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(54) **METHOD FOR PRODUCING LEVER ARMS/U-CLIPS FOR ALUMINIUM FASTENING DEVICES FOR SPORTS FOOTWEAR**

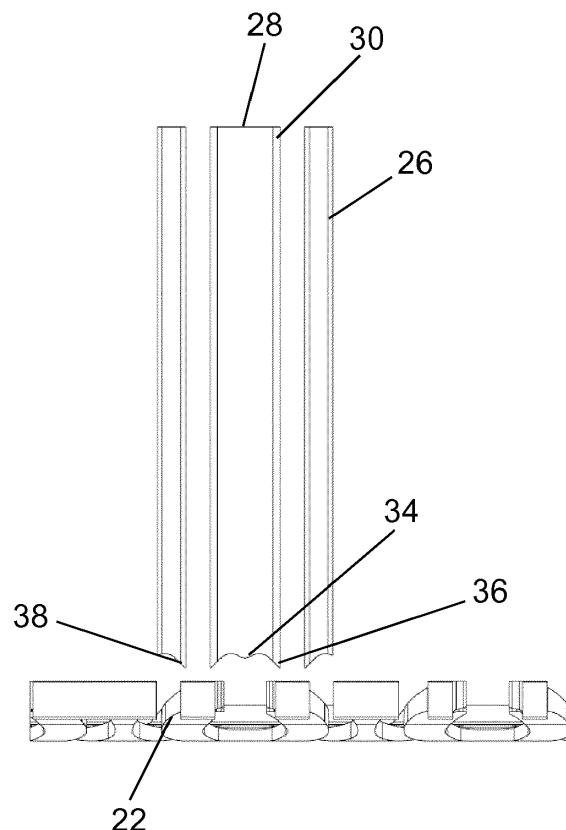
(57) A method for producing lever arms/U-clips for aluminium fastening devices for sports footwear, comprising:

- an initial step of extruding an aluminium billet to obtain a longitudinal profile (2) of cross-section corresponding to the cross-section of the lever arm/U-clip to be obtained, and provided at one end with two parallel longitudinal holes (4, 6),

- subjecting the aluminium profile to a plurality of operations such as to obtain the clip or the lever arm in finished form.

characterised by:

- subjecting the prongs (40) of the lever arm/U-clip to pressing with at least one punch (24, 26, 28) which simultaneously trims the facing surfaces of the prongs (40) and the two outer surfaces of these in the region of the holes (4, 6).



## Description

**[0001]** The present invention relates to a method for producing lever arms/U-clips for aluminium fastening devices for sports footwear.

**[0002]** Lever arms for fastening devices for sports footwear are known. Said lever arms are substantially of U-shape, with the ends of the prongs being provided with two pairs of facing holes for engagement by a pivot pin of a fork rigid with the vamp and, respectively, by the pivot pin of the puller engaged in the U-clip.

**[0003]** These known arms present however the drawback of a substantial production cost by being generally obtained by pressing using automatic cropping machines.

**[0004]** An object of the invention is to eliminate these drawbacks by providing lever arms/U-clips obtainable easily and quickly at controlled cost.

**[0005]** Another object of the invention is to provide a lever arm/U-clip by an extrusion process with various operations aimed at obtaining a final product with no deformations at the pivot holes.

**[0006]** The present invention is further clarified hereinafter in terms of a preferred embodiment thereof, provided by way of non-limiting example with reference to the accompanying drawings, in which:

Figures 1 and 2 are perspective views showing the aluminium profile during the processing of the prongs,

Figure 3 is an enlarged detail thereof,

Figure 4 is a lateral view thereof, and

Figure 5 shows a lever obtained by the method according to the invention.

**[0007]** As can be seen from the figures, the method according to the invention comprises an initial step of extruding an aluminium billet to obtain a longitudinal profile, the cross-section of which is slightly arched to conform to the lever to be obtained, and is provided at one end with two parallel longitudinal holes 4, 6.

**[0008]** The method according to the invention proposes to provide, in a first region of the profile, two curved slotted holes 8 and a substantially diamond-shaped central hole 10 with appendix 12.

**[0009]** The profile is then subjected to a step of pressing along the edges of the slotted holes 8 and of the diamond-shaped hole 10, by which they are widened, with the formation of a sidepiece 14 of thickness less than that of the profile, to provide a substantial material stiffening.

