US 20200032522A1

(19) **United States**

(12) **Patent Application Publication** (10) **Pub. No.: US 2020/0032522 A1**

AQUILANI (43) **Pub. Date: Jan. 30, 2020**

(54) **LEVELING COATING STRUCTURE WITH QUICK INSTALLATION AND REMOVAL**

(71) Applicant: **I DECK S.R.L.**, Vetralla (IT)

(72) Inventor: **Enrico AQUILANI**, Vetralla (IT)

(21) Appl. No.: **16/337,062**

(22) PCT Filed: **Sep. 21, 2017**

(86) PCT No.: **PCT/IB2017/055716**

§ 371 (c)(1),
(2) Date: **Mar. 27, 2019**

(30) **Foreign Application Priority Data**

Sep. 28, 2016 (IT) 102016000097094

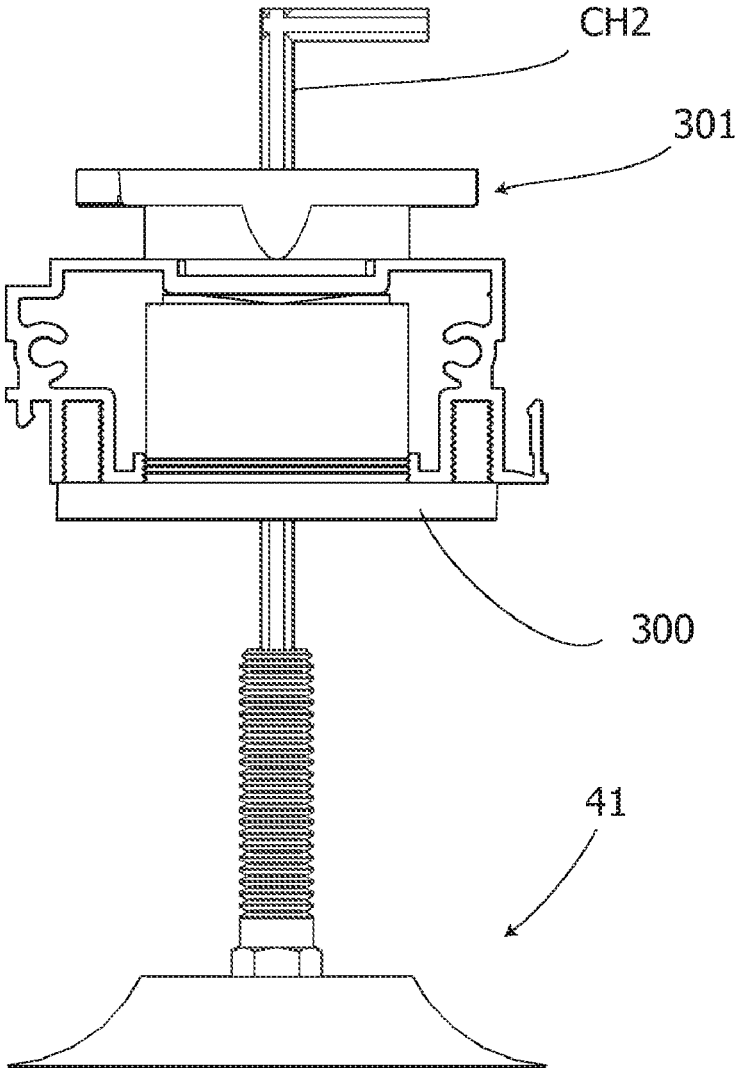
Publication Classification

(51) **Int. Cl.**
E04F 13/08 (2006.01)

(52) **U.S. Cl.**
CPC ***E04F 13/0826*** (2013.01); ***E04F 13/0807*** (2013.01)

(57) **ABSTRACT**

A leveling coating structure with quick installation and removal includes a plurality of parallel sections; a multiplicity of clips having a head with a stem and a bushing with inserts, the stem being inserted in a through hole of the section and rotatably retained by the inserts of the bushing which is in abutment with the bottom of the base frame opposite to the head of the clip; a succession of slats having opposite lateral grooves which the head of the clip engages. Each section is made of light alloy with a C-shaped cross-section having a core for supporting the slats and wings for the insertion of the bushings between them. Each clip is retained by the section with the head in abutment with the core for supporting the slats and the bushing in abutment with the free ends of the wings.



