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(54) **ASSEMBLY WITH COMBINED SUPPORT ELEMENT AND LADDER**

(57) An assembly (MC) is described constituted by a flat support element (20) and a ladder (10) with at least one peg (14), wherein the support element comprises a flat surface (22) and a seat (28) engageable when needed by the peg so that the support element remains integral with the ladder and thus allows the leaning of an object. The peg has circular cross-section and the seat

(28) has a shape substantially complementary to the peg and such that it can engage it, and the support element comprises a second seat (30) engageable by a transverse bar (38) adapted to abut against the sides of the ladder and prevent a relative rotation of the seat with respect to the peg.

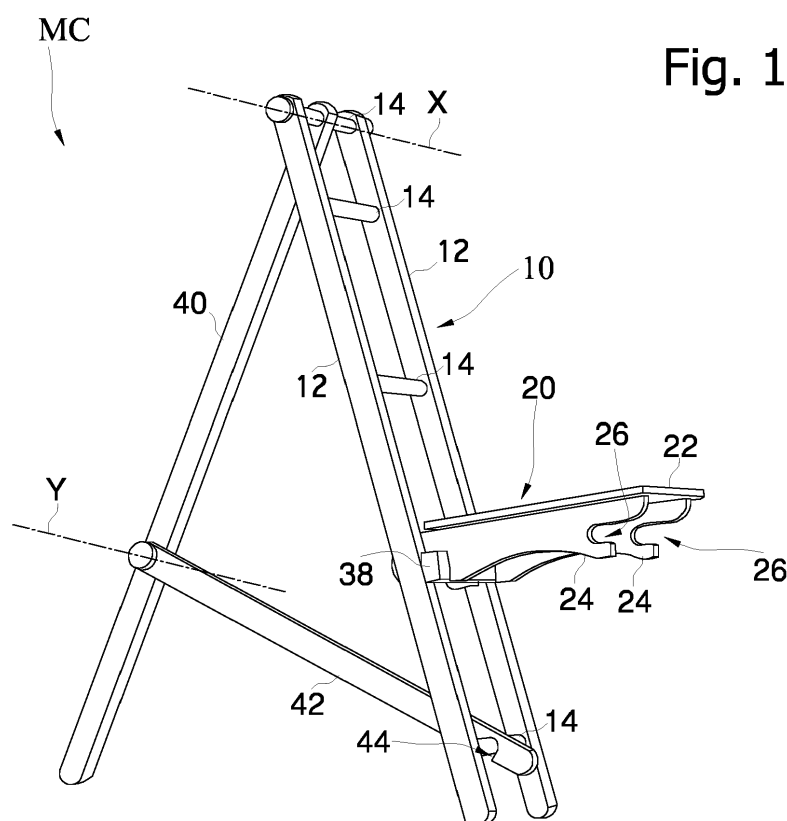


Fig. 1

Description

[0001] The invention relates to an assembly consisting of a support element and a ladder combinable with each other, in particular for sitting or supporting an object.

[0002] The advantage of having a chair and a ladder in the same tool is evident. Especially in small houses, or during outdoor activities such as camping or hiking, space and/or weight optimization is the primary requirement. Besides, the steps of the ladder are exploited to dispose the support at various heights.

[0003] Some structural integration attempts are visible e.g. in the documents DE2610264, US2007256891, US4250977 and GB2123888. All have in common specific mechanisms adapted to transform the chair into a ladder, or vice versa, or to reduce the overall dimensions.

[0004] The last three documents use a stepped ladder, therefore the tool's depth is compressible to a limited extent, and the weight is considerable enough to prevent the prolonged transport on the shoulders.

[0005] In document DE2610264 the ladder 2, 3 is not orthogonal with respect to the support 8 mounted horizontally on a peg, thereby cluttering a lot, and there is the problem of transporting or storing the support 8 without losing it and of associating it to the ladder in some way. Moreover, the weight of the support 8 is countered by a bar 18 leaning on a lower rung, which complicates and makes heavy the structure and prevents to place the support 8 on the lowest rung.

[0006] Therefore an assembly is missing, consisting of a support element combined/combinable with a ladder, which is of simple construction, small size and easily storable and transportable.

