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(54) **Metal sheet for obtaining an in-line roller skate frame and method for obtaining an in-line roller skate frame from such metal sheet**

(57) The present invention relates to a metal sheet (1) for obtaining an in-line roller skate frame and to a method for obtaining an in-line roller skates frame from such metal sheet. The metal sheet (1) according to the invention has a pair of longitudinal slits (3c,3d) separating the central portion (11) - intended to form the support for a skate boot in the frame - from the lateral portions (13, 15) - intended to form the side wings of said frame - so that the central portion (11) can be shaped at will independently from said lateral portions (13,15), so as to allow a high versatility as to the form and design of the frame itself. More particularly, said central portion can be shaped so that the rear region (11c) , intended to support the boot heel, is at a height from the ground greater than the front region (11a), intended to support the boot toe, thus increasing the user's comfort.

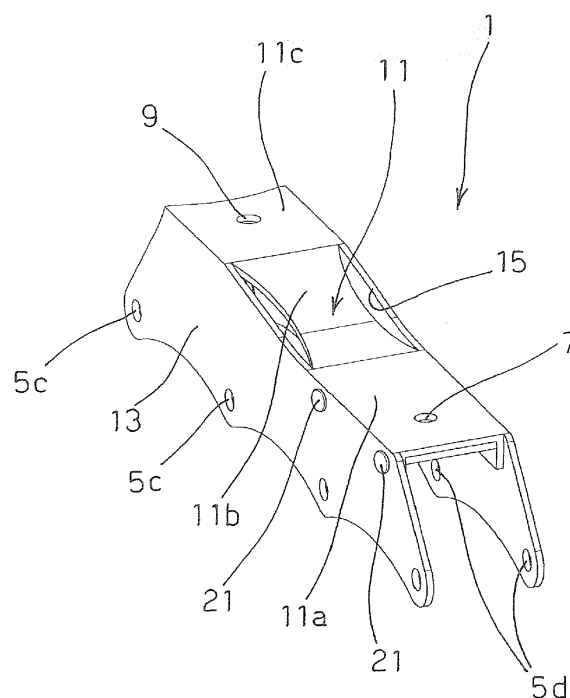


FIG. 1E

Description

Technical Field of the Invention

[0001] The present invention relates to a metal sheet for obtaining a frame for an in-line roller skate. The present invention also refers to a method for obtaining a frame for in-line roller skates starting from such a metal sheet.

Prior Art

[0002] As a rule, the frame for an in-line roller skate comprises a central support intended to receive the skate boot and a pair of side wings, between which a plurality of aligned wheels are mounted.

[0003] Said frame should be as light as possible, so as to improve the user's comfort during skating and avoid excessive and unnecessary efforts.

[0004] Moreover, manufacturing of said frame should be simple and inexpensive and it should allow to obtain a wide variety of different frame designs, even complicated ones, so as to satisfy the aesthetical requirements of the users.

[0005] Frames made of plastic or metallic material by casting molten material in a mould are known in the art.

[0006] Nevertheless, the costs for manufacturing such frames are very high, due to the expensiveness of the moulds as well as to the need for successive finishing and perfecting steps by mechanical machining.

[0007] Frames comprising a supporting base of plastic material and a pair of metallic side wings fastened to said supporting base by means of screws or other known fastening means and oriented in a direction opposite to the supporting base for the skate boot are known.

[0008] However, also the costs for manufacturing such frames are very high, due to the large number of different parts to be assembled together and to the large number of steps in the manufacturing process.

[0009] In order to obtain frames with a simpler structure and lower manufacturing costs, frames obtained from a metallic sheet folded into a "U"-shaped structure have also been developed. Nevertheless, even such frames are not free from drawbacks. First of all, since the frame is obtained by simply folding a metal sheet into a "U"-shaped structure, the number and variety of designs that can be obtained are limited. Secondly, in said frames the heel and the toe of the user are necessarily at the same level, which in general strongly limits the user's comfort.

[0010] The main object of the present invention is to overcome the drawbacks of prior art by providing a suitably shaped metal sheet that allows to obtain an in-line roller skate frame that is easy and inexpensive to manufacture while being at the same time versatile and comfortable.