**[0010]** The profile is then subjected to a step of trimming the lesser-thickness sidepieces 14 and then to a step of blanking in the region of the holes 10 to form a substantially rectangular seat 16 provided with a pair of end appendices 18 and a pair of intermediate ribs 20 interposed between the two holes.

**[0011]** The profile arranged in this manner is then sub-

jected to the action of two punches (not represented in the drawings) which define the ends of the prongs 40 of the lever under formation.

**[0012]** The profile obtained in this manner is then subjected to the action of a die indicated overall by 24 and composed of three spaced-apart punches, of which two, 26, are symmetrical about a central punch 28.

**[0013]** In particular, the central punch 28 has a substantially rectangular cross-section with the major surfaces 30 perpendicular to the axis of the profile and provided with two grooves 32 having dimensions suitable for mounting onto the ribs 20 provided on the prongs 40. The lower surface 34 of the punch forms, with the lower end of the major lateral surfaces 30, two blades 36 spaced apart by a distance greater than the distance between the facing surfaces of the prongs 40.

**[0014]** The end punches 26 are also of substantially rectangular cross-section, their lower surface forming a blade 38 with one of the major lateral surfaces.

**[0015]** During its descent, the punch 28 simultaneously cuts the portions of the two facing surfaces of the prongs 40 with the two blades 36, while the two punches 26 cut with their blade 38 the outer surface of the two prongs 40.

**[0016]** In this manner, any pinching defects of the holes 46 resulting from the preceding operations are eliminated.

**[0017]** In a modified embodiment of a clip (not illustrated in the drawings) the procedure starts from an aluminium profile of cross-section corresponding to the cross-section of the clip and provided in its two longitudinal edges with a longitudinal hole.

**[0018]** After subjecting the profile to a series of operations to obtain the clip, this is subjected to trimming by the three punches which cut the prongs formed at the end of the clip in positions corresponding to their facing surfaces and to their outer surfaces.

## Claims

1. A method for producing lever arms/U-clips for aluminium fastening devices for sports footwear, comprising:

- an initial step of extruding an aluminium billet to obtain a longitudinal profile (2) of cross-section corresponding to the cross-section of the lever arm/U-clip to be obtained, and provided at one end with two parallel longitudinal holes (4, 6),
- subjecting the aluminium profile to a plurality of operations such as to obtain the clip or the lever arm in finished form.

**characterised by:**

- subjecting the prongs (40) of the lever arm/U-clip to pressing with at least one punch (24, 26, 28) which simultaneously

trims the facing surfaces of the prongs (40) and the two outer surfaces of these in the region of the holes (4, 6).

2. A method as claimed in claim 1, **characterised in that** the initial step in forming the lever arm/U-clip involves the formation, in a first region of the profile, of two curved slotted holes (8) and a substantially diamond-shaped central hole (10) with appendix (12). 5 10
3. A method as claimed in claim 2, **characterised by** subjecting the profile to a step of pressing along the edges of the slotted holes (8) and of the diamond-shaped hole (10) to form a sidepiece of thickness less than that of the profile. 15

