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(54) **A climbing product step**

(57) A climbing product step forming a generally planar horizontal treading surface to support the feet of a human standing on said step, said step having main body of a wooden board with a front, a rear, a treading surface and a bottom, wherein the treading surface and the bottom are at least substantially planar and substantially parallel to each other

A metal member is fitted to said main body, said metal member including a metal plate portion extending underneath the bottom of the main body and said metal member including multiple raised metal anti-slip portions, said anti-slip portion extending upward from the metal plate portion through corresponding openings in the main body, said anti-slip portions having a top end that protrudes upward from the treading surface of the main body.

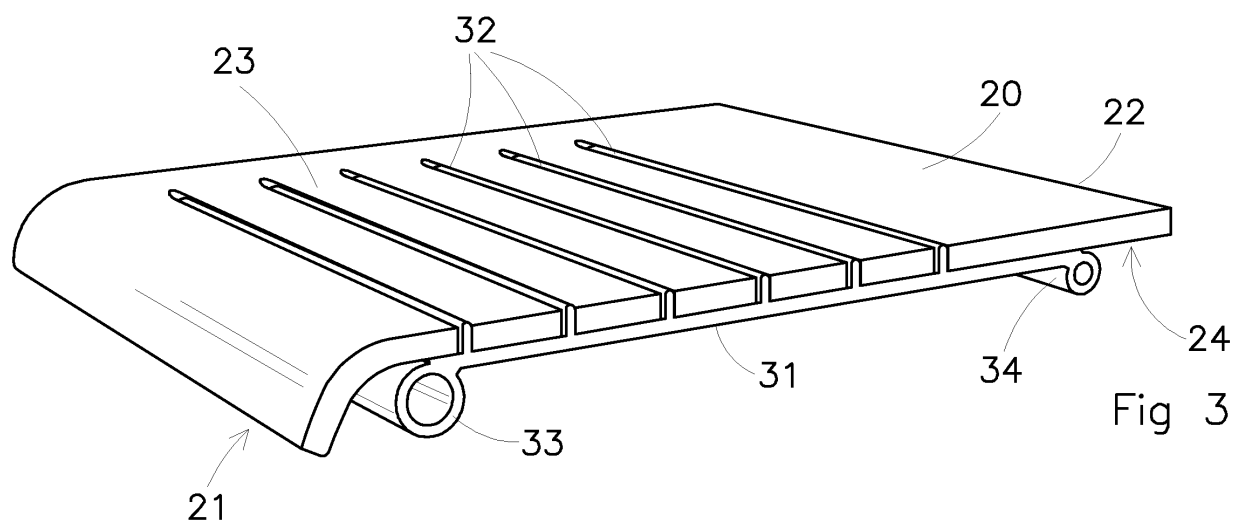


Fig 3

Description

[0001] The present invention relates to a climbing product step forming a generally planar horizontal treading surface to support the feet of a person standing on said step.

[0002] From the prior art climbing products are known with one or more steps, wherein the generally planar horizontal treading surface to support the feet of a human person standing on a step is formed by a wooden board with a front, a rear, a treading surface and a bottom, wherein the treading surface and the bottom are at least substantially planar and substantially parallel to each other. The wood can be solid wood, but often a multilayer board is employed.

[0003] For staircases the use of wooden boards for the steps, also referred to as treads, is quite common. For other climbing products, such as step stools, the use of wooden boards for the steps is less well known.

[0004] For climbing products it is desired to provide anti-slip measure to increase the grip of the feet of the person on the step.

[0005] For a wooden board step stability is another issue of relevance, in particular when it is desired to avoid an undue thickness of the wooden board, e.g. for weight and/or aesthetic reasons. E.g. when the climbing product is a portable climbing product, the weight is of relevance.

