Office de la Propriété Intellectuelle du Canada
Un organisme d'Industrie Canada

Canadian Intellectual Property Office
An agency of Industry Canada

CA 2933681 A1 2015/07/16

(21) 2 933 681

(12) DEMANDE DE BREVET CANADIEN
CANADIAN PATENT APPLICATION

(13) A1

(86) **Date de dépôt PCT/PCT Filing Date:** 2014/12/17
(87) **Date publication PCT/PCT Publication Date:** 2015/07/16
(85) **Entrée phase nationale/National Entry:** 2016/06/13
(86) **N° demande PCT/PCT Application No.:** SE 2014/051522
(87) **N° publication PCT/PCT Publication No.:** 2015/105450
(30) **Priorité/Priority:** 2014/01/10 (SE1450018-5)

(51) **Cl.Int./Int.Cl.** ***A47B 47/00*** (2006.01),
F16B 12/10 (2006.01)

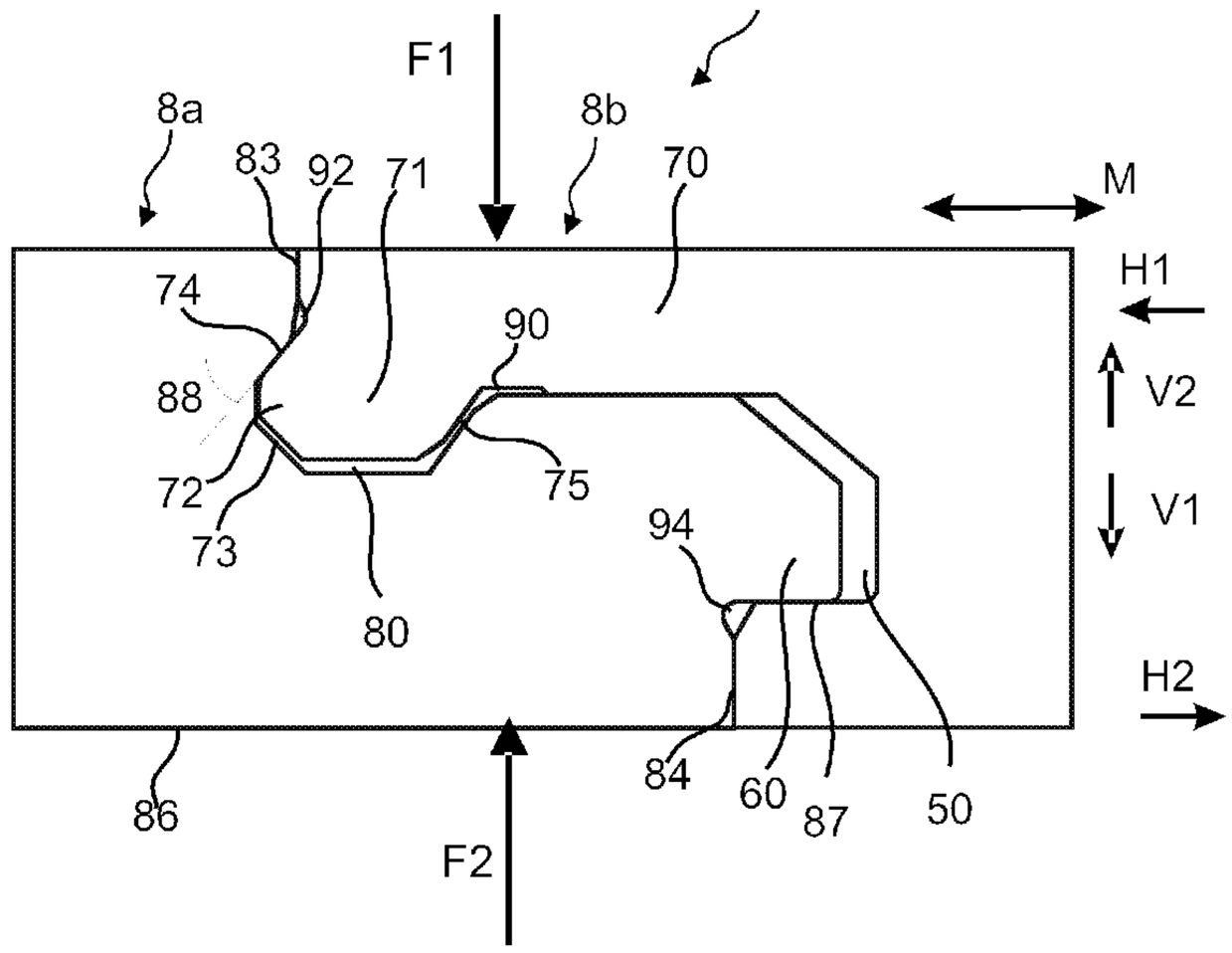
(71) **Demandeur/Applicant:**
VALINGE INNOVATION AB, SE

(72) **Inventeur/Inventor:**
BOO, CHRISTIAN, SE

(74) **Agent:** FETHERSTONHAUGH & CO.

(54) **Titre : PANNEAU DE MEUBLE**
(54) **Title: A FURNITURE PANEL**

FIG 1A



(57) **Abrégé/Abstract:**
A furniture panel 8 is provided, in which a first element 8a and a second element 8b that are mechanically locked together. A first tongue is provided at a first edge of the first element, the first tongue cooperating with a first tongue groove provided at a second edge of the second element for locking the first and second elements in a vertical direction, and a second tongue at the second edge of the second element, the second tongue cooperating with a second tongue groove at the first edge of the first element for locking the first and second elements in the vertical direction. A first pair of locking surfaces is provided above the second tongue and the second tongue groove for locking in a horizontal direction, and a second pair of locking surfaces is provided below the first tongue and the first tongue groove for locking in the horizontal direction.

