimed at increasing at least the bending resistance of said strengthening plate (1).

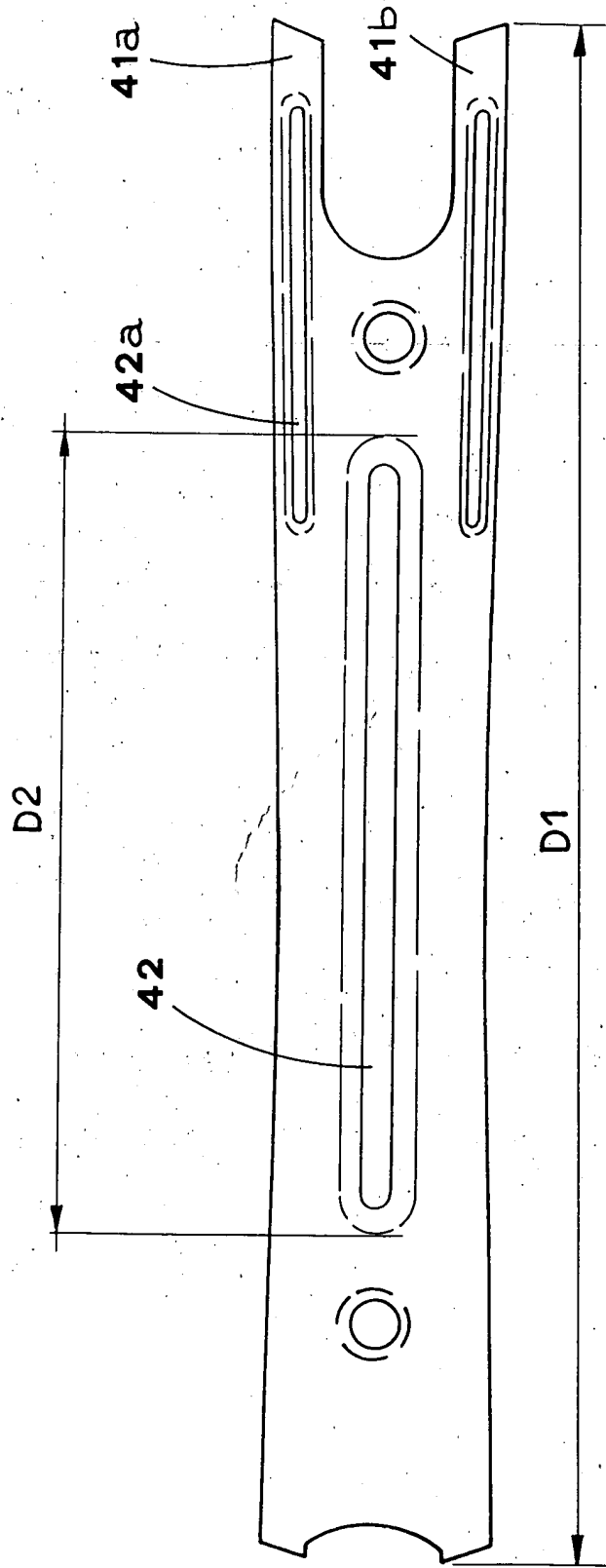
6. Strengthening plate, according to claim 5, **characterized in that** said central body (C) and said ends (A,B) connected thereto, define a substantially curved plate with the concavity turned toward the heel insole (10). 5
10
7. Strengthening plate, according to claim 1, **characterized in that** said coupling means (3) include a through hole (30), made in the area of said 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). 15
8. Strengthening plate, according to claim 1, **characterized in that** said coupling means (3) include