[0006] The present invention provides a climbing product step forming a generally planar horizontal treading surface to support the feet of a human person standing on said step, said step having main body of a wooden board with a front, a rear, a treading surface and a bottom, wherein the treading surface and the bottom are substantially planar and substantially parallel to each other. According to the invention a metal member is fitted to said main body, said metal member including a metal plate portion extending underneath the bottom of the main body and said metal member including multiple raised metal anti-slip portions, said anti-slip portion extending upward from the metal plate portion through corresponding openings in the main body, said anti-slip portions having a top end that protrudes upward from the treading surface of the main body.

[0007] In a preferred embodiment the front of the main body is curved downwardly.

[0008] In a preferred embodiment the wooden board is made of plywood, which is advantageous in combination with the optional feature that the front of the main body is curved downwardly.

[0009] In a preferred embodiment the main body is provided with a generally transparent coating permitting the natural appearance of the wood to be displayed through the coating.

[0010] The present invention also relates to a climbing product provided with one or more step according to the invention, e.g. the climbing product being a portable climbing product.

[0011] The climbing product is in a preferred embodi-

ment a step stool, most preferably a folding step stool.

[0012] Further preferred details of the step and climbing product according to the invention are mentioned in the subclaims and will be explained in the description of a preferred embodiment.

[0013] In the drawings:

Fig. 1 shows schematically an example of a folding step stool with one or more steps according to the invention,

Fig. 2 shows a half of a step of the step stool in a perspective view from above,

Fig. 3 shows the half of the step in a perspective view from another angle, and

Fig. 4 shows the half of the step in side view.

[0014] A preferred embodiment of the step and a step stool according to the invention will now be explained referring to the figures.

[0015] In figure 1 an example of step stool is shown having a folding frame with a pair of front legs 2a, 2b and a pair of rear legs 3a, 3b. The rear legs are coupled to the front legs at an elevated position, via hinges 4a, b, so that the front and rear legs are relatively pivotable between an opened use position, wherein the front and rear legs in general define an A in side view of the step stool, and a collapsed storage position, wherein the front and rear legs are essentially parallel.

[0016] This step stool includes an upper step 10 and in this example two lower steps 11, 12, each step 10,11,12 being arranged between and coupled to the front legs 2a,b for pivotable movement between a horizontal use position and a storage position, each step being adapted to support a person thereon. Obviously the step stool may have another number of steps. In another example the step stool is not foldable and has a rigid frame accommodating one or more steps.

[0017] In this example the front legs are interconnected at spaced positions by pivot shafts 2c which each rotatably support the front portion of a step.

[0018] In this example the legs 2a, b are here connected by a hoop portion at their upper ends.

[0019] As is common in folding step stools a linkage member arrangement is provided, which effects simultaneous movement of the steps 10-12 as the frame is folded to move between the use position and the collapsed position. Here the linkage member arrangement includes one or more linkage members 7 extending between the rear legs on the one hand and a step (here step 11) on the other hand, each linkage member 7 being hinged at its ends. Furthermore one or more linkage members 8 extend between the steps 11,12,13, each connection being pivotal. Upon collapse of the step stool the steps 10-12 are tilted to their vertical or storage position, here essentially parallel to the plane of the front legs.

[0020] The frame here includes a crossbar 9 extending between the rear legs 2a,b and arranged so that a rear portion of the upper step 10 rests on said crossbar 9

when said upper step 10 is in its use position. A further crossbar 9b is fitted in this example at a lower level between the rear legs.

[0021] The upper step 10 is in this example provided with a manually releasable latch mechanism, e.g. including a pivotal latch member (not shown), that is arranged to catch under or onto the crossbar 9, the legs or other part of the step stool, when the frame is folded to its use position so as to retain the step stool 1 in the use position. In another design of the step stool a releasable latch mechanism to retain the step stool in use position may have another design and/or location.

[0022] The pivotal latch member is operable manually by a user to disengage the latch member and to fold the frame to the storage position. Due to the linkage member arrangement the motion of the upper step 10 simultaneously causes the frame to fold and all other steps to move towards their storage position.

[0023] A preferred embodiment of a step, in this example step 12, of the step stool 1 will now be discussed in more detail referring to the figures 2-4. It is noted that said figures only show the left-hand half portion of the step, the right-hand half portion being symmetrical to the left-hand half portion.