[0007] The main object of the invention is precisely to propose an assembly of the aforementioned kind which has one or more of these advantageous characteristics.

[0008] An assembly is proposed constituted by a flat support element and a ladder with at least one peg, wherein the support element comprises a flat surface and a seat engageable when needed by the peg so that the support element remains integral with the ladder and thus allows the leaning of an object, wherein the seat has a form (i) substantially complementary to the peg and (ii) such that it can engage it, and the support element comprises a transverse bar adapted to abut against the sides of the ladder and prevent a relative rotation of the seat (and therefore of the support element) with respect to the peg.

[0009] The combined action of the engagement to any peg and of the blockage caused by the transverse bar allows not only a stable positioning for the flat support element but also to be able to easily choose the height (i.e. the peg) at which to put it along the ladder.

[0010] Preferably, for simplicity of construction, the peg has a circular cross-section (especially if it is made of wood).

[0011] Such cross-section may also be different, e.g. square or rectangular, if the peg or the assembly is made

out of metal, e.g. by cutting it from extruded bars, e.g. of aluminum.

[0012] The transverse bar may be fixed on the support element or, mounted when needed, by limiting the overall dimensions and allowing greater ease of transport to the support element. In such case the support element may comprise a second seat engageable by the transverse bar.

[0013] Preferably, in the assembly the first and the second seats are both comprised in a continuous shaping of the support element, to simplify the construction and the lock/unlock manoeuvre.

[0014] Preferably the first seat has a U- or L-shaped form, with a concavity oriented along a direction substantially parallel to the flat surface. Therefore it is simple to build and to mount on a peg, and the support element can be fixed parallelly to the ladder for transport.

[0015] Preferably the assembly, or the support element, comprises a third seat which is as spaced from the first, in a direction parallel to the flat surface, as about the separation between two pegs, and adapted to fittingly receive a peg. This has the advantage that the support element can be fixed parallel to the ladder for the transport at two ends.

[0016] Preferably in the assembly the third seat has U- or L-shaped form, with a concavity oriented along the same direction substantially parallel to the flat surface of the first seat.

[0017] Preferably in the assembly the support element comprises an element protruding orthogonally from the flat surface, the seats being formed in the protruding element.

[0018] The advantage is to be able to build the support element with separate components, easily machinable and without shaping one single piece. By fixing to the support element two equal elements projecting as defined above and by placing them parallel to each other the fixing stability can be increased.

[0019] Preferably the assembly comprises a bar that is hinged at one end of the ladder and has length approximately equal to the latter. The bar can thus form an adjustable, third point of support on the ground thereby improving the balance of the assembly.

[0020] Preferably to the bar there is hinged an arm adapted to joint in a non-permanent manner with a peg, so as to bind the ladder and the bar to each other.

[0021] Preferably the assembly comprises a wheel mounted at one end of the ladder, to transport it more comfortably.

[0022] The assembly can be transported or be associated with a rucksack, also forming a kit of parts.

[0023] The advantages of the invention will be more apparent from the following description of a preferred embodiment of assembly, making reference to the attached drawing wherein

Fig. 1 shows a three dimensional view of an assembly;

Fig. 2 shows a view from below of a component of the assembly of Fig. 1;

Fig. 3 shows in cross-section a detail of the assembly of Fig. 1.

[0024] In the figures identical numbers indicate identical or conceptually similar parts, and the assembly is described as in use.

[0025] In Fig. 1 an assembly MC is shown formed by a flat support element 20 mountable on a ladder 10. The ladder 10 comprises two equal bars 12 separated and made integral by five pegs 14 (but the number of pegs may vary). All or some of the pegs 14 (four in the example) are equally spaced, but this is not essential.

[0026] On a peg 14 the support 20 can be temporarily mounted steadily.

[0027] The support 20 comprises a flat portion 22, which acts e.g. as a seat or shelf, from which two flaps or walls 24 parallel to each other protrude orthogonally. On the flaps 24 are formed shaped portions which define a first seat 28 engageable when needed by a peg 14, a second seat 30 and a third seat 26.