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
16 July 2015 (16.07.2015)

WIPO | PCT

(10) International Publication Number
WO 2015/105450 A1

(51) International Patent Classification:
A47B 47/00 (2006.01) *F16B 12/10* (2006.01)

(21) International Application Number:
PCT/SE2014/051522

(22) International Filing Date:
17 December 2014 (17.12.2014)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
1450018-5 10 January 2014 (10.01.2014) SE

(71) Applicant: **VÄLINGE INNOVATION AB** [SE/SE]; Prästavägen 513, SE-263 65 Viken (SE).

(72) Inventor: **BOO, Christian**; Tvärgatan 8, SE-268 77 Kågeröd (SE).

(74) Agent: **ENGSTRAND, Ola**; Välinge Innovation AB, Prästavägen 513, SE-263 65 Viken (SE).

(81) Designated States *(unless otherwise indicated, for every kind of national protection available)*: AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IR, IS, JP, KE, KG, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States *(unless otherwise indicated, for every kind of regional protection available)*: ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, ST, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, KM, ML, MR, NE, SN, TD, TG).

Declarations under Rule 4.17:

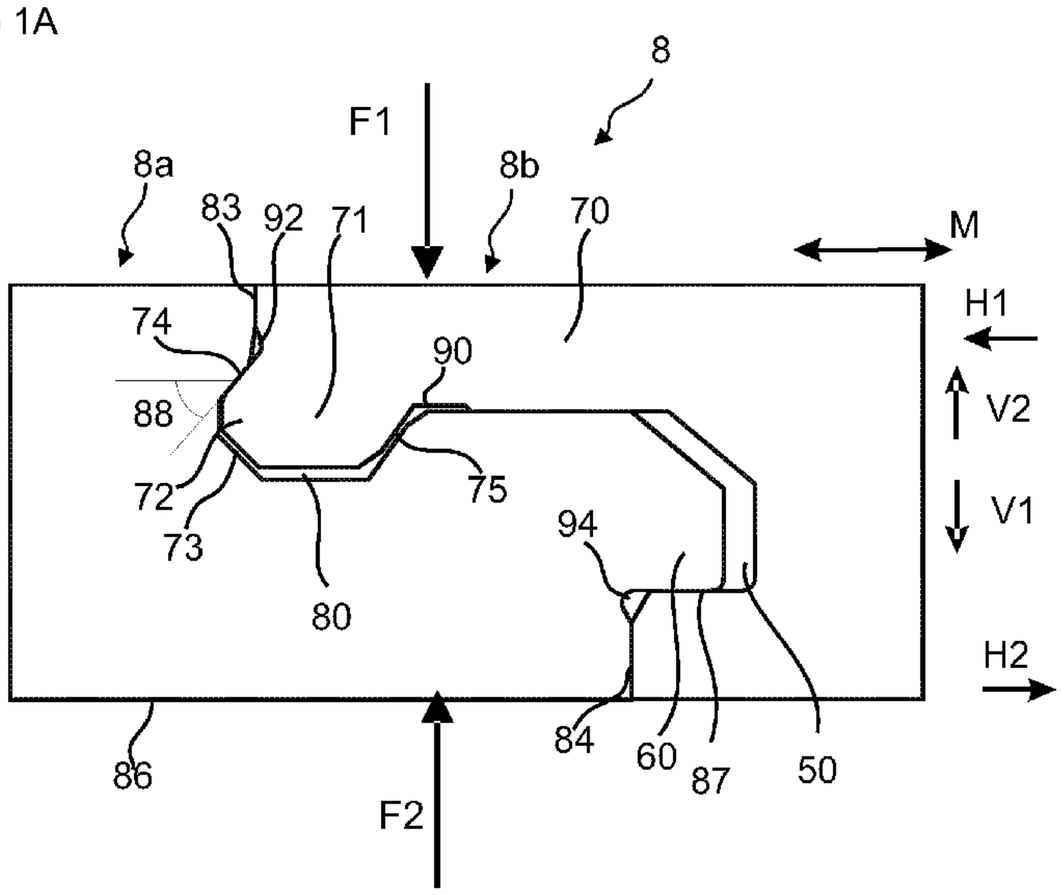
— *as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))*

Published:

— *with international search report (Art. 21(3))*

(54) Title: A FURNITURE PANEL

FIG 1A



(57) Abstract: A furniture panel 8 is provided, in which a first element 8a and a second element 8b that are mechanically locked together. A first tongue is provided at a first edge of the first element, the first tongue cooperating with a first tongue groove provided at a second edge of the second element for locking the first and second elements in a vertical direction, and a second tongue at the second edge of the second element, the second tongue cooperating with a second tongue groove at the first edge of the first element for locking the first and second elements in the vertical direction. A first pair of locking surfaces is provided above the second tongue and the second tongue groove for locking in a horizontal direction, and a second pair of locking surfaces is provided below the first tongue and the first tongue groove for locking in the horizontal direction.

WO 2015/105450 A1

A FURNITURE PANEL

Technical Field

The present invention relates to a furniture panel, such as a back panel or a bottom panel, comprising a first element and a second element The present invention also relates to an assembled product, such as a bookshelf, a cupboard, a wardrobe, a box, a drawer or a furniture component, comprising the furniture panel.

Background

A furniture panel, such as a back panel or bottom panel, comprising a first element and a second element is known. The first element and the second element of the known furniture panel may be fixed by nailing the first element and the second element to a frame of an assembled product.