[0024] The step 12 has a generally planar horizontal treading surface to support the feet of a human person standing on said step. The step has a main body 20 formed by a wooden board with a front 21, a rear 22, a treading surface 23 and a bottom 24, wherein the treading surface and the bottom are at least substantially planar and substantially parallel to each other.

[0025] The wooden board 20 here is made of plywood, as is preferred, and here, as is also preferred, includes a curved downward front portion at the front 21.

[0026] A metal member 30 is fitted to said main body 20, said metal member 30 including a metal plate portion 31 extending underneath the bottom 24 of the main body 20 and said metal member including multiple raised metal anti-slip portions 32.

[0027] The metal member 30 can be fastened to the main body in any suitable manner, e.g. by one or more screws or bolts, or even by adhesive as may be preferred.

[0028] The anti-slip portions 32 extend upward from the metal plate portion 31 through corresponding openings 25 in the main body 20. The anti-slip portions 32 have a top end that protrudes above the treading surface of the main body, so that the feet, or footwear, of the person standing on the step have extra grip on the step. Here the top end of each portion 32 is straight, but the top end may also have other configurations, e.g. undulating.

[0029] The openings 25 in the main body can be made to receive the anti-slip portions 32 with some play between the sides of the portions and the main body in order to facilitate the manufacturing of the step.

[0030] As is preferred the metal member is a monolithic member, more preferably an extruded metal member, most preferably an extruded aluminium member as in

this example. A cast metal member can also be envisaged.

[0031] The multiple raised anti-slip portions 32 here are elongated strip portions, in this example straight and parallel strip portions formed during the extrusion process of the member 30. Obviously the openings 25 here also a straight openings, e.g. formed by milling parallel straight slots through the wooden board 20.

[0032] As is preferred the anti-slip portions 32 extend transverse across the step, i.e. parallel to the front of the step.

[0033] The anti slip portions preferably protrude between 1 and 5 millimetres above the treading surface.

[0034] As is preferred the strip portions 32 have a width between 2 and 6 millimetres.

[0035] If any, a possible gap between the body 20 and the anti-slip portions may be filled when desired with a (transparent) filler, e.g. a resin.

[0036] It will be appreciated that the shape of the anti-slip portions may be different than shown here, e.g. with wave-like strips (e.g. parallel), with semi-circular or U- or V-shaped anti-slip portions, etc. With more complex shapes, e.g. non-extrudable shapes, it may be preferred to form the metal member 30 as a (aluminium) cast member, possible machining operations (e.g. drilling, milling) being performed for detailing the anti-slip portions and/or other portions of the metal member.

[0037] For fastening the step to the climbing product, here the step stool, the metal member 30 includes one of more fastening portions, in this example embodied as hinge portions for hinging the step to the step stool or part(s) thereof.

[0038] In this example the metal member 30 includes a first hinge portion 33 at the side of the front of the main body and a second hinge portion 34 at the side of the rear of the main body. The first hinge portion 33 here is adapted to receive a pivot shaft 2c of the frame, whereas the rear hinge portion here is adapted to connect to one or more linkage members 8 of the step stool.

[0039] As is preferred, in particular for an extruded member 30, the one or more hinge or fastening portions are formed as a tubular portion integral with the plate portion. Preferably when the anti-slip portions 32 are straight and parallel strips, the one or more tubular portions extend parallel to said anti-slip portions so as to allow their formation during the extrusion process. Obviously other extruded formations parallel to the anti-slip portions can also be envisaged.

[0040] The one or more extruded hinge portions can be machined when desired, e.g. to change the effective length of the hinge portions, e.g. to create two aligned hinge portions at a side of the metal plate.

[0041] In a plywood or other wooden version of the step main body it is possible to provide the main body is provided with a generally transparent coating permitting the natural appearance of the wood to be displayed through the coating. On the other hand a colored paint can also be envisaged in combination with a wooden

main body.

[0042] It is envisaged that the frame of the step stool can be of metal or wood, e.g. plywood.