[0011] A further object of the present invention is to provide a method for obtaining an in-line roller skate frame starting from a suitably shaped metal sheet that

allows to make the manufacturing process of said frame easy and inexpensive. These and other objects are achieved by a metal sheet and a method as claimed in the appended claims.

Disclosure of the Invention

[0012] The metal sheet according to the invention has a pair of longitudinal slits that separate the central portion - intended to form the central support of the in-line roller skate frame, onto which the skate boot is to be mounted - from the lateral portions - intended to form the wings of the in-line roller skate frame, between which the aligned wheels are to be mounted.

[0013] Thanks to this measure, in the frame obtained from the metal sheet according to the invention the central support and the side wings are independent from each other, so as to ensure a high versatility in the choice of the form and design of such frame.

[0014] Moreover, thanks to the presence of the longitudinal slits, the central portion of the metal sheet according to the invention in shaped as a strip which is partially separate and independent from the lateral portions, so that it can be shaped at will.

[0015] More particularly, it can be shaped so that the rear portion, intended to support the user's heel, is at a height from the ground greater than the front portion, intended to support the user's toe, which increases the user's comfort. Thanks to the fact that, once the longitudinal slits are made, the in-line roller skates frame is obtained by simply folding the metal sheet according to the invention, its manufacturing process is simple and inexpensive.

Brief Description of the Drawings

[0016] Advantages and features of the invention will be clearer from the following description of a preferred embodiment thereof, given by way of non-limiting example, with reference to the accompanying drawings, wherein:

- Figures 1A to 1D show the metal sheet according to the invention in various steps of the manufacturing process; and
- Figure 1E shows the roller skates frame obtained from the metal sheet of Figures 1A - 1D.

Description of a Preferred Embodiment of the Invention

[0017] With particular reference to Figure 1A, the metal sheet 1 according to the invention is shown.

[0018] Preferably said metal sheet 1 is made of light metal, such as aluminium.

[0019] Said sheet 1 has a substantially quadrilateral shape and it comprises a front side 1a and a rear side 1b, opposite and substantially parallel to each other, and a pair of lateral sides 1c, 1d, they too being opposed and

substantially parallel to each other. Said sheet 1 has a shape symmetrical about its longitudinal axis L, which is parallel to the lateral sides 1c, 1d and divides the front side 1a and the rear side 1b in substantially equal parts.

[0020] Preferably, the sides 1a - 1d are not straight, but they are shaped so as to give the desired appearance to the in-line roller skate frame made from the metal sheet 1.

[0021] According to the invention, the metal sheet 1 includes a pair of longitudinal slits 3c, 3d starting from the front side 1a and extending until near the rear side 1b and defining a central portion 11 and a pair of lateral portions 13, 15.

[0022] The slits 3c, 3d are preferably - but not necessarily - symmetrical with respect to the longitudinal axis L.

[0023] Said slits 3c, 3d extend in a substantially longitudinal direction, but they can be shaped according to a desired shape, thereby contributing to give the desired structure and appearance to the in-line roller skate frame made from the metal sheet 1.

[0024] In particular, the slits 3c, 3d are shaped so as to give a substantially "T"-shaped form to the central portion 11 with a wider front region 11a near the front side and a narrower intermediate region 11b.

[0025] The wider front region 11a of the central portion 11 is devised so as to allow the connection of the central portion 11 to the lateral portions 13, 14 near the front side 1a in the in-line roller skate frame made from the metal sheet 1. To this purpose, through-holes 17 for the passage of connecting and fastening means, which are arranged symmetrically with respect to the longitudinal axis L, are provided in said region 11a.

[0026] Correspondingly, respective through-holes 19, also provided for the passage of said connecting and fastening means, are made in the lateral portions 13, 15.

[0027] Figure 1A also shows a plurality of through-holes 5c, 5d, respectively provided near the lateral sides 1c, 1d, symmetrical with respect to the longitudinal axis L and intended for the passage of the wheel axles in the in-line roller skate frame made from the metal sheet 1. Said through-holes 5c, 5d are preferably provided equidistant from each other along said lateral sides 1c, 1d.