Summary

One object of certain embodiments of the present invention to provide an improvement over the above described technique and the known art. A specific objective is to improve the strength of a furniture panel, such as a back panel or bottom panel, comprising a first element and a second element. Another objective is to decrease the package size of a so-called flat-pack furniture. The back panel or the bottom panel of a flat-pack furniture may be the largest panel of the furniture compared to other panels of the furniture. A large furniture panel divided into two or more separate elements that can be mechanically locked together to form the large panel may therefore decrease the package size of the flat-pack furniture.

A further object of the present invention is to provide an assembled product with increased strength and stability.

At least some of these and other objects and advantages that will be apparent from the description have been achieved by a furniture panel comprising a first element and a second element which are configured to be locked together. A first main plane of the first element is essentially parallel to a second main plane of the second element when the first element and the second element are locked together. The furniture panel comprises a first face and an opposite second face which are parallel to a main plane of the furniture panel when the first element and the second element are locked together.

The first element and the second element is provided with a mechanical locking system comprising:

a first tongue provided at a first edge of the first element, wherein the first tongue is configured to cooperate with a first tongue groove provided at a second edge of the second element for locking together the first element and the second element in a first vertical direction perpendicular to the main plane of the furniture panel;

a second tongue at the second edge of the second element, wherein the second tongue is configured to cooperate with a second tongue groove at the first edge of the first element for locking together the first element and the second element in a second vertical direction perpendicular to the main plane of the furniture panel;

a first pair of locking surfaces provided above the second tongue and the second tongue groove for locking together the first element and the second element in a first horizontal direction parallel to the main plane of the furniture panel; and

second pair of locking surfaces provided below the first tongue and the first tongue groove for locking together the first element and the second element in a second horizontal direction parallel to the main plane of the furniture panel.

The mechanical locking system may provide a furniture panel with a joint between the first element and the second element that is hard to detect at the first face and the second face of the furniture panel. Further, the first tongue and the second tongue and the first tongue groove and the second tongue groove may provide a connection in the furniture panel that is essentially planar at the joint between the first element and the second element.

The first pair of locking surfaces is preferably essentially vertical and the second pair of locking surfaces is also preferably essentially vertical.

The first tongue and the first tongue groove may cooperate at a third pair of locking surfaces that is preferably arranged essentially horizontally.

The second tongue and the second tongue groove may cooperate at a fourth pair of locking surfaces that is preferably arranged at an angle to the main plane of the furniture panel that is greater than zero. The angle preferably allows the first element to be locked to the second element by an angling motion of the first element relative to the second element or of the second element relative to the first element, wherein the first tongue is

inserted in the first tongue groove. The angle may be in the range of about 30° to about 60°, and is preferably about 45°.

A first space may be provided in the first tongue groove above the first tongue in a locked state of the first element and the second element. A second space may be provided in the second tongue groove under the second tongue in a locked state of the first element and the second element.

The second element may include a strip extending between the protruding element and the first tongue groove, and the strip may include a recess adjacent the protruding element.

A gap may be provided below the first pair of locking surfaces and above the second tongue when the first element and the second element are locked together. In addition, a gap may be provided below the first tongue and above the second pair of locking surfaces when the first element and the second element are locked together.

A core material of the first element and the second element preferably comprises a wood fibre based board, such as a HDF, MDF, plywood, solid wood or particleboard, a plastic board, or a wood plastic board.

The mechanical locking system is preferably made by mechanical cutting, such as milling, of the first edge of the first element and the second edge of the second element.

A second aspect of the invention is an assembled product, such as a furniture component, comprising the furniture panel described above. The assembled product is preferably configured to be assembled without tools.

Brief description of the drawings

Embodiments of the present invention will by way of example be described in more detail with reference to the appended schematic drawings, in which:

FIGS. 1A-1B show a furniture panel according to embodiments of the invention.

FIGS. 2A-2B show embodiments of a furniture component comprising furniture panel according to an embodiment of the invention.

Detailed description

FIG. 1A shows an embodiment of a furniture panel 8, such as a back panel or bottom panel. The furniture panel 8 comprises a first element 8a and a second element 8b which are configured to be locked together. A first main plane of the first element is essentially parallel to a second main plane of the second element when the first element 8a and the second element 8b are locked together. The furniture panel 8 comprises a first face 85 and an opposite second face 86 which are parallel to a main plane M of the furniture panel 8 when the first element 8a and the second element 8b are locked together. The first element and the second element are provided with a mechanical locking system comprising:

a first tongue 60 provided at a first edge of the first element 8a, wherein the first tongue 60 is configured to cooperate with a first tongue groove 50 provided at a second edge of the second element 8b for locking together the first element 8a and the second element 8b in a first vertical direction V1;

a second tongue 72 at the second edge of the second element 8b, wherein the second tongue 72 is configured to cooperate with a second tongue groove 73 at the first edge of the first panel 8a for locking together the first element 8a and the second element 8b in a second vertical direction V2;

a first pair of locking surfaces 83 provided above the second tongue 72 and the second tongue groove 73 for locking together the first element 8a and the second element 8b in a first horizontal direction H1 parallel to the main plane M of the furniture panel 8; and

second pair of locking surfaces 84 provided below the first tongue 60 and the first tongue groove 50 for locking together the first element 8a and the second element 8b in a second horizontal direction H2.

The second horizontal direction H2 may be opposite to the first horizontal direction H1. The second vertical direction V2 may be opposite to the first vertical direction V1.