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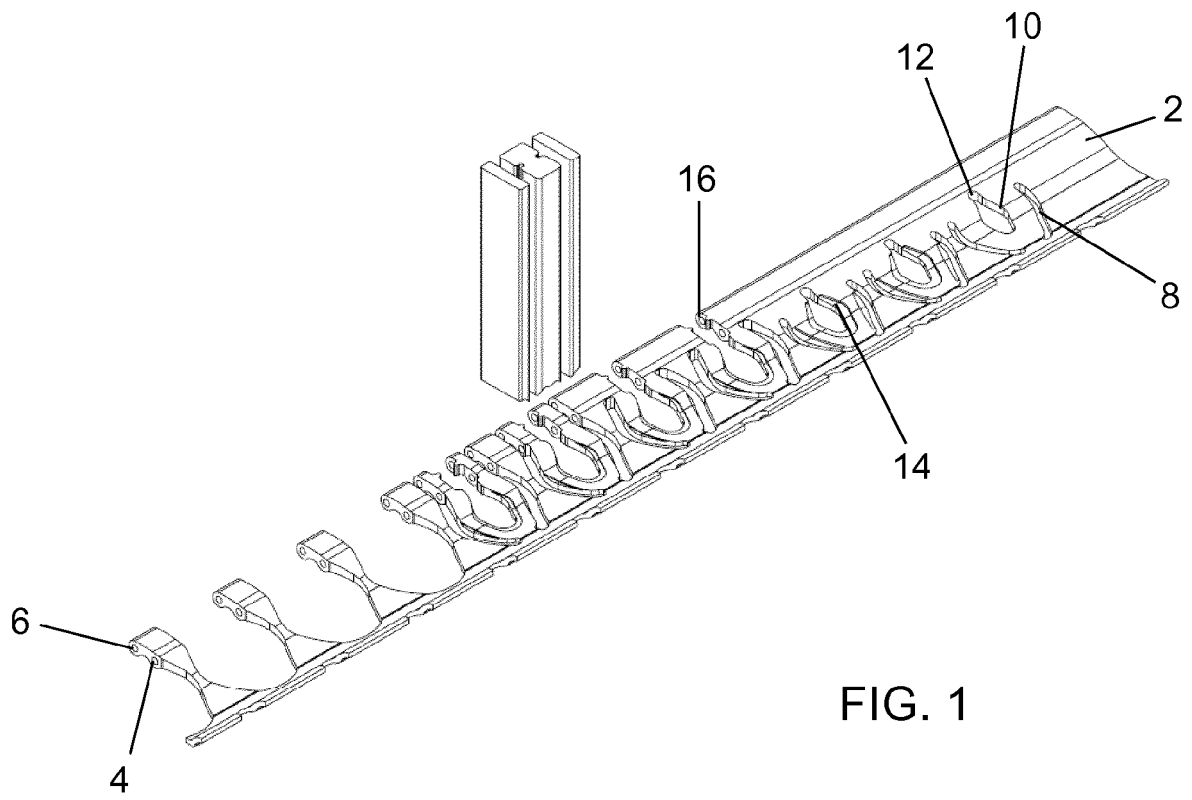