[0028] Furthermore, in Figure 1A a through-hole 7 provided in the front region 11a of the central portion 11 and a through-hole 9 provided in the rear region 11c of the central portion 11, near the rear side 1b, beyond the ends of the slits 3c, 3d, are shown. These holes 7, 9, which are aligned along the longitudinal axis L, are intended for the passage of the means for the connection to a boot in the in-line roller skate frame made from the metal sheet 1.

[0029] As it is evident from the above description and from Figure 1A, thanks to the presence of the longitudinal slits 3c, 3d, the central portion 11 of the metal sheet 1 is a strip that is partially separated from the lateral portions 13, 15 of the sheet itself, so that the front region 11a and the intermediate region 11b of said central portion 11 can be shaped at will independently from said lateral portions 13, 15 for obtaining an in-line roller skate frame.

[0030] With reference to Figure 1B, the central portion 11 is preferably shaped by bending downwards the intermediate region 11b, so that the front region 11a of the central portion 11 is at a height lower than the rear region 11c of said central portion.

[0031] Turning now to Figure 1C, the central portion 11 is further shaped by folding down of about 90° the lateral ends 11a', 11a" of the region 11a carrying the through-holes 17, so that they are substantially perpendicular to the rest of the central portion 11 and the through-holes 17 are oriented outwards.

[0032] In Figure 1D, the metal sheet 1 is shown after that the lateral portions 13, 15 have been folded downwards of about 90°, so as to be substantially perpendicular to the central portion 11.

[0033] The holes 19 provided in the lateral portions 13, 15 are thus aligned with the holes 17 provided in the front region 11a of the central portion 11, thus allowing the passage of connecting and fastening means 21, which rigidly fasten said lateral portions 13, 15 to said central portion 11 near the front side of the metal sheet 1.

[0034] These fastening means may be rivets 21, as shown in Figure 1D, bolts or the like.

[0035] Turning now to Figure 1E, the in-line roller skate frame obtained from the metal sheet 1 is shown.

[0036] The central portion 11 of said metal sheet forms the support for the skate boot.

[0037] More particularly, the front region 11a of the central portion 11 forms the platform for the toe of said shoe, while the rear region 11c of the central portion 11 forms the platform for the heel of said shoe.

[0038] As mentioned above, the through-holes 7, 9 respectively provided in the front and rear regions 11a, 11c allow the passage of the means for the connection to the skate boot. Advantageously, since the rear region 11c is at a height greater than the front region 11a, the boot is inclined forward, which increases the user's comfort during use.

[0039] The lateral portions 13, 15 of the metal sheet form instead the side wings of the frame.

[0040] As mentioned above, the holes 5c, 5d provided in the metal sheet 1 allow the passage of the axles of the skate in-line wheels.

[0041] It is evident from the above description that the invention achieves the object set forth above, since the in-line roller skate frame illustrated in Figure 1E, made from the metal sheet shown in Figures 1A - 1D, can be made in a wide variety of designs, while being simple and inexpensive to manufacture.

[0042] It is also clear that the above-described preferred embodiment is in no way to be considered as limiting and that many modifications and variants can be made without departing from the scope of protection of the invention as defined by the appended claims.