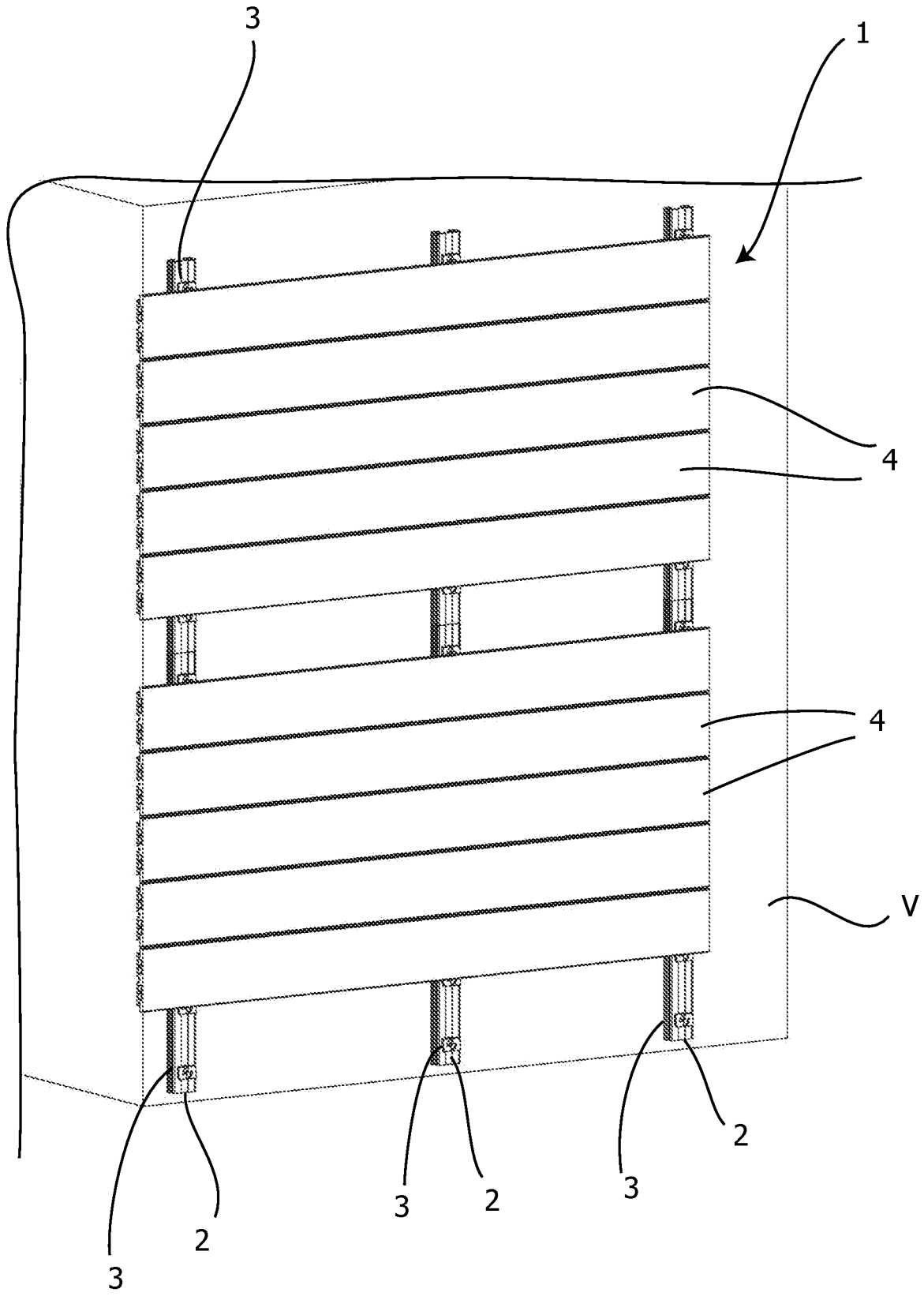


Fig. 1

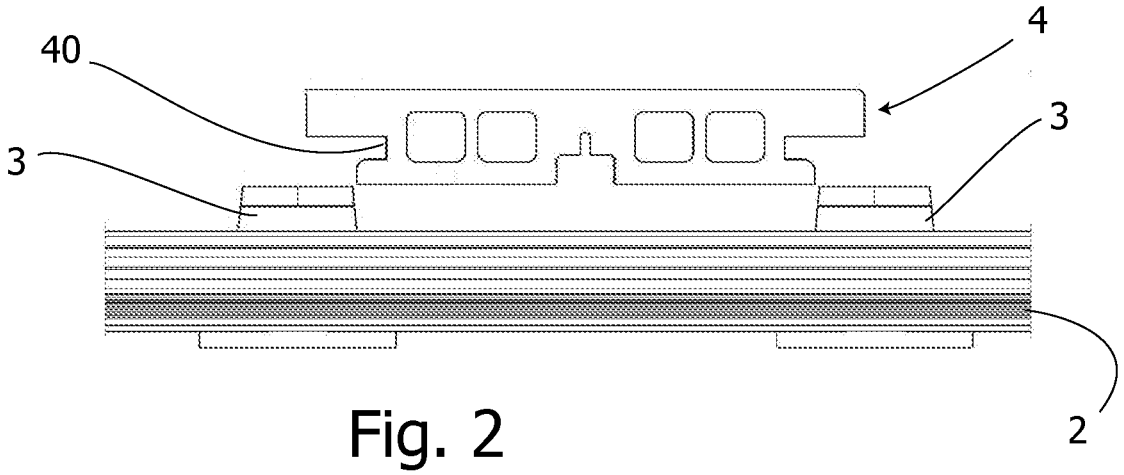


Fig. 2

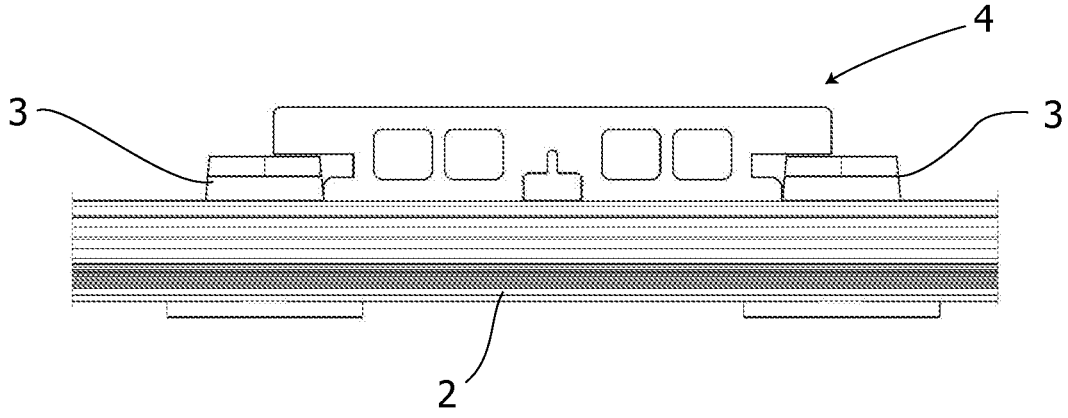


Fig. 3