[0028] The seats 30, 28, 26 are obtained as shaping of, or grooves in, a flap 24, and they develop as a mirror image on each of the flaps 24, which therefore are almost equal to each other.

[0029] The seat 28 is for example a U- or L-shaped cavity, to form a sort of hook or grapple with which to couple the support 20 to a peg 14. That is, a peg 14 can engage snugly the seat 28 when the support 20 is mounted on the ladder 10. In particular, the seat 28 is formed by a concavity directed along a direction W (Fig. 2) substantially parallel to the lying plane of the flat surface of portion 22.

[0030] The second seat 30 is contiguous to the first seat 28, and preferably it is an extension thereof. Thus both seats 28, 30 may be obtained as the formation, and consist, of a cavity along the profile of the flap 24. Preferably, the seat 30 comprises a dihedral angle, to ensure better fastening stability (see below).

[0031] The third seat 26 is spaced from the first seat 28, along the direction W, as approximately the separation between two pegs 14, and it is adapted to receive snugly a peg 14 as well. Preferably also the third seat 26 has the form of U- or L-shaped cavity, and has a concavity directed along the direction W in the same orientation of the seat 30. In other words the mouths of the seats 30, 26 are facing the same side.

[0032] As seen from the figures, the flaps 24 may be constituted by a nearly-parallelpiped tablet, fixed on one side thereof along the portion 22. From one short side of the tablet a portion is removed about as wide as a peg 14, so as to form a recess, preferably with a bottom of circular or arcuate cross-section, corresponding to the seat 26. On the long free side, at the opposite end with respect to the seat 26 just obtained, a portion made approximately as an "L" is removed, so as to form the two seats 28, 30. The seat 28 is thus an undercut inside which

a peg 14 can be housed by inserting it through the seat 30.

OPERATION

[0033] To make the support 20 integral with the ladder and thus enable the support of an object or the sitting on it, it is enough to engage one peg 14 inside the seat 28 (see the configuration in FIG. 3). To do this, it is sufficient to insert the peg 14 in the seat 30 and then move the support 20.

[0034] This maneuver binds the support 20 to the ladder, and to block the fall thereof and sustain the weight of the object, a catch 38 (e.g. a simple stick or bar) is wedged inside the seat 30. The catch 38 is arranged transversely on the bars 12 and pushes on them thereby preventing itself from turning downwards. The reaction force of the peg 14 against the seat 28, and the optional but preferred shape complementarity between the catch 28's cross-section and that of the seat 30 (in particular of its dihedral angle), ensures the stability of the mating. In practice, the support 20 remains pivoted on a peg 14 and the catch 38, by interlocking into the seat 30, locks it into place.

[0035] When the support 20 no longer serves as a support surface, the catch 38 is lifted and the peg 14 is removed from the seat 30 by moving backwards the support 20. To maintain orderly and safely the support 20, it can be arranged between two pegs 14 and slid parallel to the bars 12, so that for two consecutive pegs one enter in the seat 30 and one in the seat 26. Thus the support 20 remains connected to the two pegs and can be transported together with the ladder 10 without getting loose. Preferably, therefore, at least two pegs 14 are distant from each other along W as are the seats 30, 26.

VERSIONS

[0036] The assembly MC can advantageously be transported with ease, e.g. in the case it is associated with a rucksack. It is understood that the ladder 10, when it sustains the support 20 between two pegs 14, is of little encumbrance. It is just enough to fasten it to a rucksack, preferably by exploiting his all-flat shape to constitute the back of the rucksack, to carry it comfortably. And the rucksack receives the advantages of being stiffer on the back and, for example, of making it breathe better.

[0037] As another variant the assembly MC may comprise a bar 40, which is hinged about an axis X (horizontal in use) at one end of the ladder 10 (e.g. around a peg 14) and has a length approximately equal to the ladder 10. This hinging may be permanent (bar 40 permanently connected to the ladder 10) or temporary (bar 40 detachable from the ladder 10). The function of the bar 40 is to create a third support point for the ladder 10, turning the assembly MC into a tripod and avoiding that it falls (fig. 1).