Claims

1. Metal sheet (1) for obtaining an in-line roller skate frame, said metal sheet having a substantially quadrilateral shape, comprising a front side (1a) and a rear side (1b), which are opposite and substantially parallel to each other, and a pair of lateral sides (1c, 1d), which are opposed and substantially parallel to each other and have a symmetrical shape with respect to a longitudinal axis (L) that is parallel to said lateral sides (1c, 1d) and divides said front and rear sides (1a, 1b) into substantially equal parts, **characterized in that** it comprises a pair of longitudinal slits (3c, 3d), starting from said front side (1a) and extending until near said rear side (1b), thus defining a central portion (11) and a pair of lateral portions (13, 15). 10
2. Metal sheet (1) according to claim 1, wherein said slits (3c, 3d) are symmetrical with respect to said longitudinal axis (L). 20
3. Metal sheet (1) according to claim 1 or 2, wherein said slits (3c, 3d) are shaped so that said central portion (11) includes a wider front region (11a), a narrower intermediate region (11b) and a rear region (11c) beyond the ends of said slits (3c, 3d). 25
4. Metal sheet (1) according to claim 3, wherein through-holes (17) are provided at the lateral ends (11a', 11a'') of said front region (11a) of said central portion (11), said through-holes being symmetrically arranged with respect to said longitudinal axis (L), and wherein respective through-holes (19) are correspondingly provided in said lateral portions (13, 15). 30 35
5. Metal sheet (1) according to claim 3, wherein through-holes (7, 9), aligned along said longitudinal axis (L), are provided in said front region (11a) and in said rear region (11c) of said central portion (11). 40
6. Metal sheet (1) according to any of the claims 1 to 5, wherein a plurality of through-holes (5c, 5d) are provided near said lateral sides (1c, 1d) respectively, said through-holes being arranged symmetrical with respect to said longitudinal axis (L) and preferably equidistant from each other. 45
7. Metal sheet (1) according to any of the claims 1 to 6, made of light metal, preferably aluminium. 50
8. In-line roller skate frame, comprising a central support, intended to support the skate boot and comprising a platform for the heel of said shoe and a platform for the toe of said shoe, and side wings, intended to carry the wheel axles of said skate, **characterized in that** it is obtained from a metal sheet (1) according to any of claims 1 to 7, whereby said 55
- central portion (11) of said metal sheet (1) forms said central support and said lateral portions (13, 15) of said metal sheet (1) form said side wings.
9. Method for obtaining an in-line roller skate frame from a metal sheet, **characterized in that** it comprises the following steps:
 - providing a metal sheet (1), having a substantially quadrilateral shape, comprising a front side (1a) and a rear side (1b), which are opposite and substantially parallel to each other, and a pair of lateral sides (1c, 1d), which are opposed and substantially parallel to each other and have a symmetrical shape with respect to a longitudinal axis (L) that is parallel to said lateral sides (1c, 1d) and divides said front and rear sides (1a, 1b) into substantially equal parts;
 - making in said metal sheet (1) a pair of longitudinal slits (3c, 3d), starting from said front side (1a) and extending until near said rear side (1b), thus defining a central portion (11) and a pair of lateral portions (13, 15) ;
 - bending downwards an intermediate region (11b) of said central portion (11), so that the front region (11a) of said central portion (11) near said front side (1a) is at a height lower than the rear region (11c) of said central portion (11) near said rear side (1b);
 - folding downwards the lateral ends (11a', 11a'') of said front region (11a) of said central portion (11) so that they are substantially perpendicular to said central portion (11);
 - folding downwards said lateral portions (13, 15) so that they are substantially perpendicular to said central portion (11);
 - fastening said lateral portions (13, 15) to said lateral ends (11a', 11a'') of said front region (11a) of said central portion (11).
10. Method according to claim 9, wherein said slits (3c, 3d) are shaped so as to give a substantially "T"-shaped structure to said central portion (11), so that the front region (11a) of said central portion is wider than said intermediate region (11b) of said central portion.
11. Method according to claim 9 or 10, wherein through-holes (17) are provided in said lateral ends (11a', 11a'') of said front region (11a) of said central portion (11) and wherein through-holes (19) are correspondingly provided in said lateral portions (13, 15), said through-holes (17, 19) being aligned to each other at the end of the folding steps.
12. Method according to any of the claims 9 to 11, further comprising the step of providing through-holes (7, 9) aligned along said longitudinal axis (L) in said front

region (11a) and in said rear region (11c) of said central portion (11).

- 13.** Method according to any of the claims 9 to 12, further comprising the step of providing a plurality of through-holes (5c, 5d), symmetrical with respect to said longitudinal axis (L) and preferably equidistant from each other, in said lateral portions (13, 15), near said lateral sides (1c, 1d).