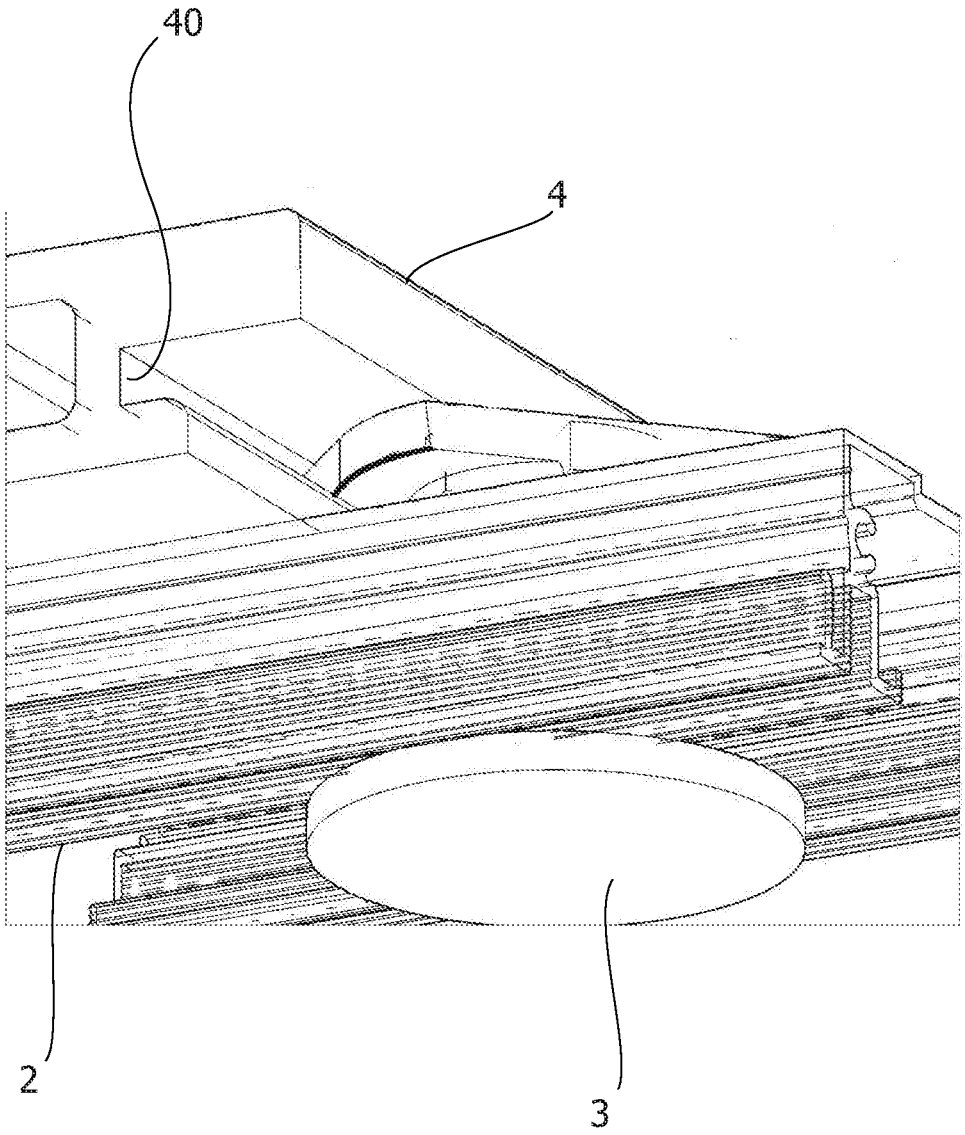


Fig. 4

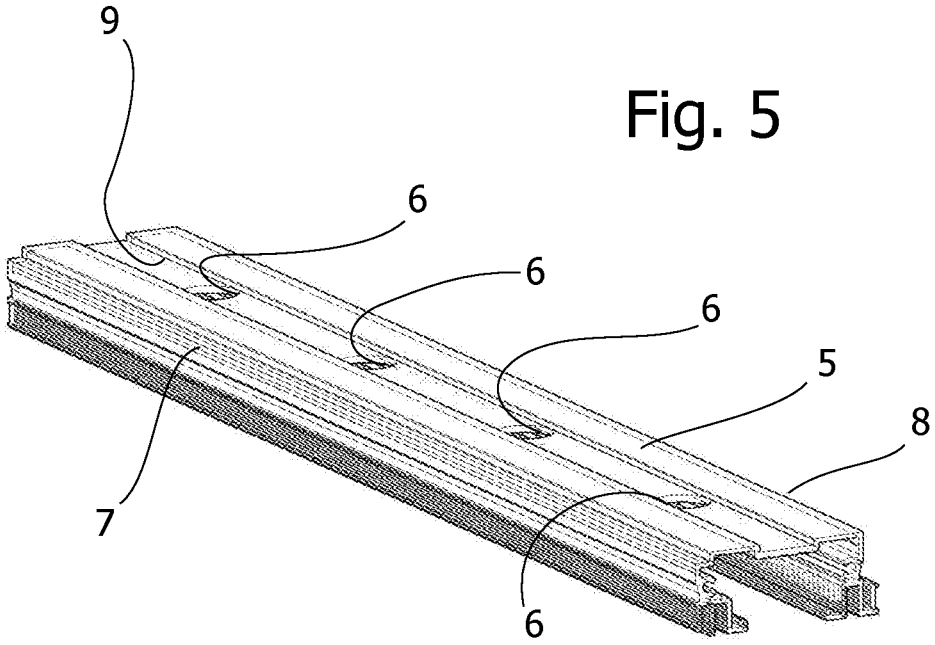


Fig. 5

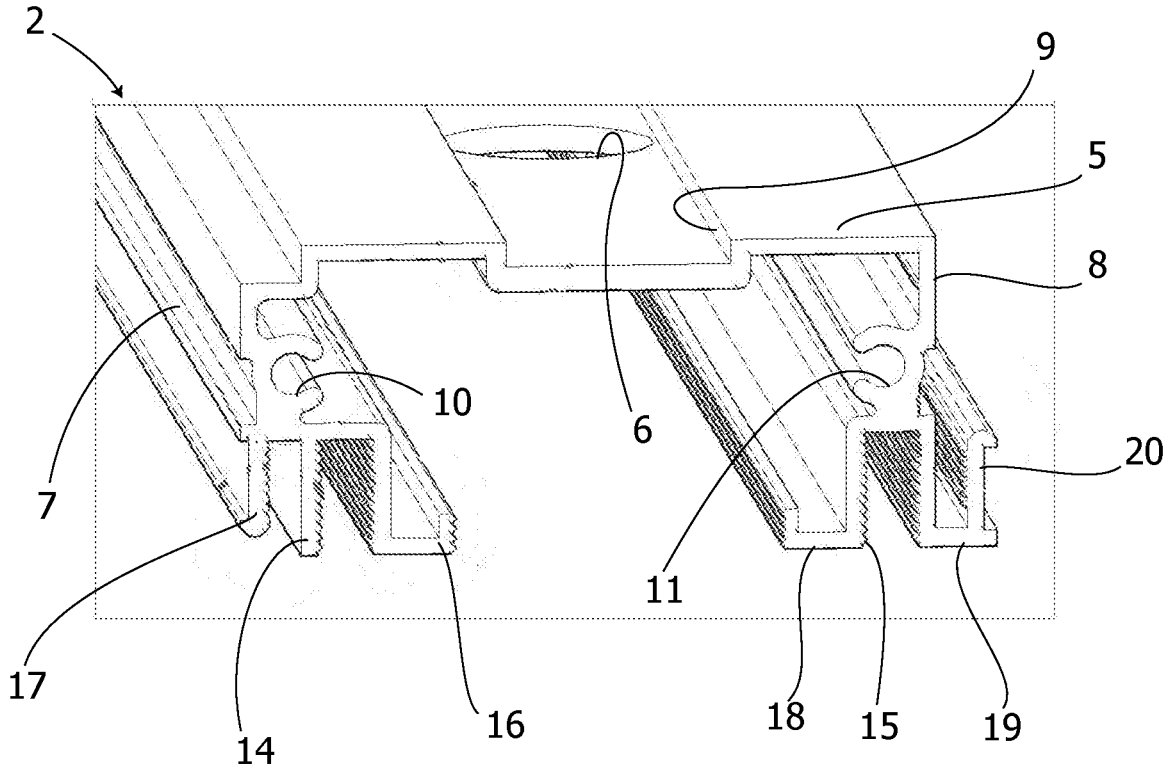


Fig. 6