[0038] Preferably, to the bar 40 there is hinged, around an axis Y parallel to the axis X, an arm 42 adapted, e.g. by a notch or seat or step 44, to get stuck in a non-per-

manent manner on a peg 14. The function is to set the angle of divergence between the ladder 10 and the bar 40. Advantageously, the arm 42 may extend up to touch ground, forming a further support point for the assembly and/or acting as a counterweight to what is resting on the support 20.

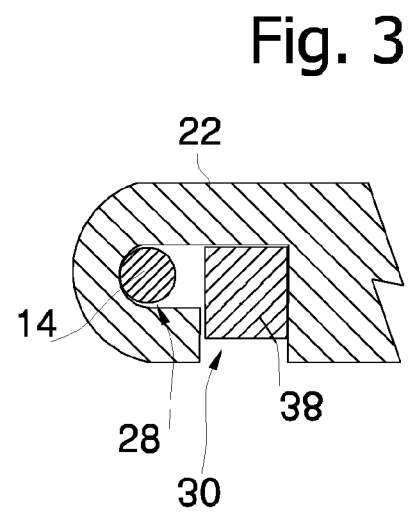
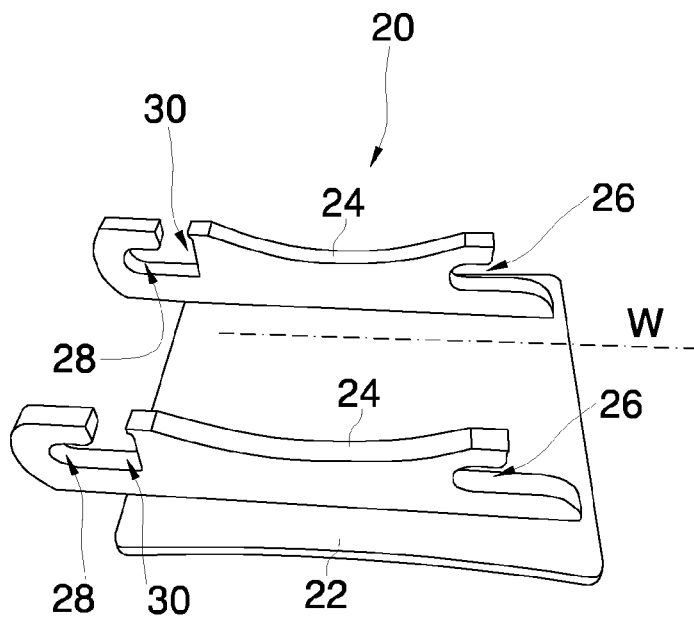
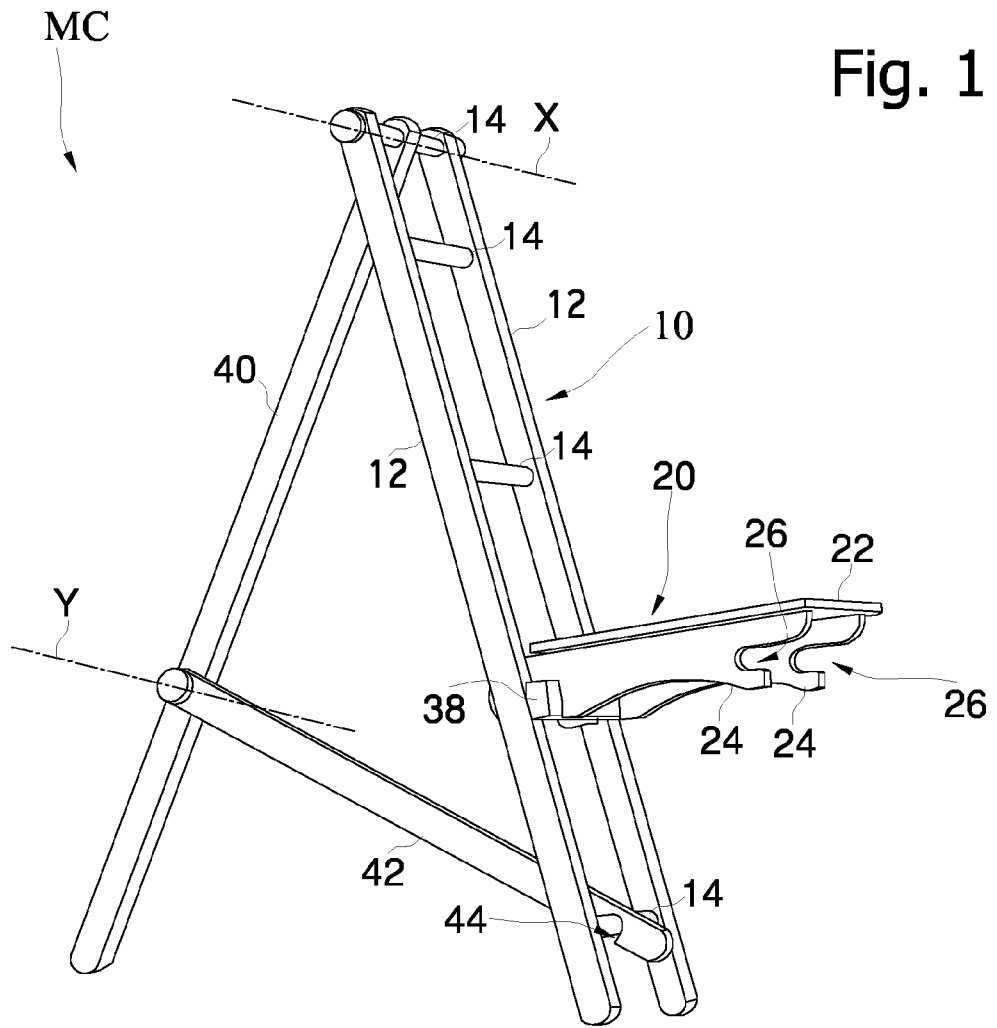
[0039] Preferably, a wheel is mounted at one end of one or each bar 12 or 40, to allow the sliding of the assembly MC by touching the ground. The assembly MC thus becomes equivalent to a wheelbarrow.