The mechanical locking system is preferably made by mechanical cutting, such as milling, of the first edge of the first element 8a and the second edge of the second element 8b.

The first pair of locking surfaces 83 is preferably essentially vertical. The second pair of locking surfaces 84 is also preferably essentially vertical.

The first tongue 60 and the first tongue groove 50 cooperate at a third pair of locking surfaces 87 that is preferably arranged essentially horizontally.

The second tongue 72 and the second tongue groove 73 cooperate at a fourth pair of locking surfaces 74 that is preferably arranged at an angle 88 to the main plane M of the furniture panel 8 that is greater than zero. The angle 88 has a range that allows the first element 8a to be locked to the second element 8b by an angling motion of the first element 8a relative to the second element 8b or of the second element 8b relative to the first element 8a, wherein the first tongue 60 is inserted in the first tongue groove 50. An embodiment of the angling motion of the first element 8a relative to the second element 8b is shown in FIG 1B.

The first face 85 is arranged upwards in the vertical direction, e.g., in the direction were the greatest load F1 is likely to be exerted on the furniture panel 8, to prevent the first element 8a and the second element 8b from being unlocked by a reversed angling motion.

The second face 86 is arranged downwards in the vertical direction, e.g., in the direction where the smallest load F2 is likely to be applied on the furniture panel 8. The second tongue 72 and the second tongue groove 73 may provide a resistance for unlocking of the first element 8a and the second element 8b by a reversed angling motion.

The angle 88 may be in the range of about 30° to about 60°. The angle is preferably about 45°.

A first space may be provided in the first tongue groove 50 above the first tongue 60 in a locked state of the first element 8a and the second element 8b. A second space may be provided in the second tongue groove 73 under the second tongue 72 in a locked state of the first element 8a and the second element 8b.

The second edge of the second element 8b may be provided with a protruding element 71 that essentially matches a third groove 80 provided at the first edge of the first element 8a. The protruding element 71 may protrude upwards in the first vertical direction V1 and the groove 80 may be open downwards in the second vertical direction V2. A third space 75, that extends in first and second horizontal direction H1, H2, may be provided between the protruding element 73 and the third groove 80. The third space 75 may facilitate the locking by an angling motion.

The second element 8b includes a strip 70 extending between the protruding element 71 and the first tongue groove 50. The strip 70 may include a recess 90 adjacent the protruding element 71. The recess 90 may provide the protruding element 71 with flexibility during locking of the first element 8a with the second element 8b.

In some embodiments, a gap 92 is provided below the first pair of locking surfaces 83 and above the second tongue 72 when the first element 8a and the second element 8b are locked together. In addition, a gap 94 may be provided below the first tongue 60 and above the second pair of locking surfaces 84 when the first element 8a and the second element 8b are locked together.

A core material of the first element 8a and the second element 8b in the various embodiments above preferably comprises a wood fibre based board, such as a HDF, MDF, plywood, solid wood or particleboard, a plastic board, or a wood fibre composite board.

FIGS. 2A-2B show embodiments of an assembled product, such as a furniture component, comprising embodiments of the furniture panel 8 disclosed above. FIG. 2A shows an embodiment of the assembled product, such as a cupboard. The assembled product includes a frame formed by perimeter panels 2, 4, 5, 6, and the first element 8a and the second element 8b serving as a back furniture panel 8. The assembled product may also include a divider panel 3. Edges of the panels 2, 3, 4, 5, 6 may be locked together as shown in FIG. 2A with a mechanical device comprising a flexible tongue 30.

FIG. 2B shows an embodiment comprising a third element 8c, which is connected to the second element 8b with the mechanical locking system discussed above. This assembled product is in the form of a drawer, with end panels 1 and 6 serving as back and front ends of the drawer, respectively. The mechanical device may comprising the flexible tongue 30 may facilitate an assembling of the assembled product without the use of tools and/or binding agents such as glue. For instance, end panel 6 is moved into engagement with a partially assembled product in the direction of arrow 44 so that the flexible tongue 30 engages with other parts of the mechanical device to effectuate locking. The panels of the assembled product may be assembled according to embodiment disclosed in the Swedish patent application SE 1351060-7, e.g. as in FIG 4B and FIG 5A.

Edges of the furniture panel may be inserted into grooves at bottom edges of the perimeter panels. The furniture panel is preferably locked to at least two of the perimeter panels by a mechanical device comprising a flexible tongue 30.

5

CLAIMS

1. A furniture panel comprising a first element (8a) and a second element (8b) which are configured to be locked together, wherein a first main plane of the first element is essentially parallel to a second main plane of the second element when the first element and the second element are locked together, wherein the furniture panel comprises a first face (85) and an opposite second face (86) which are parallel to a main plane of the furniture panel when the first element and the second element are locked together, characterized in that the first element and the second element are provided with a mechanical locking system, the mechanical locking system comprising:

a first tongue (60) provided at a first edge of the first element (8a), wherein the first tongue is configured to cooperate with a first tongue groove (50) provided at a second edge of the second element (8b) for locking together the first element and the second element in a first vertical direction (V1) perpendicular to the main plane of the furniture panel;

a second tongue (72) at the second edge of the second element (8b), wherein the second tongue is configured to cooperate with a second tongue groove (73) at the first edge of the first element (8a) for locking together the first element and the second element in a second vertical direction (V2)) perpendicular to the main plane of the furniture panel;

a first pair of locking surfaces (83) provided above the second tongue and the second tongue groove for locking together the first element (8a) and the second element (8b) in a first horizontal direction (H1) parallel to the main plane of the furniture panel; and

a second pair of locking surfaces (84) provided below the first tongue and the first tongue groove for locking together the first element (8a) and the second element (8b) in a second horizontal direction (H2) parallel to the main plane of the furniture panel.