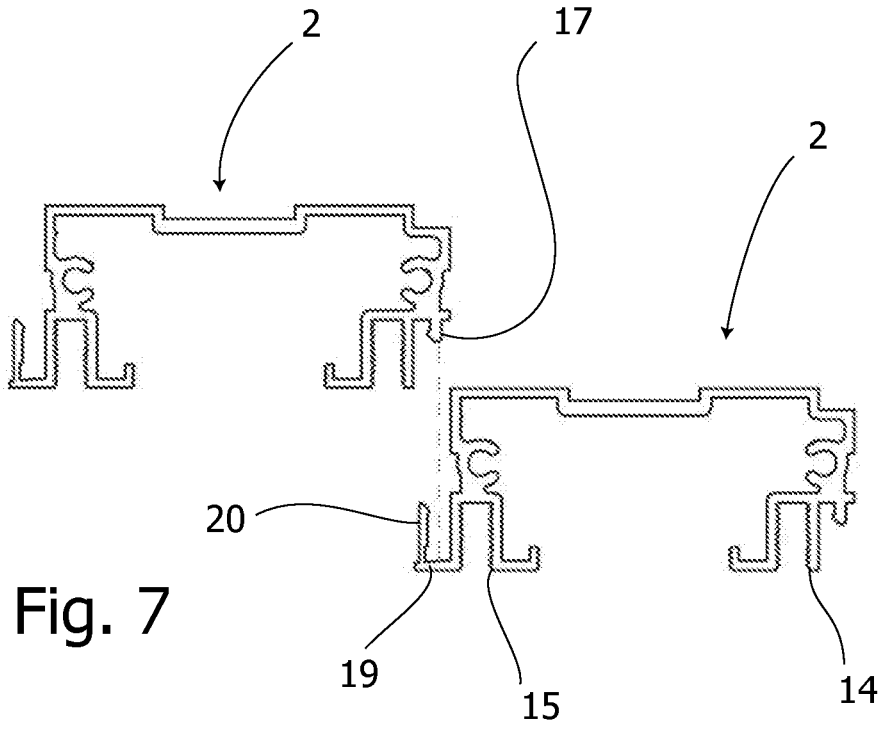


Fig. 7

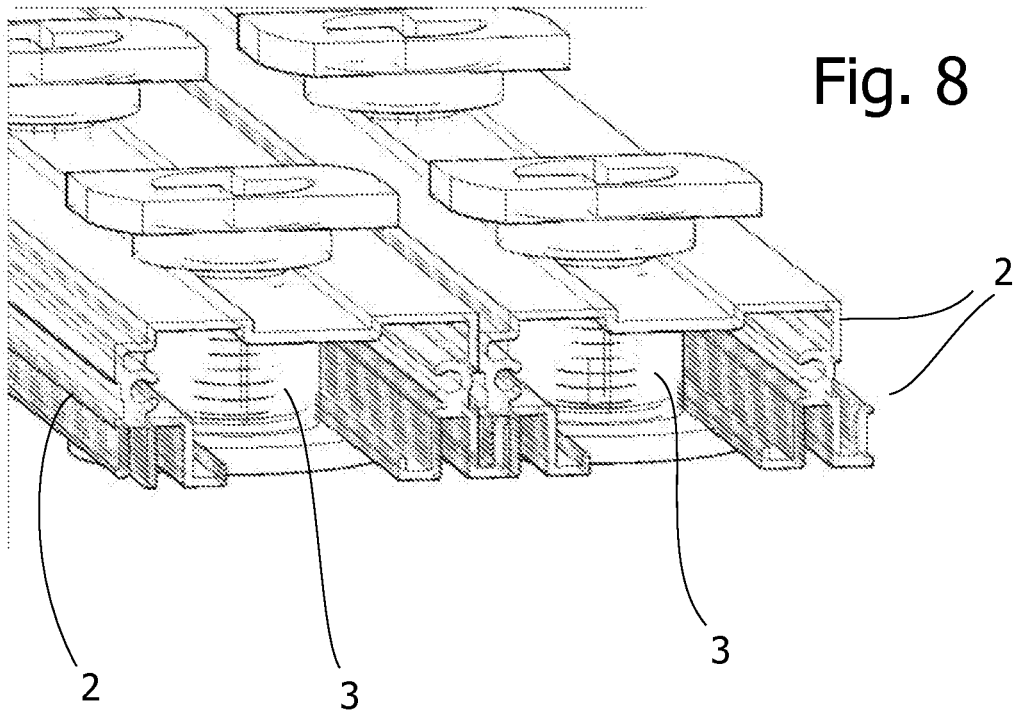


Fig. 8

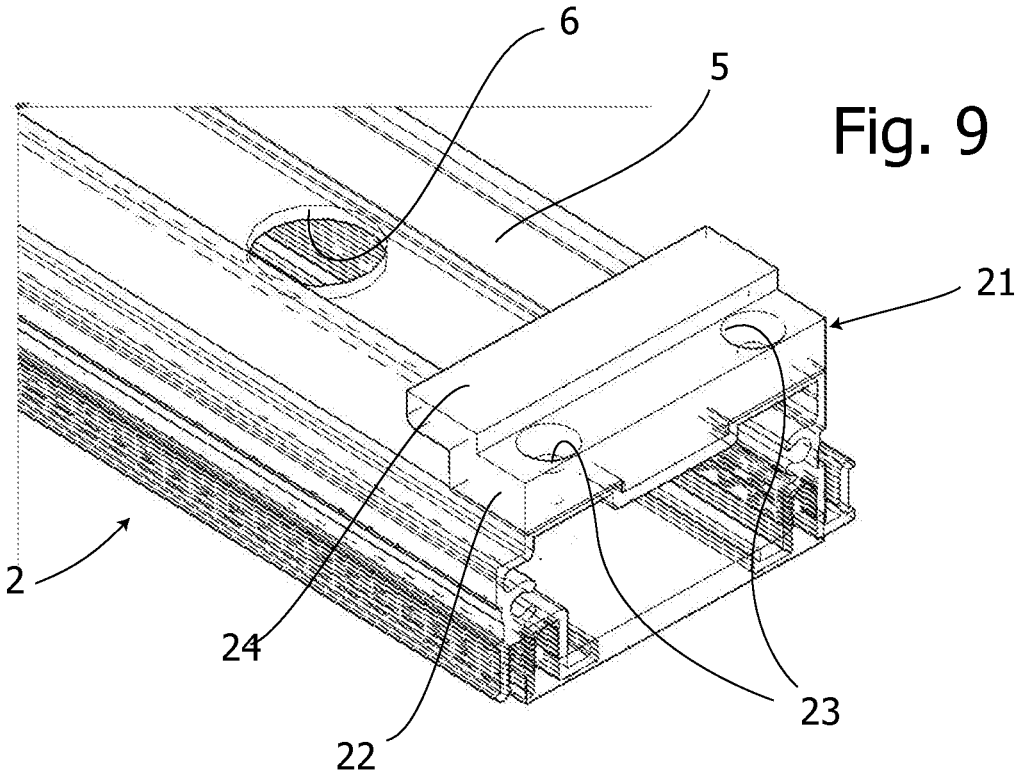


Fig. 9