FIG. 1

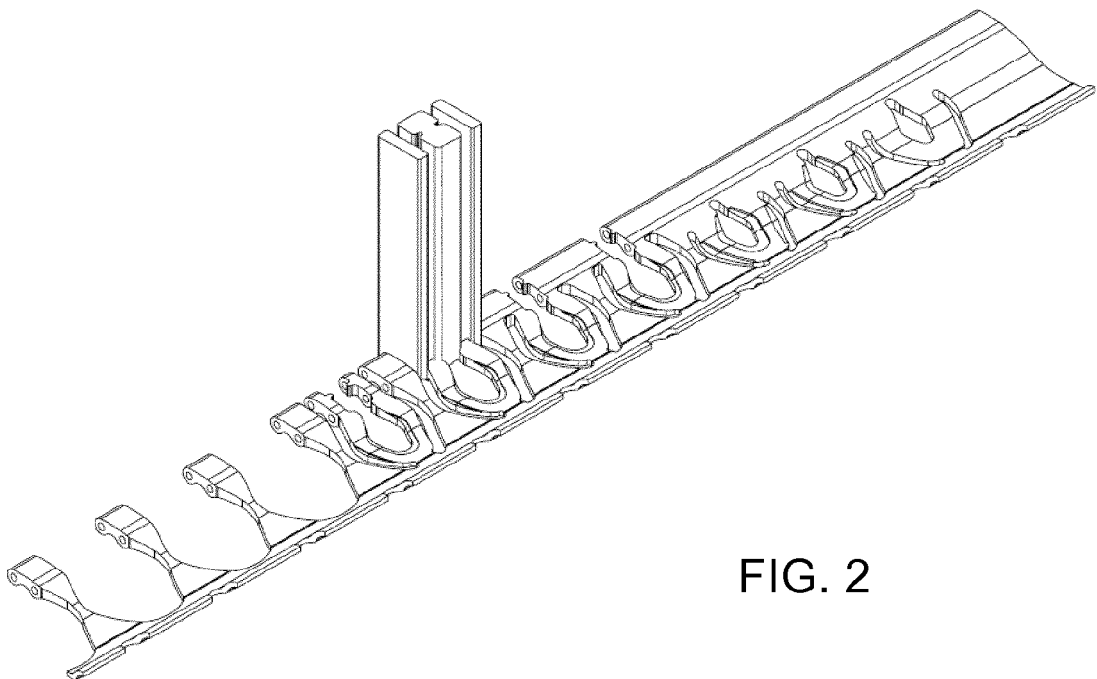


FIG. 2

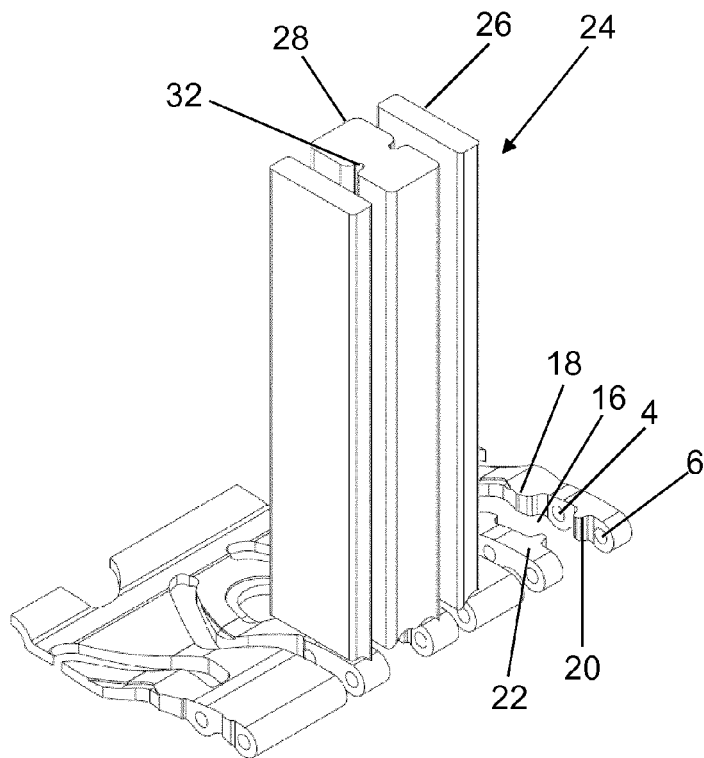


FIG. 3

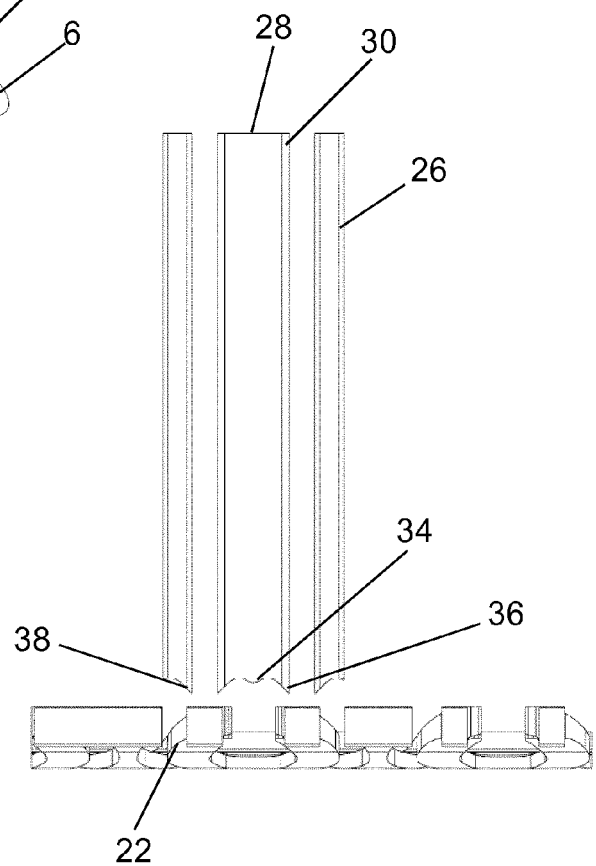


FIG. 4

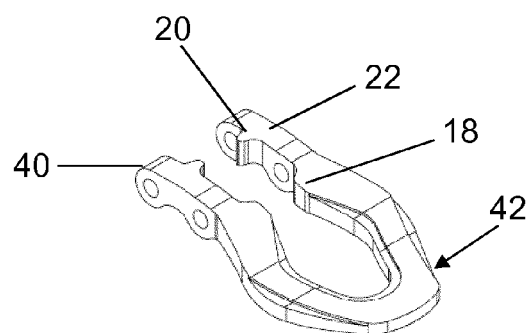


FIG. 5



## EUROPEAN SEARCH REPORT

Application Number  
EP 16 18 8687

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			TECHNICAL FIELDS SEARCHED (IPC)
			A43C A43D
The present search report has been drawn up for all claims			
Place of search <b>The Hague</b>		Date of completion of the search <b>19 January 2017</b>	Examiner <b>Cianci, Sabino</b>
<p><b>CATEGORY OF CITED DOCUMENTS</b></p> <p>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</p> <p>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 &amp; : member of the same patent family, corresponding document</p>			

EPO FORM 1503 03.82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT  
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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.  
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