2. The furniture panel as claimed in claim 1, wherein the first pair of locking surfaces (83) is essentially vertical.

3. The furniture panel as claimed in claim 1 or 2, wherein the second pair of locking surfaces (84) is essentially vertical.

4. The furniture panel as claimed in any one of the preceding claims, wherein the first tongue (60) and the first tongue groove (50) cooperate at a third pair of locking surfaces (87) that is arranged essentially horizontally.

5. The furniture panel as claimed in any one of the preceding claims, wherein the second tongue (72) and the second tongue groove (73) cooperate at a fourth pair of locking surfaces (74) that is arranged at an angle (88) to the main plane of the furniture panel that is greater than zero.

6. The furniture panel as claimed in claim 5, wherein the angle (88) is configured so that the first element is locked to the second element by an angling motion of the first element relative to the second element or of the second element relative to the first element, wherein the first tongue (60) is inserted in the first tongue groove (50).

7. The furniture panel as claimed in claim 5 or 6, wherein the angle (88) is in a range of about 30° to about 60°, and preferably about 45°.

8. The furniture panel as claimed in any one of the preceding claims, wherein a first space is provided in the first tongue groove above the first tongue (60) in a locked state of the first element and the second element.

9. The furniture panel as claimed in any one of the preceding claims, wherein a second space is provided in the second tongue groove under the second tongue (72) in a locked state of the first element and the second element.

10. The furniture panel as claimed in any one of the preceding claims, wherein a core material of the first element and the second element comprises a wood fibre based board that is at least one of HDF, MDF, plywood, solid wood or particleboard, a plastic board and a wood fibre composite board.

11. The furniture panel as claimed in any one of the preceding claims, wherein the second element includes a strip (70) extending between the protruding element and the first tongue groove, the strip including a recess 90 adjacent the protruding element.

12. The furniture panel as claimed in any one of the preceding claims, wherein a gap (92) is provided below the first pair of locking surfaces and above the second tongue when the first element and the second element are locked together.

13. The furniture panel as claimed in any one of the preceding claims, wherein a gap (94) is provided below the first tongue and above the second pair of locking surfaces when the first element and the second element are locked together.