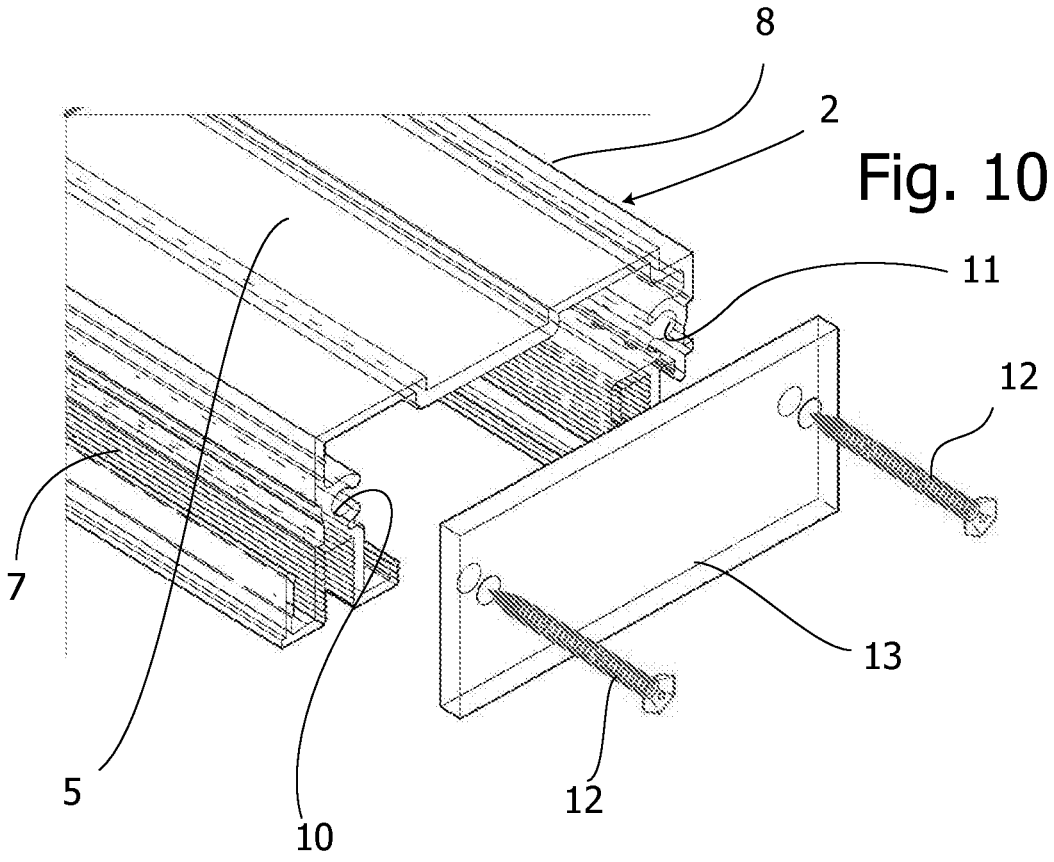


Fig. 10

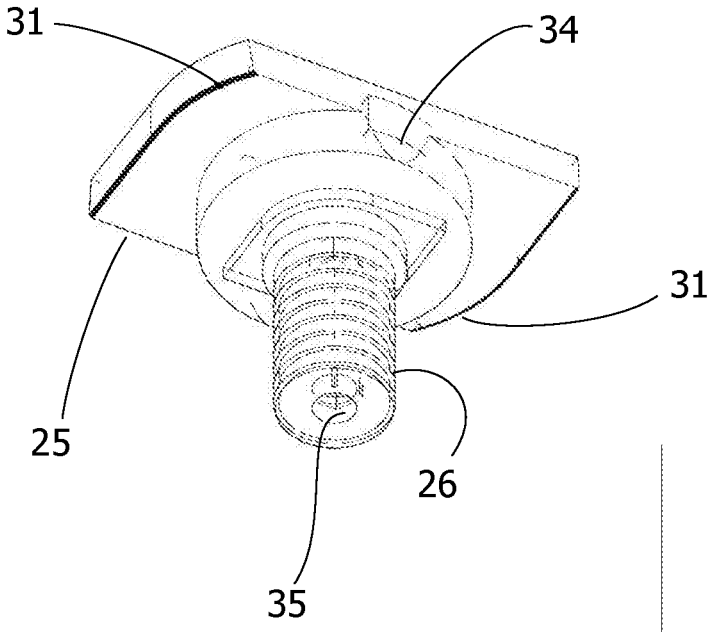


Fig. 11

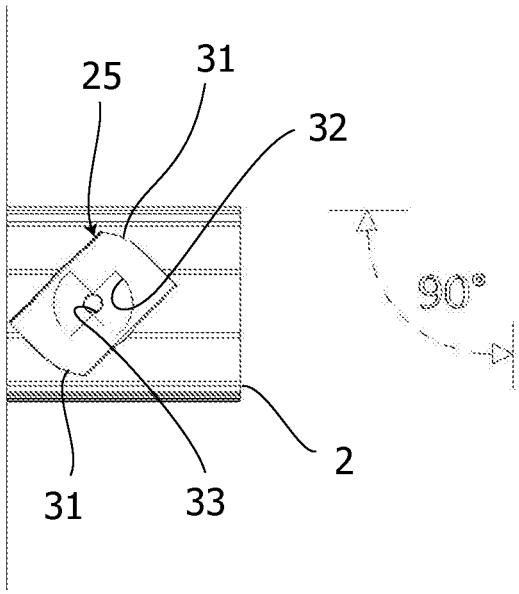


Fig. 12