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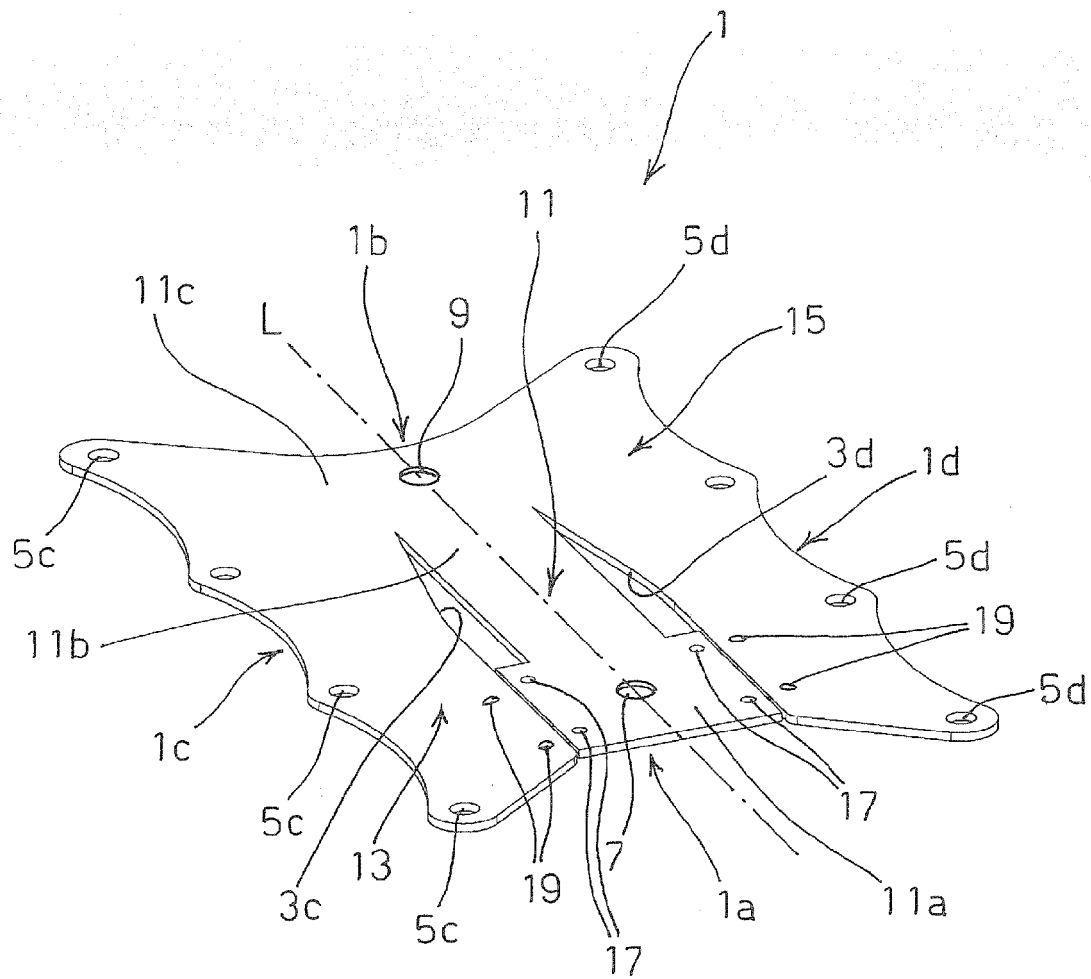