[0043] As in the art the step stool is preferably portable so that a user can carry the step stool. In another embodiment the step stool may comprise wheels.

[0044] It is also envisaged that the step according to the invention can be employed in other climbing products, e.g. a ladder, a loft-ladder, etc.

[0045] The climbing product may also be a stair in a building.

Claims

1. A climbing product step (12) forming a horizontal treading surface to support the feet of a person standing on said step, said step having main body (20) of a wooden board with a front (21), a rear (22), a treading surface (23) and a bottom (24), wherein the treading surface and the bottom are substantially planar and substantially parallel to each other, wherein a metal member (30) is fitted to said main body, said metal member including a metal plate portion (31) extending underneath the bottom of the main body and said metal member including multiple raised metal anti-slip portions (32), said anti-slip portions extending upward from the metal plate portion through corresponding openings (25) in the main body, said anti-slip portions (32) having a top end that protrudes above the treading surface of the main body.
2. A climbing product step according to claim 1, wherein the metal member (30) is a monolithic member.
3. A climbing product step according to claim 1 or 2, wherein the metal member (30) is an extruded metal member, preferably an extruded aluminium member.
4. A climbing product step according to one or more of the preceding claims, wherein the multiple raised anti-slip portions (32) are elongated strip portions.
5. A climbing product step according to claim 4, wherein the elongated strip portions (32) are parallel strip portions, e.g. wherein the elongated strip portions are straight, e.g. substantially parallel to the front of the step.
6. A climbing product step according to one or more of the preceding claims, wherein the anti-slip portions (32) protrude between 1 and 5 millimetres above the treading surface.
7. A climbing product step according to claim 5, wherein the strip portions (32) have a width between 2 and

5 millimetres.

8. A climbing product step according to one or more of the preceding claims, wherein the metal member (30) includes one of more fastening portions adapted to fasten the step to the climbing product.
9. A climbing product step according to claim 8, wherein the metal member (30) includes one or more hinge portions (33, 34) adapted to hinge the step to the climbing product.
10. A climbing product step according to claim 9, wherein the metal member includes a first hinge portion (33) at the side of the front of the main body (20) and a second hinge portion (34) at the side of the rear of the main body (20).
11. A climbing product step according to claim 9 or 10, wherein each hinge portion (33, 34) is formed as a tubular portion integral with the plate portion (30).
12. A step stool including a step according to one or more of the preceding claims 1-11.
13. A step stool according to claim 12, comprising:
 - a folding frame having a pair of front legs (2a, b) and a pair of rear legs (3a,b), said rear legs being coupled to the front legs for pivotable movement between an opened use position and a collapsed storage position,
 - an upper step (10) and one or more lower steps (11,12), each step (10,11,12) being arranged between and coupled to the front legs (2a,b) for pivotable movement between a horizontal use position and a storage position,
 - a linkage member arrangement (7, 8) effecting simultaneous movement of the steps (10-12) as the frame is folded to move between the use position and storage position,
 wherein at least one of the steps (12) is embodied according to one or more of the claims 1-11.
14. A step stool according to claim 13, wherein the frame comprises a crossbar (9) extending between the rear legs (3a,b) and arranged so that a rear portion of the upper step (10) rests on said crossbar (9) when said upper step is in its use position, the upper step (10) being provided with a manually releasable latch mechanism including a latch member (20) having a latch face (20a) that is arranged to catch under said crossbar (9) when the frame is folded to its use position so as to retain the step stool in said use position, the latch member (20) being operable manually by a user to disengage the latch member (20) from the

crossbar (9) and fold the frame to the storage position.