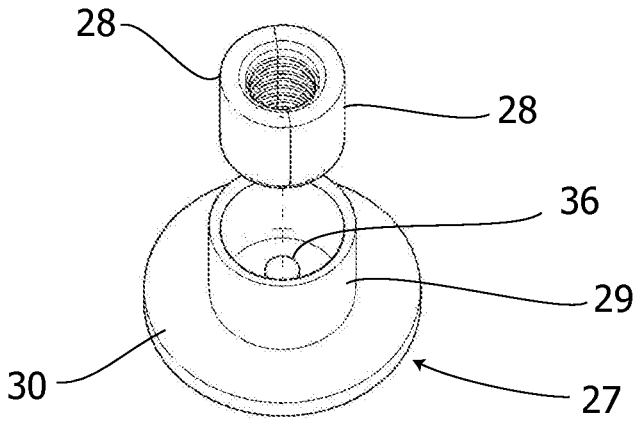


Fig. 13

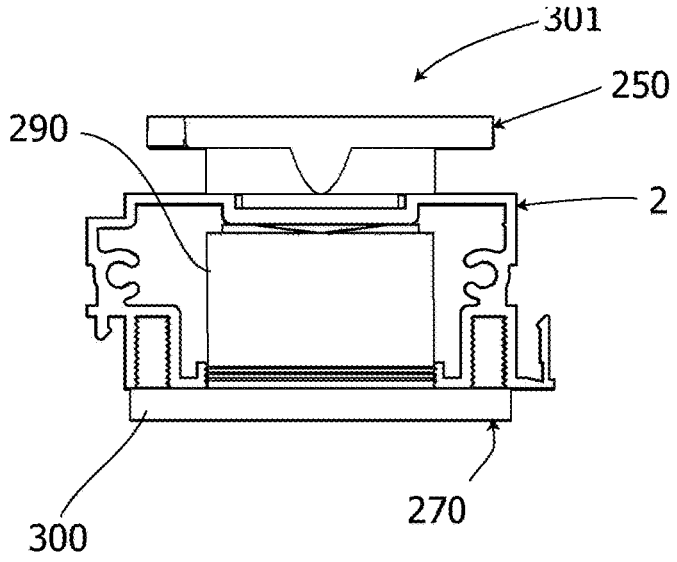

301
250
290
2
300
270

Fig. 14

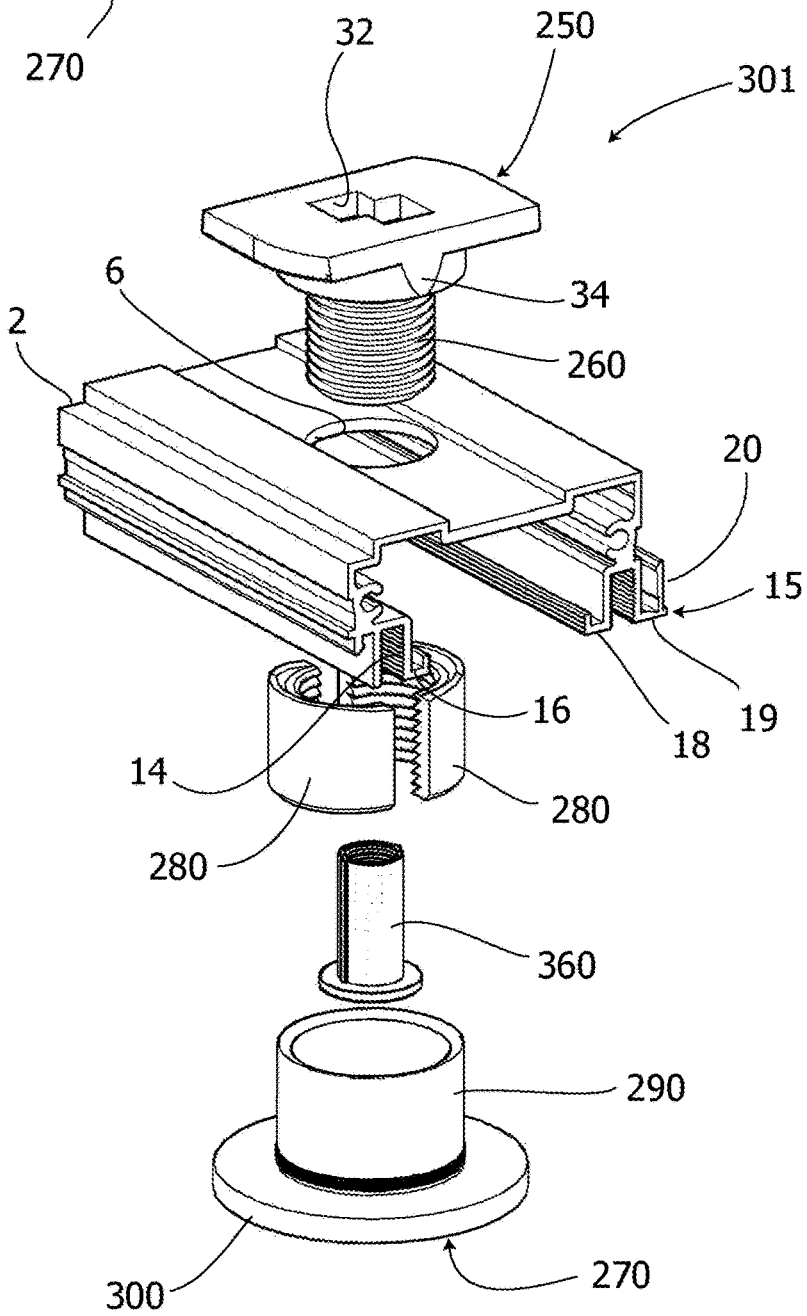