FIG 1A

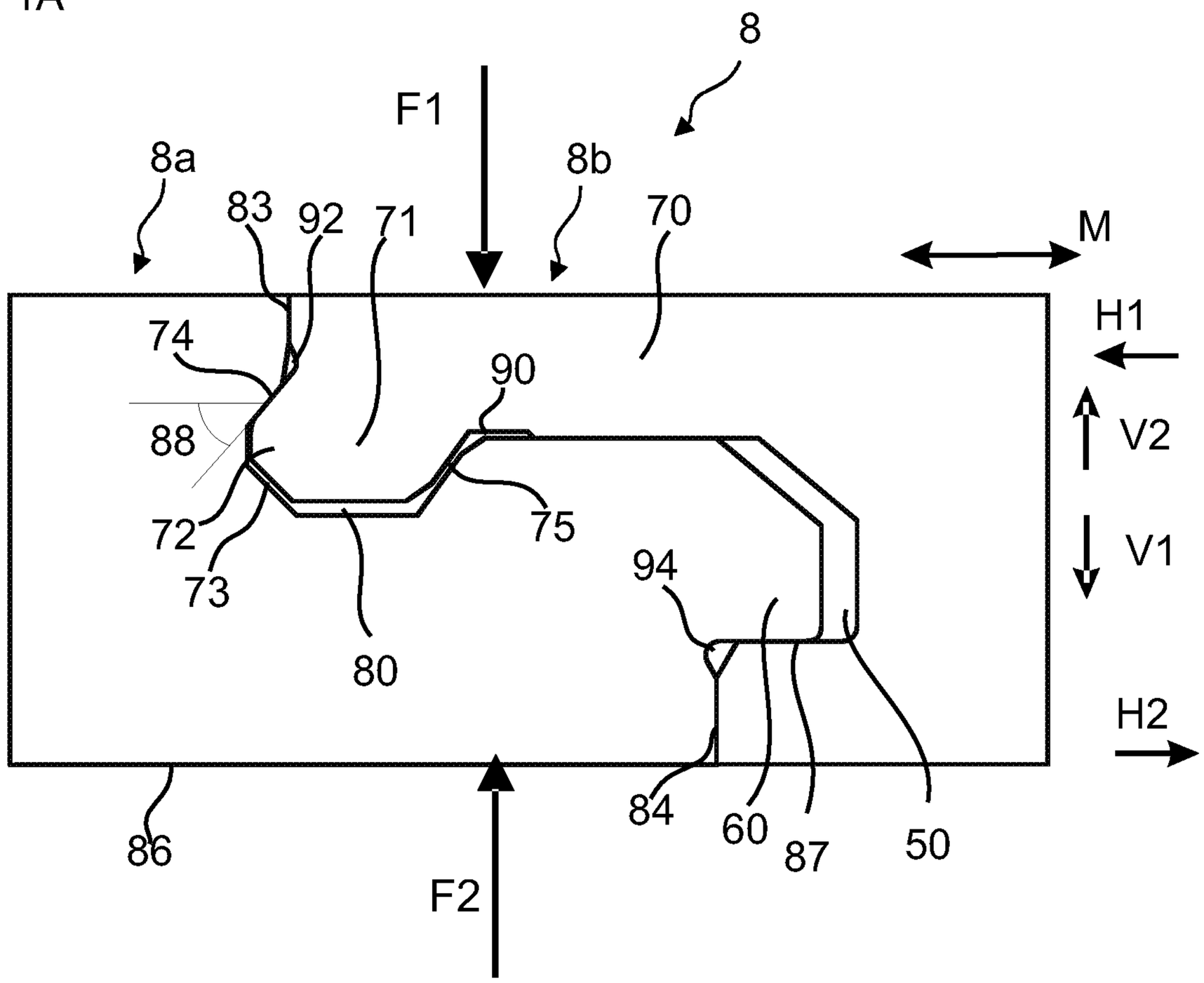

8
F1
8a
8b
83
92
71
70
M
74
90
H1
88
V2
72
75
V1
73
94
80
H2
84
60
87
50
86
F2

FIG 1B

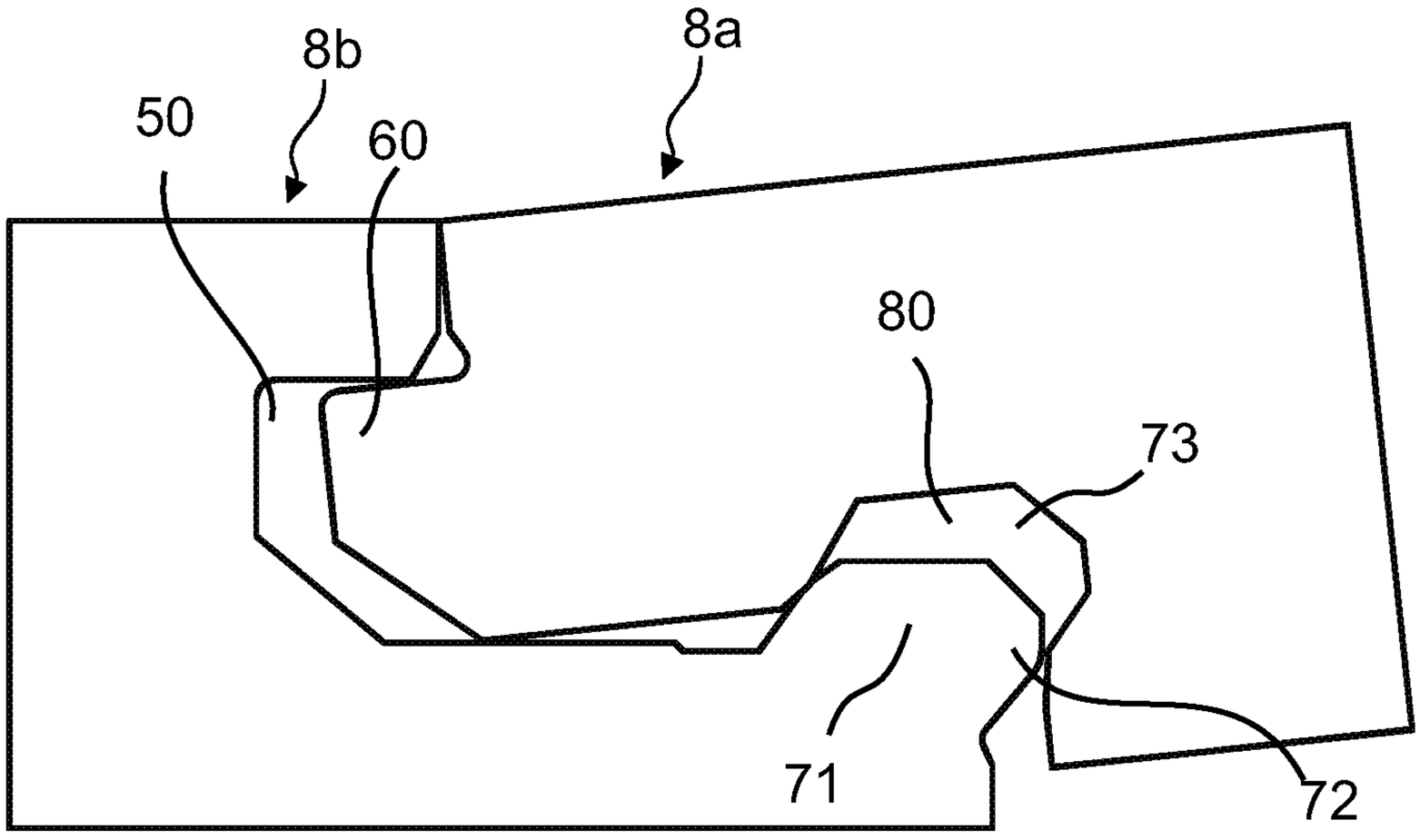