15. A staircase including a step according to one or more of the preceding claims 1-11.

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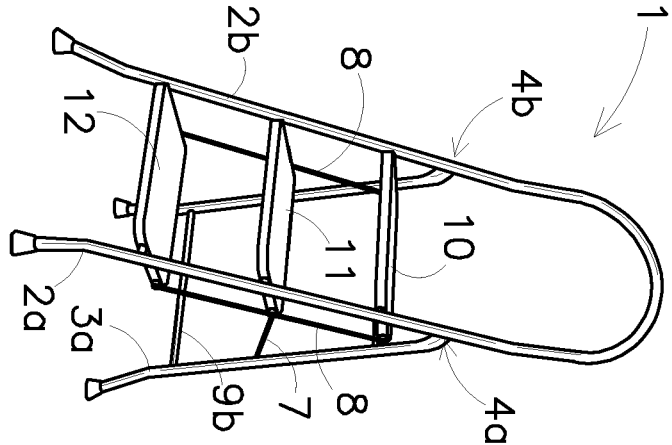


Fig 1

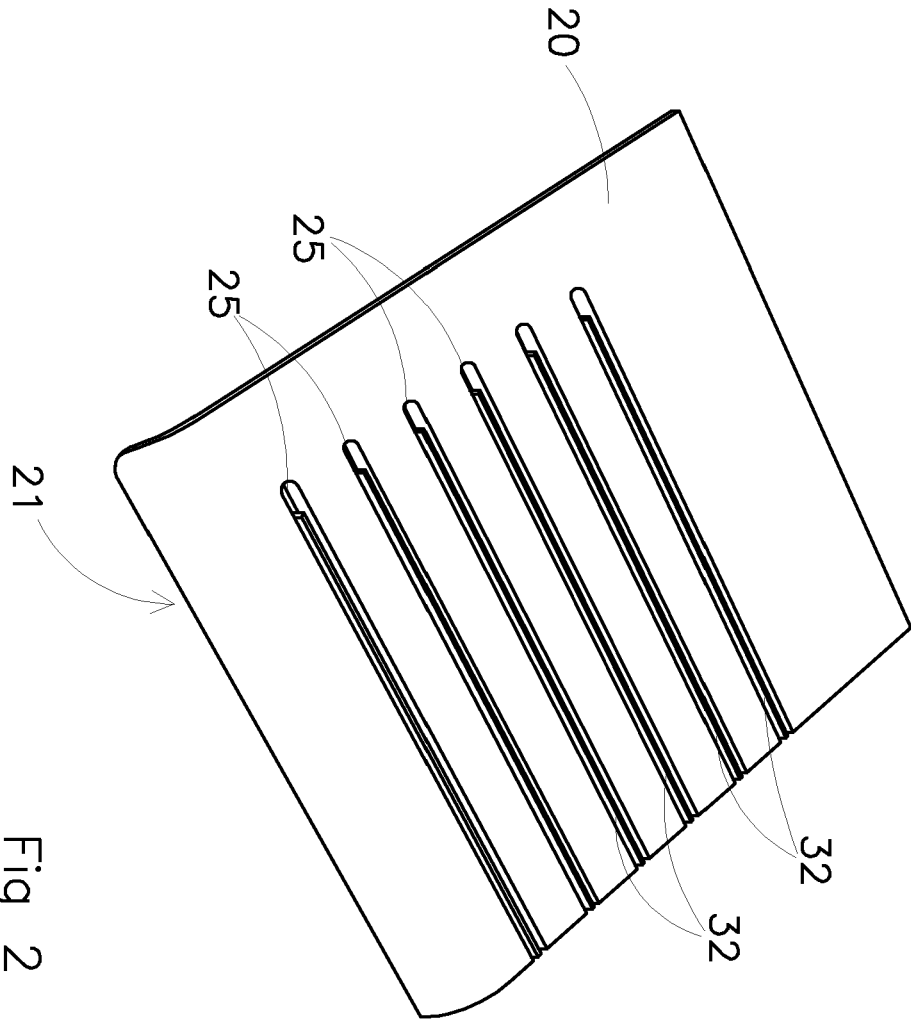
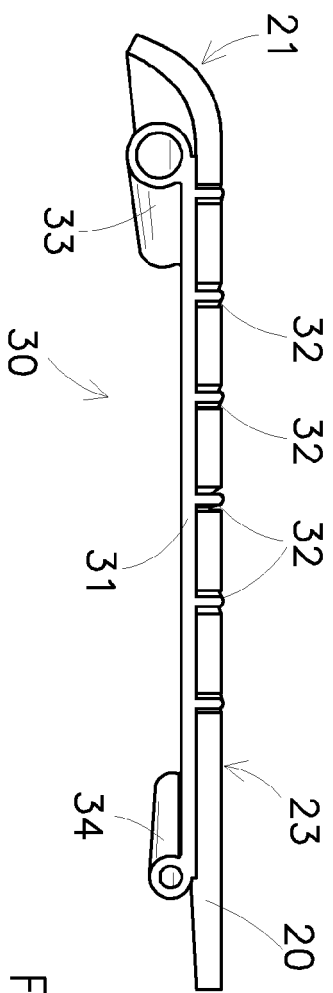
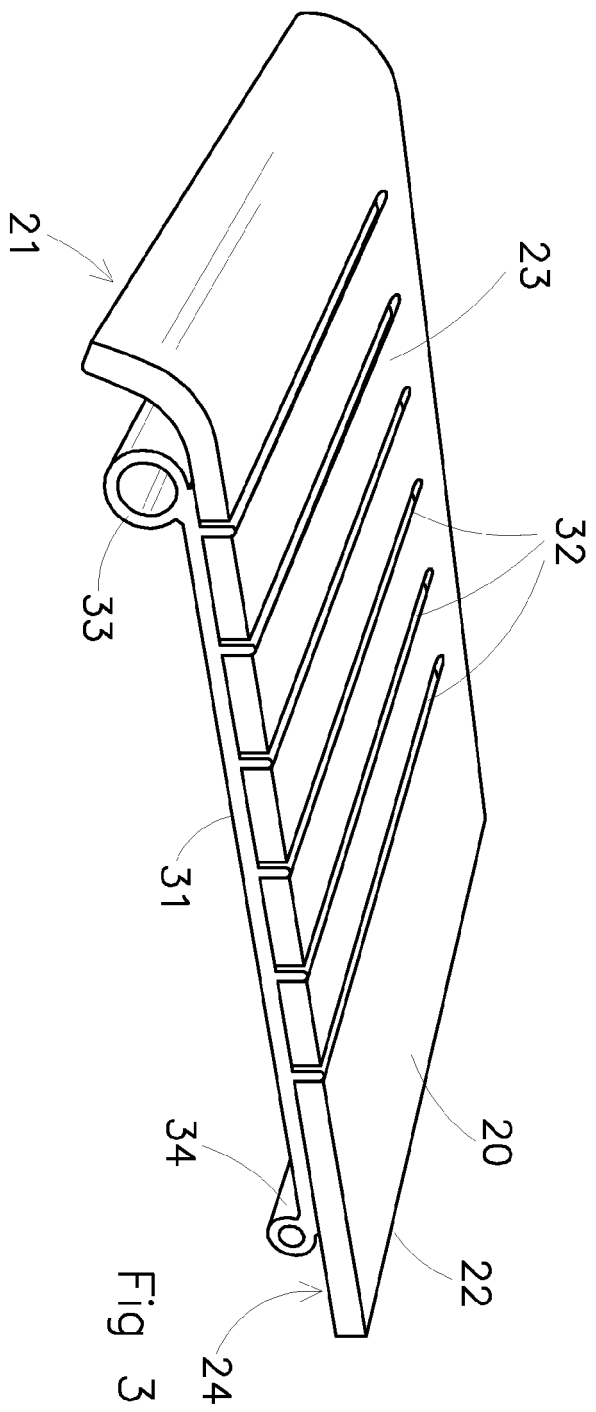


Fig 2





EUROPEAN SEARCH REPORT

Application Number
EP 09 16 8601

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The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (IPC) E06C E04F A47C
Place of search		Date of completion of the search	Examiner
The Hague		26 November 2009	Demeester, Jan
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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EPO FORM 1503 03.02 (P04/C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 09 16 8601

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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26-11-2009

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