32
250
301
6
34
2
260
20
15
19
18
16
14
280
280
360
290
300
270

Fig. 15

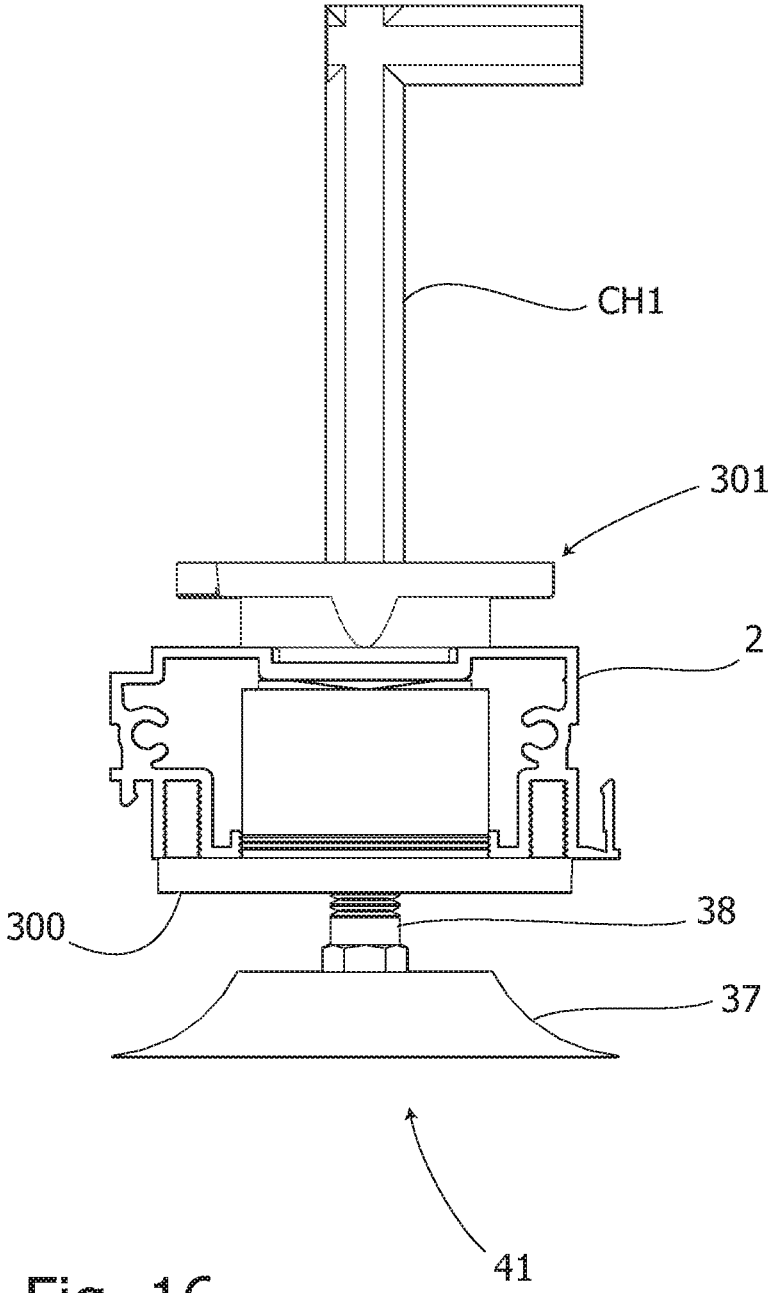
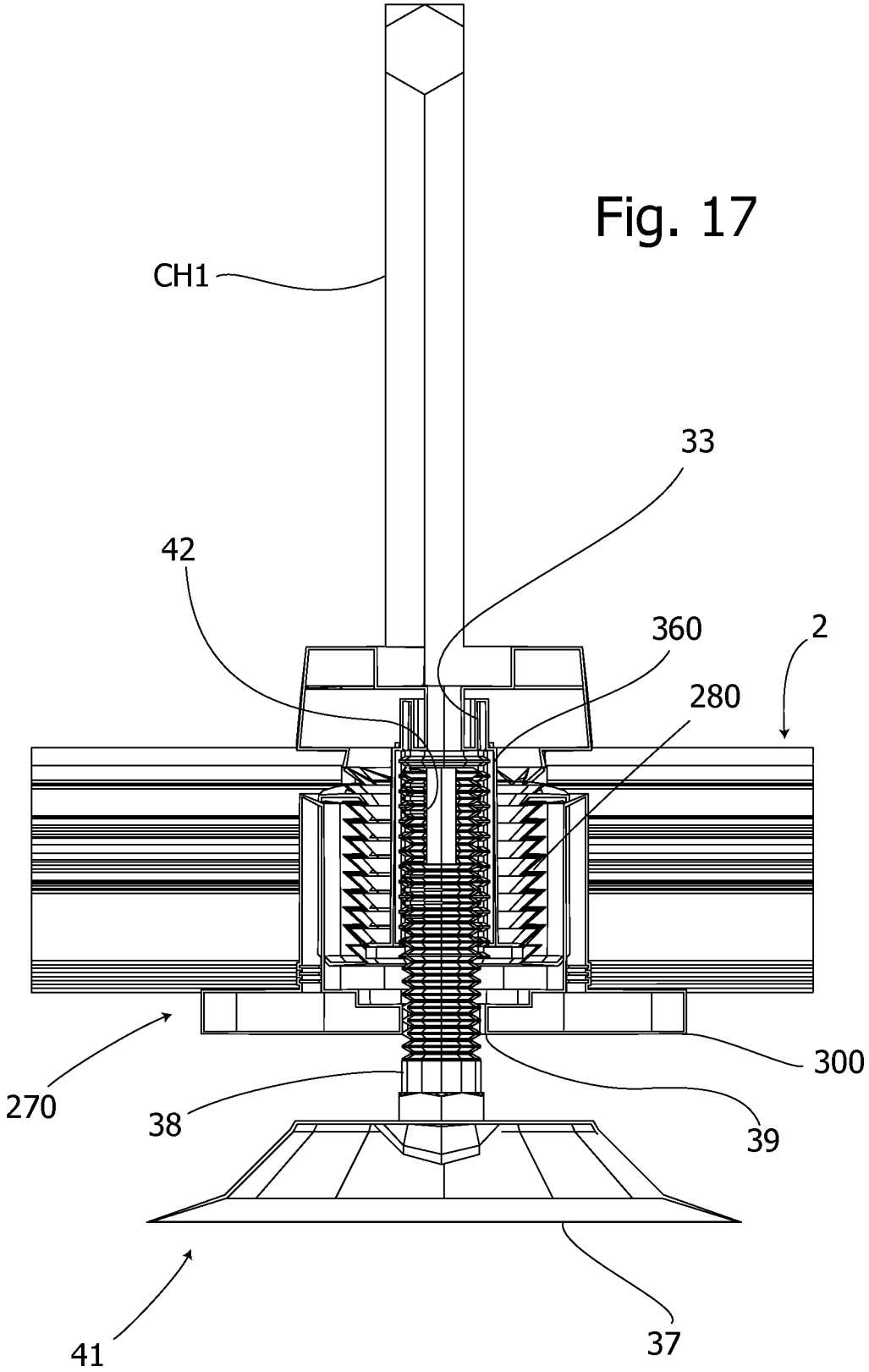