8b
8a
50
60
80
73
71
72

FIG 2A

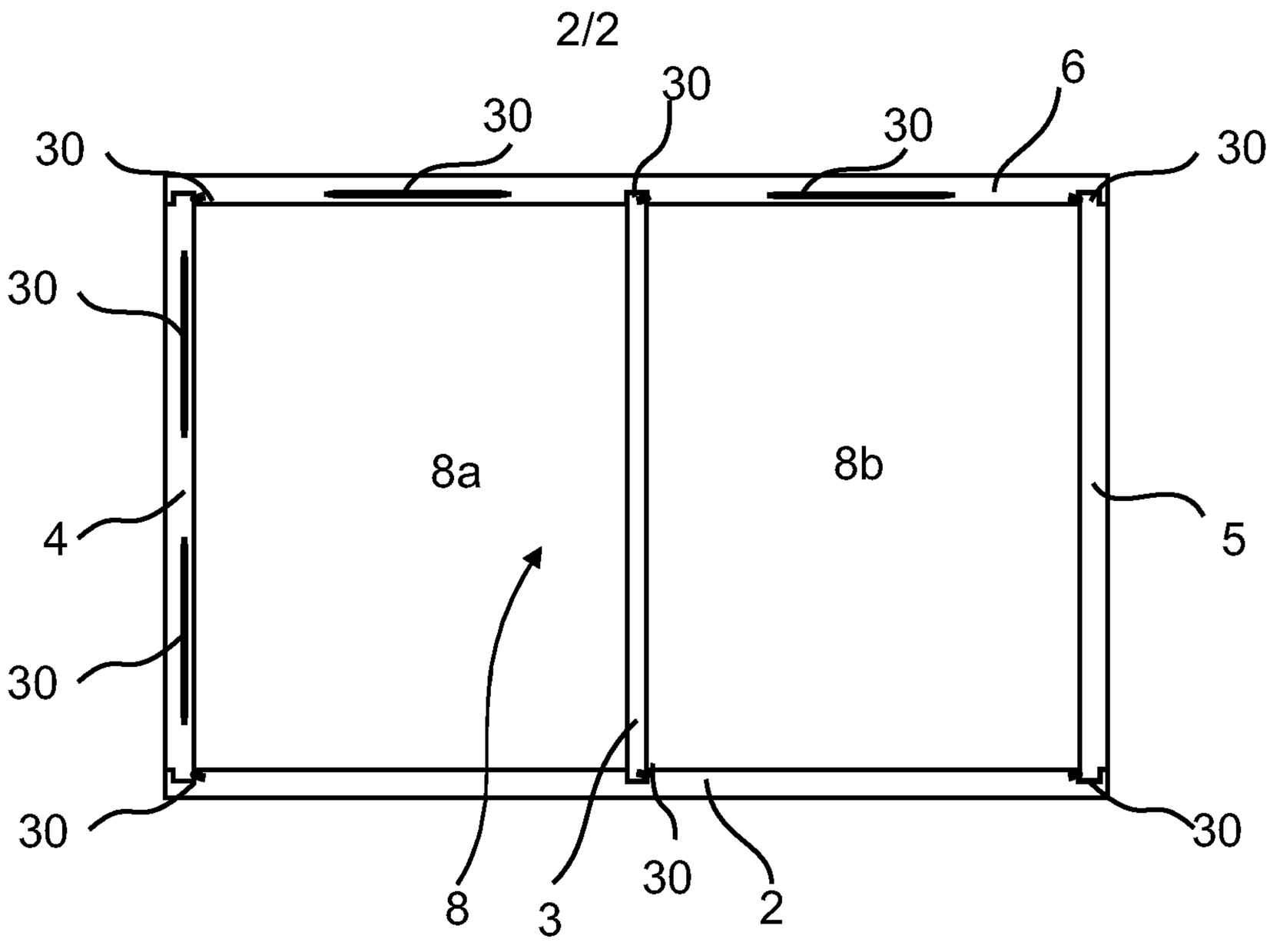

30
30
30
6
30
30
8a
8b
4
5
30
30
8
3
30
2
30

FIG 2B

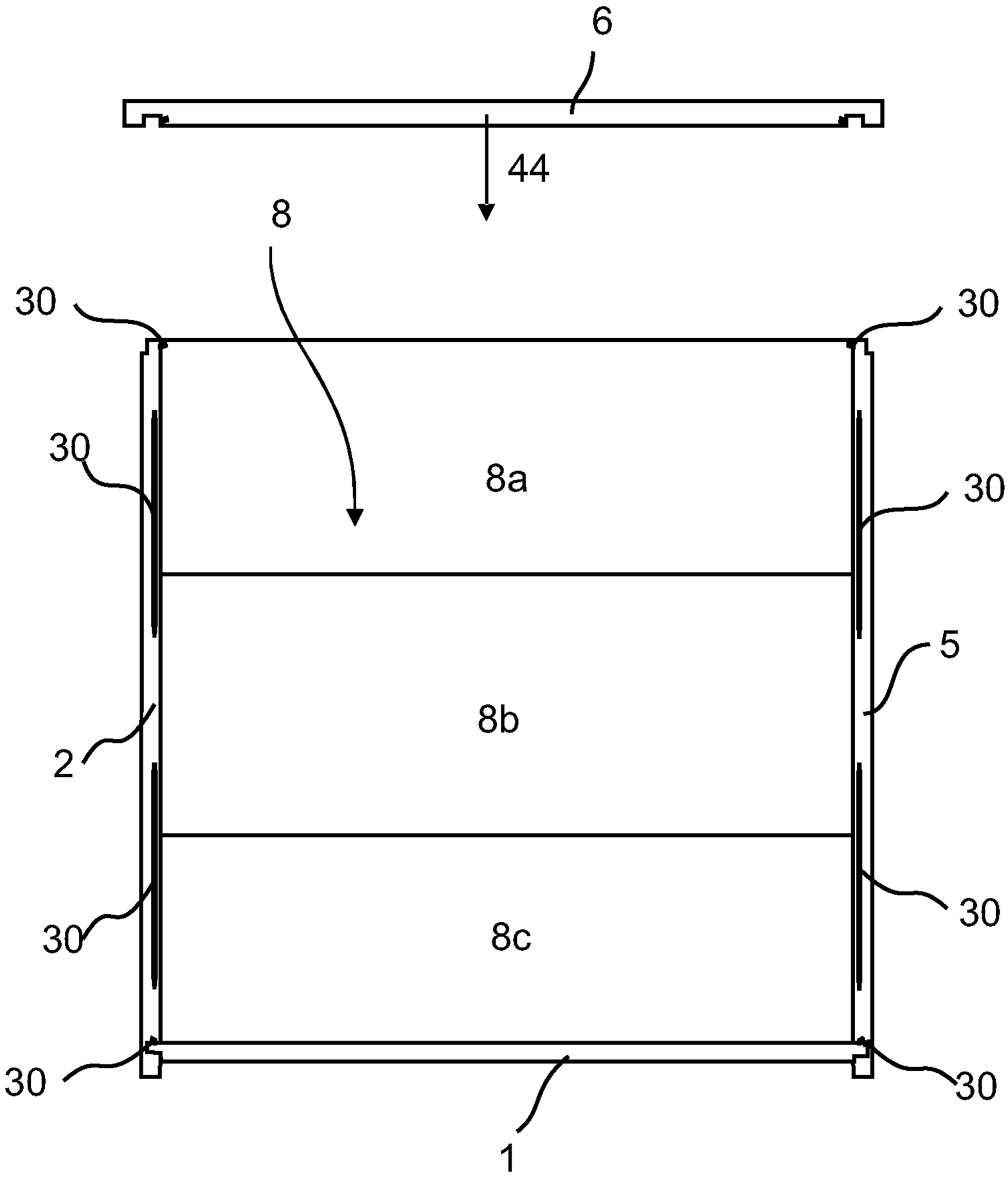