[0040] To construct the assembly MC, as a whole or parts thereof, wood, plastic or metal, e.g. aluminum, may be used.

Claims

1. Assembly (MC) constituted by a flat support element (20) and a ladder (10) with at least one peg (14), wherein the support element comprises a flat surface (22) and a seat (28) engageable when needed by the peg so that the support element remains integral with the ladder and thus allows the leaning of an object,
characterized in that
the seat (28) has a form (i) substantially complementary to the peg and (ii) such that it can engage it, and the support element comprises a second seat (30) engageable by a transverse bar (38) adapted to abut against the sides of the ladder and prevent a relative rotation of the seat with respect to the peg.
2. Assembly according to claim 1, wherein the first and the second seats are both comprised in a continuous shaping of the support element.
3. Assembly according to claim 1 or 2, wherein the first seat has a U- or L-shaped form, with a concavity oriented along a direction substantially parallel to the flat surface.
4. Assembly according to claim 1 or 2 or 3, wherein the support element comprises a third seat which is as spaced from the first, in a direction parallel to the flat surface, as about the separation between two pegs, and adapted to fittingly receive a peg.
5. Assembly according to claim 3 and 4, wherein the third seat has U- or L-shaped form, with a concavity oriented along the same direction substantially parallel to the flat surface of the first seat.
6. Assembly according to any one of the preceding claims, wherein the support element comprises an element protruding orthogonally from the flat surface, the seats being formed in the protruding element.

7. Assembly according to claim 6, comprising two protruding elements according to claim 6 located spaced apart and parallel to each other.
8. Assembly according to any one of the preceding claims, comprising a bar that is hinged at one end of the ladder and has length approximately equal to the latter.
9. The assembly of claim 8, wherein to the bar there is hinged an arm adapted to joint in a non-permanent manner with a peg.
10. Assembly according to any one of the preceding claims, comprising a wheel mounted at one end of the ladder.





EUROPEAN SEARCH REPORT

Application Number
EP 16 16 7834

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The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 8 September 2016	Examiner Bauer, Josef
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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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

REFERENCES CITED IN THE DESCRIPTION

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