FIG. 1A

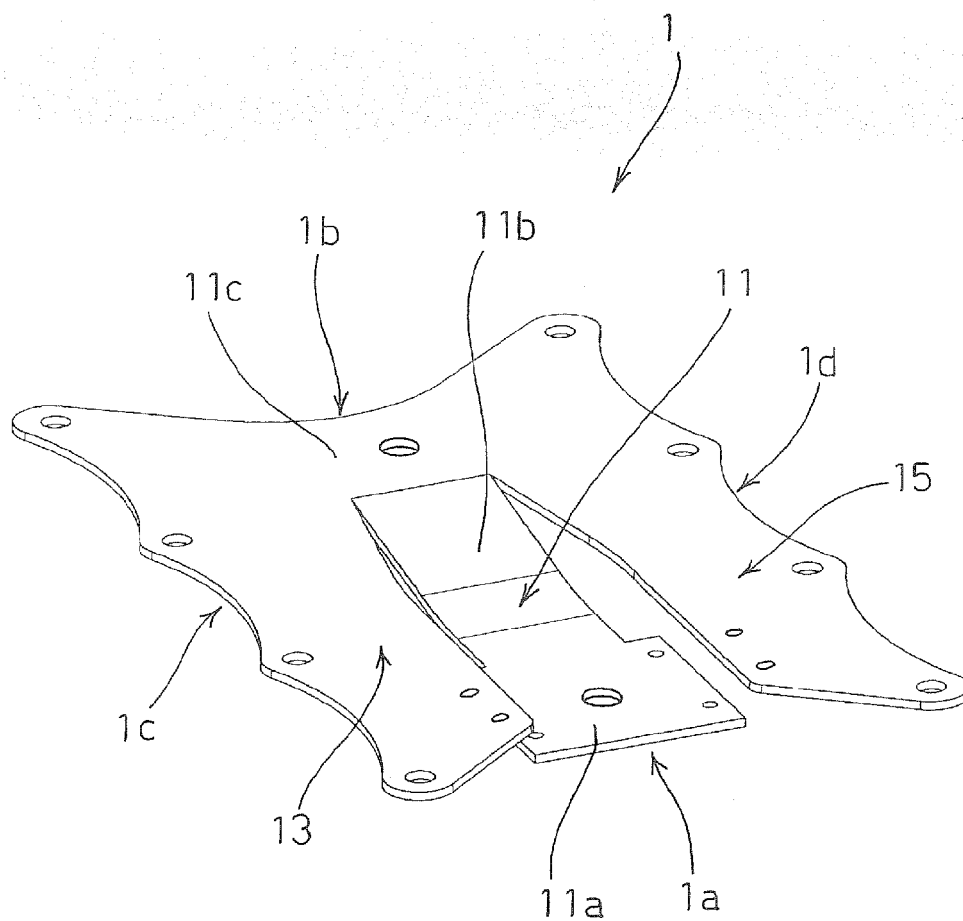


FIG. 1B

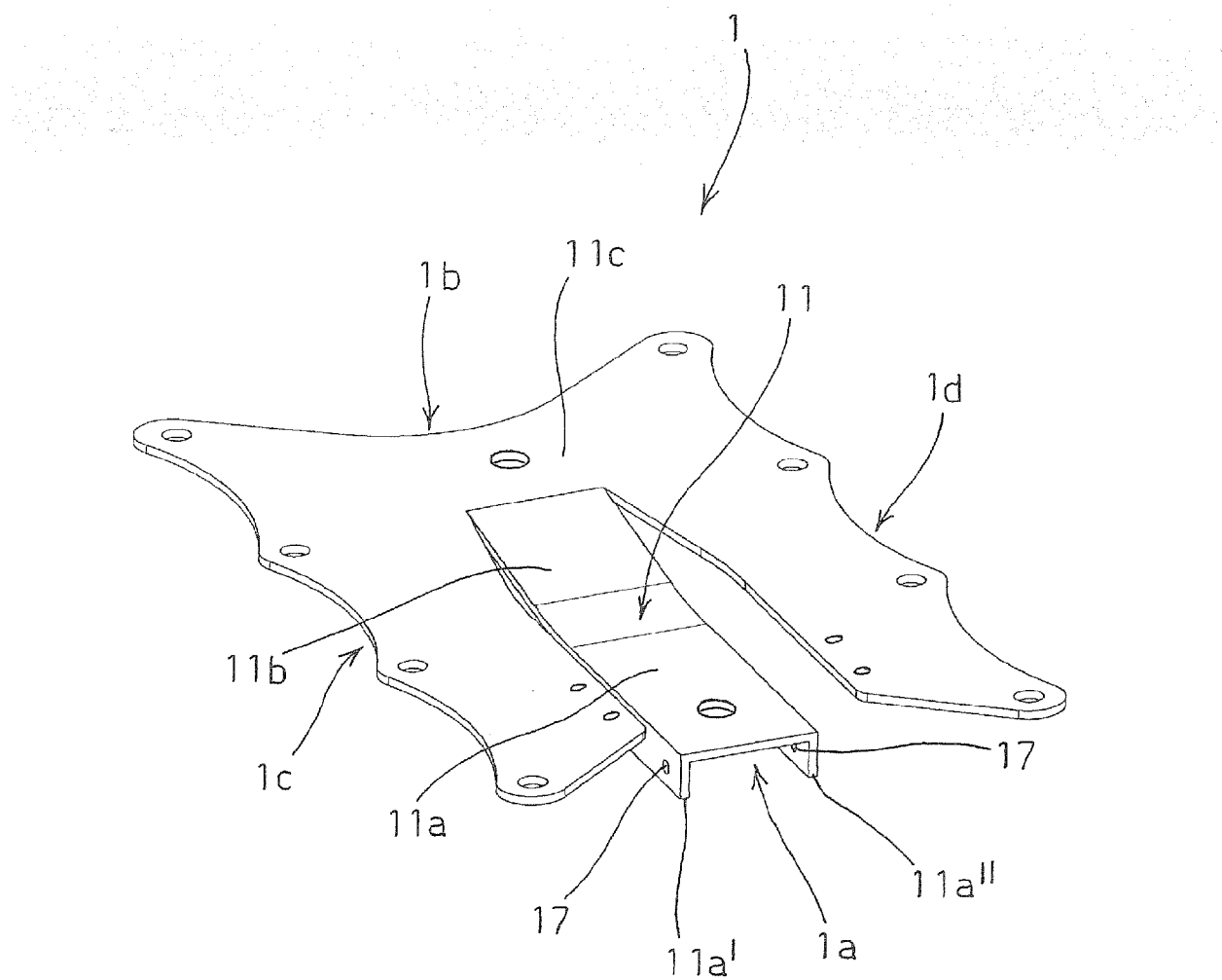


FIG. 1C

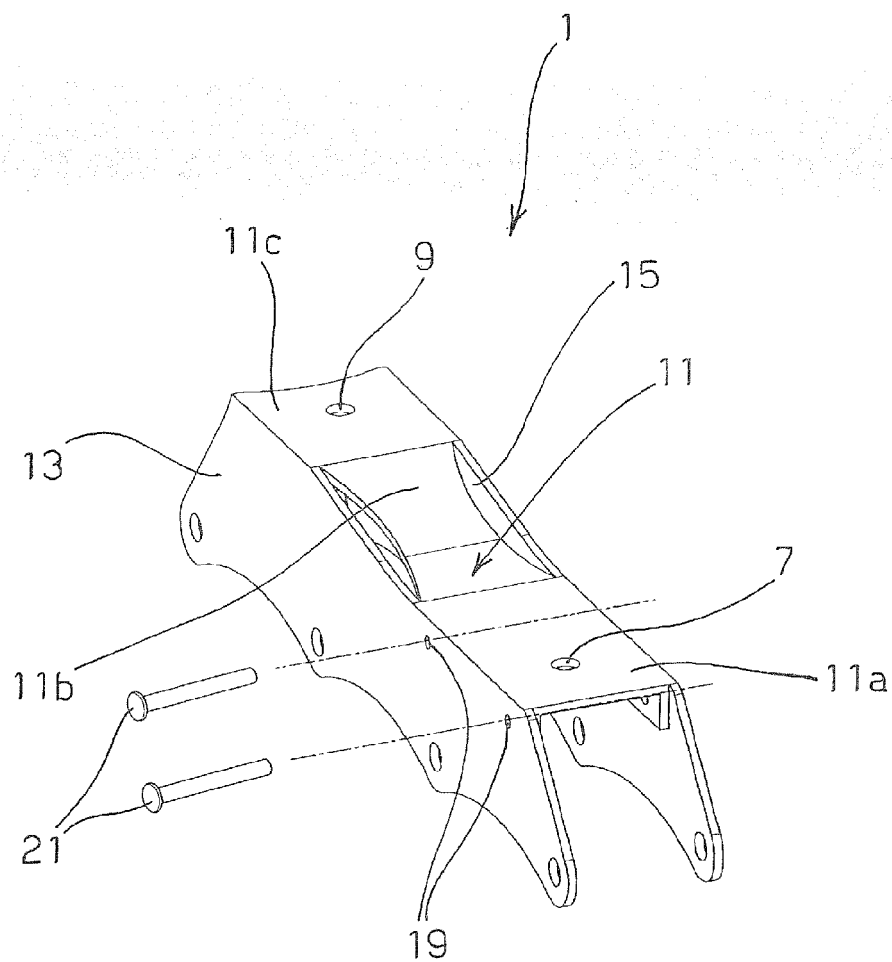


FIG. 1D

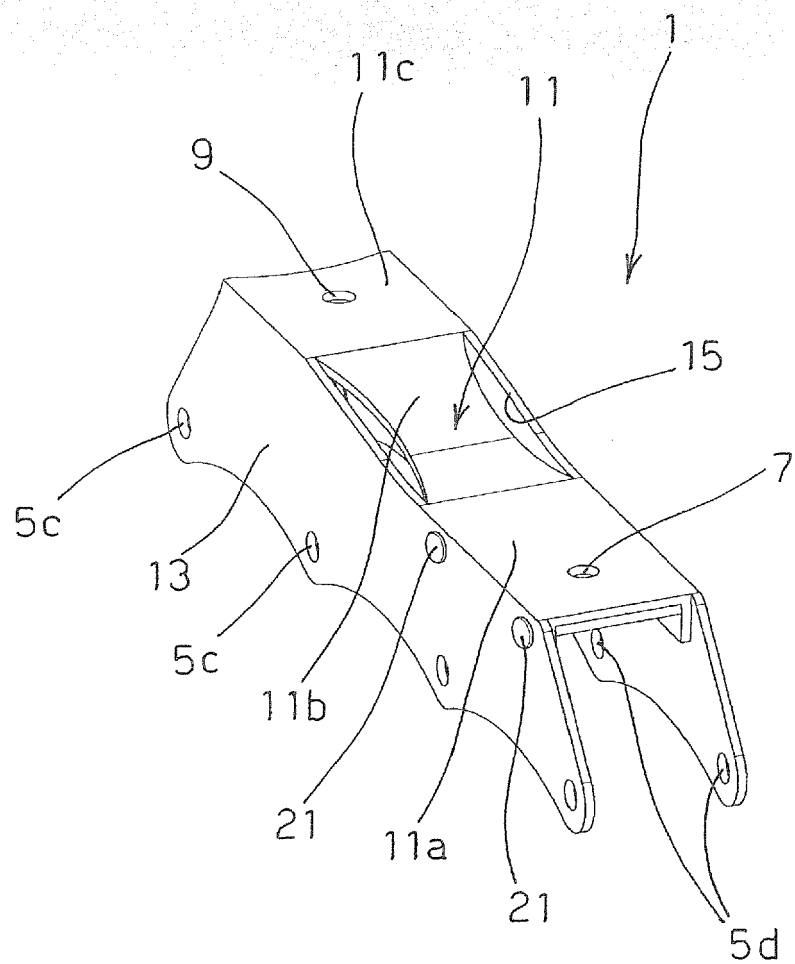


FIG. 1E



EUROPEAN SEARCH REPORT

Application Number
EP 11 16 0812

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	EP 2 105 173 A1 (NORDICA SPA [IT]) 30 September 2009 (2009-09-30) * the whole document *	1-13	INV. A63C17/06
A	US 2009/256322 A1 (WAN FONG-CHOU [TW]) 15 October 2009 (2009-10-15) * the whole document *	1-13	
A	EP 0 043 250 A1 (MURRY LIONEL LOUIS) 6 January 1982 (1982-01-06) * the whole document *	1-13	
A	US 6 042 124 A (CHEATHAM JAMES F [US] ET AL) 28 March 2000 (2000-03-28) * the whole document *	1-13	
			TECHNICAL FIELDS SEARCHED (IPC)
			A63C
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 18 July 2011	Examiner Haller, E
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**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 11 16 0812

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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18-07-2011

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