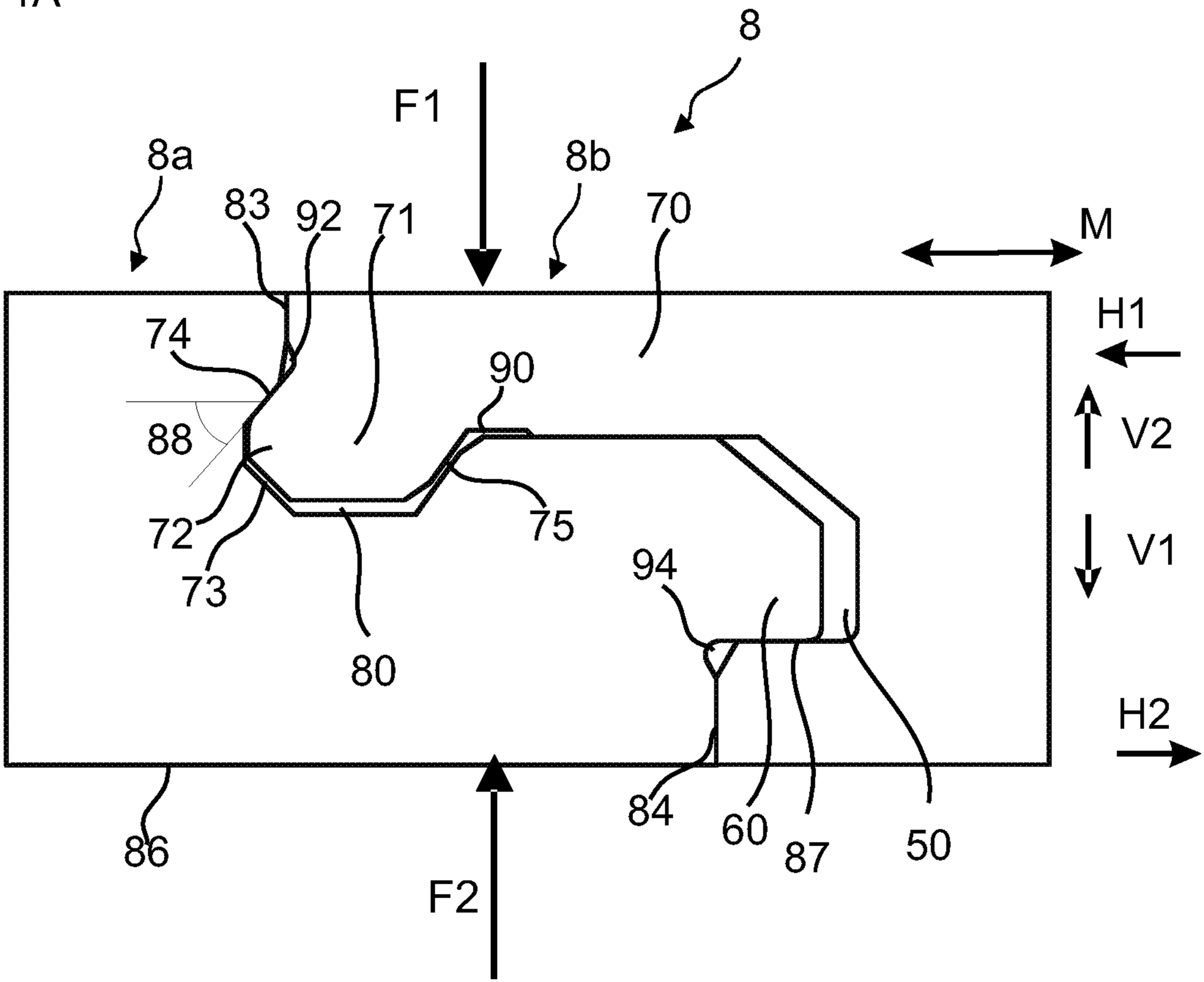

6
44
8
30
30
30
8a
30
5
8b
2
30
8c
30
30
1

FIG 1A


8
F1
8a
8b
83
92
71
70
M
H1
74
90
88
V2
72
75
73
V1
94
80
H2
84
60
87
50
86
F2