a peg, made in said heel insole (10), aimed at snap-fitting into said through hole (30), made in the area of the end (B) in order to obtain a mutual coupling between the latter and said strengthening plate (1). 20
25
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). 30
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 grooves (50) extending longitudinal to the relative prong (2a,2b). 35
40
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). 45
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). 50
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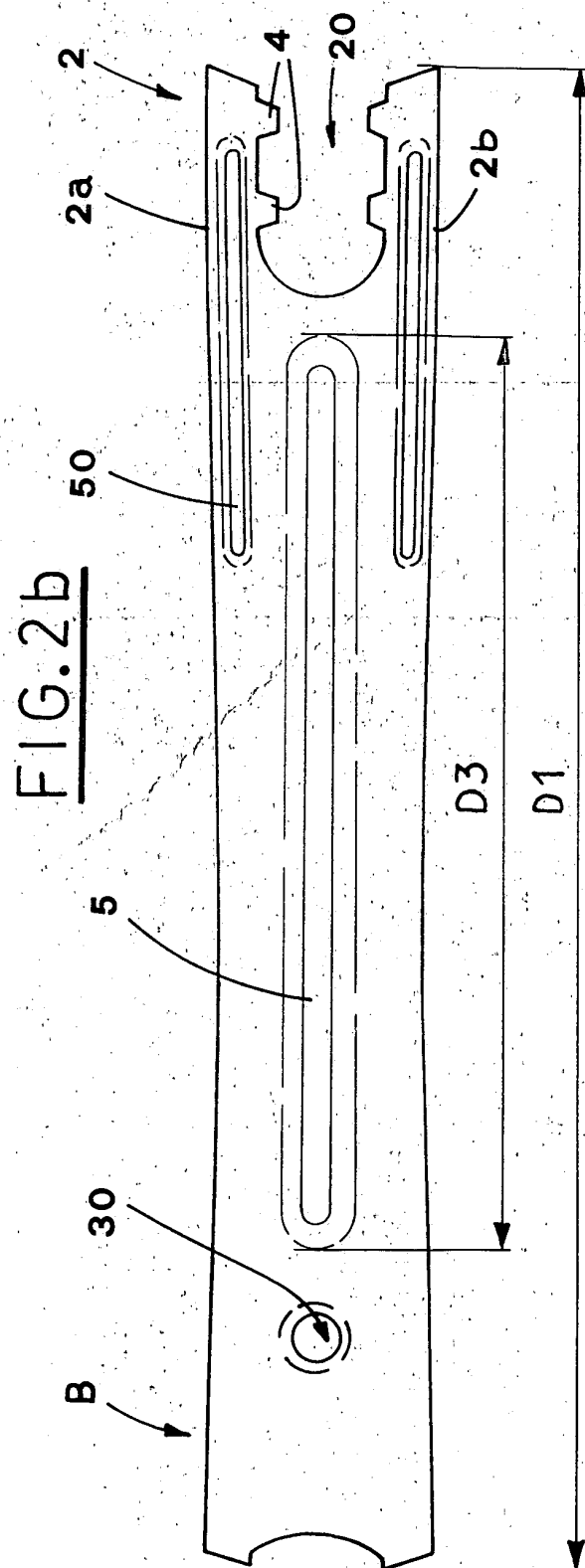
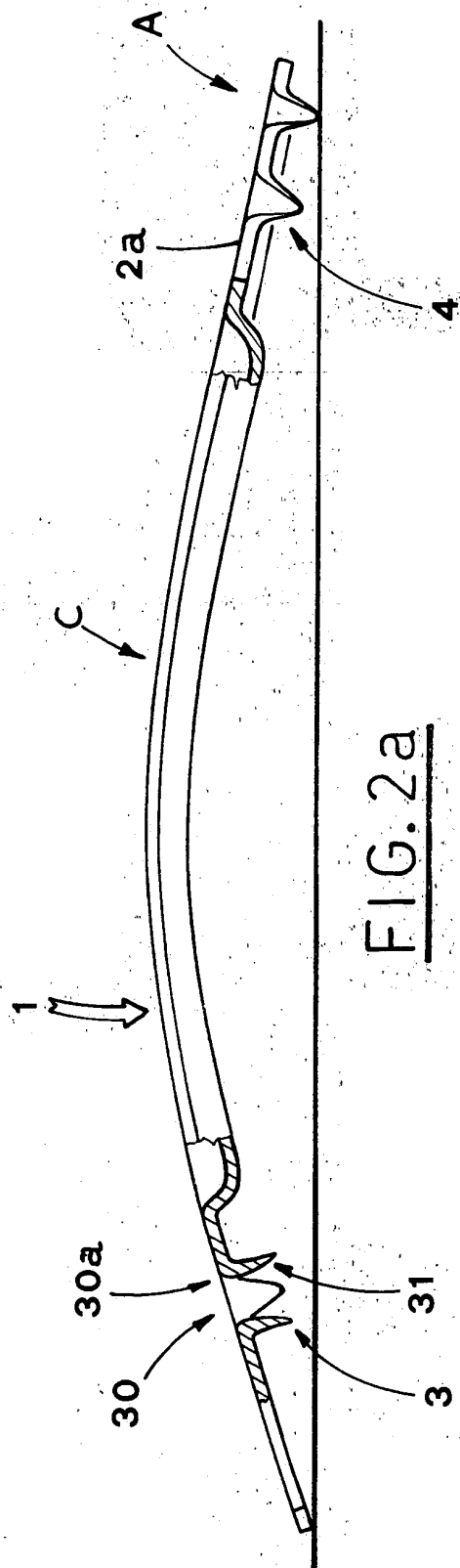
FIG.1a



PRIOR ART

FIG.1b





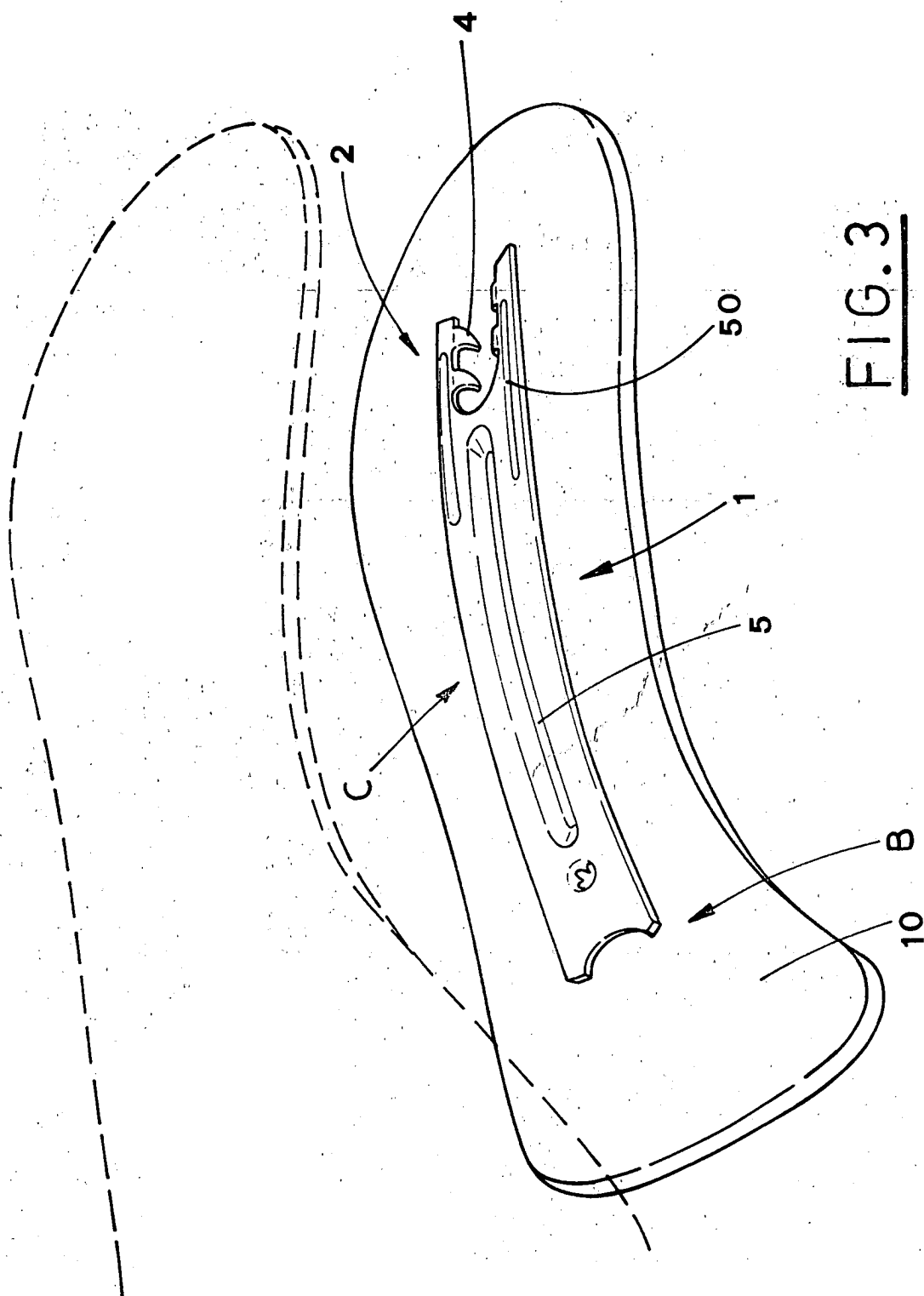


FIG. 3



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EUROPEAN SEARCH REPORT

Application Number
EP 03 00 5464

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
X	US 1 490 991 A (GEORGE TILSON WILLIAM ET AL) 22 April 1924 (1924-04-22) * the whole document * ---	1,4	A43B13/22 A43B13/41 A43B23/22
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A	US 1 792 838 A (HENDERSON JESSE T) 17 February 1931 (1931-02-17) * the whole document * ---	1,5	
A	US 1 638 137 A (BARTELS REINHARD E) 9 August 1927 (1927-08-09) * the whole document * ---	1,4,5	
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The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (Int.Cl.7) A43B
Place of search THE HAGUE		Date of completion of the search 26 June 2003	Examiner Claudel, B
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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**ANNEX TO THE EUROPEAN SEARCH REPORT
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EP 03 00 5464

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26-06-2003

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US 1792838	A	17-02-1931	NONE
US 1638137	A	09-08-1927	NONE
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