Fig. 16

Fig. 17



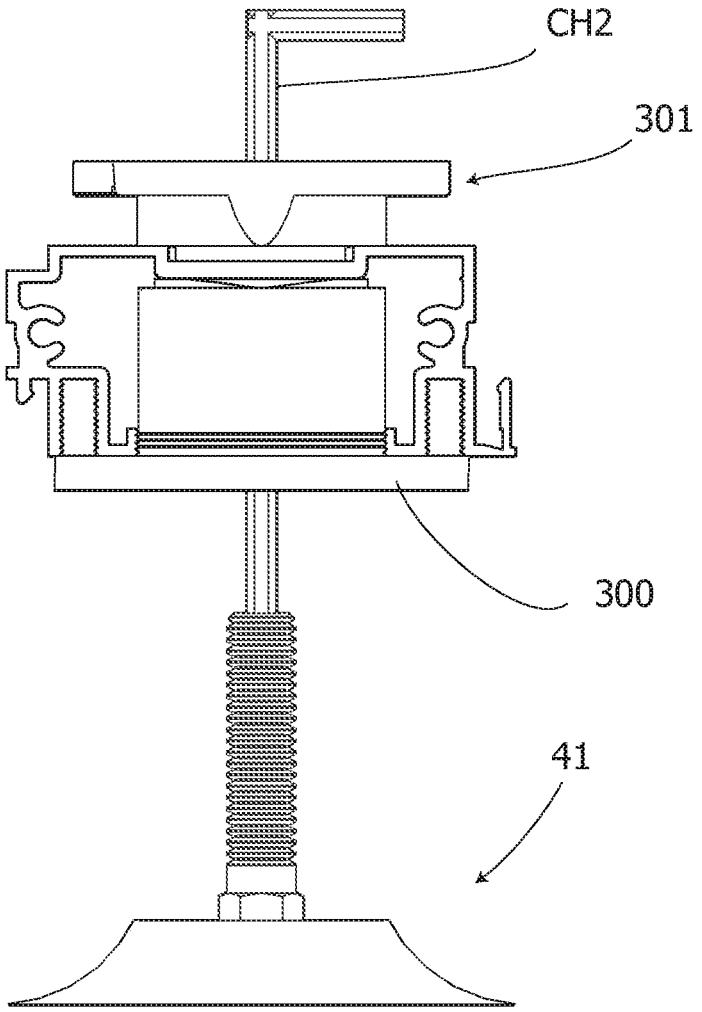


Fig. 18

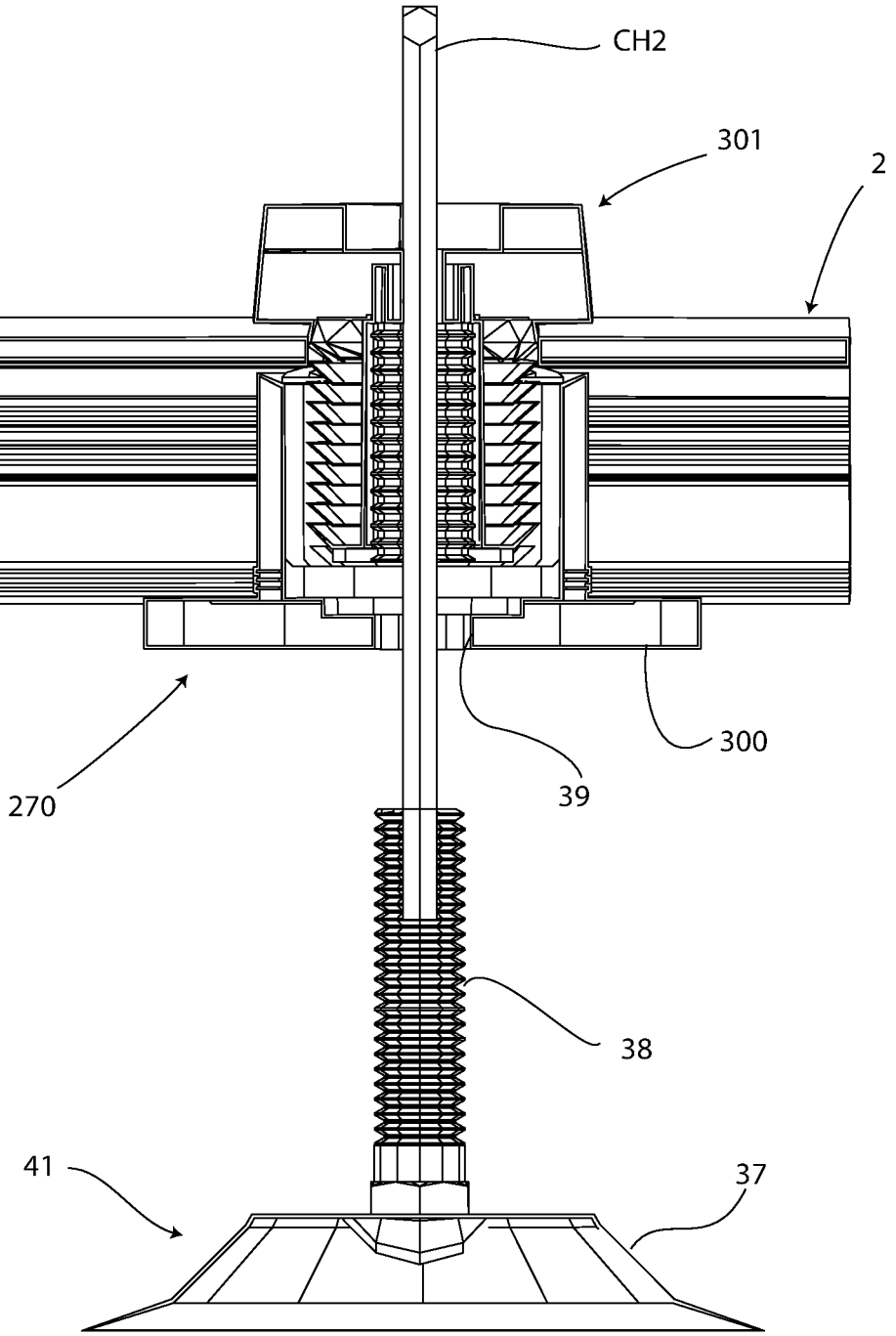


Fig. 19

LEVELING COATING STRUCTURE WITH QUICK INSTALLATION AND REMOVAL

PRIOR ART

[0001] Patent Application No. PCT/1T2008/000065 describes a mounting and dismounting system for wooden slats on a base frame. The removable connection between the wooden slats and the base frame is made by clamps or T-clips. Each T-clip has a rotating stem in a bushing with inserts, the bushing passing through the base frame and ending with a radial extension to abut the bottom of the base frame. The T-clip also has a head to engage a groove formed on the sides of the wooden slat. The head of the T-clip has a butterfly-shaped recess in which a T-shaped key can be inserted to rotate the head of the T-clip in one or another direction and create an engagement or disengagement between the wooden slat and the base frame.

FIELD OF THE INVENTION

[0002] The present invention relates to a leveling structure with quick installation and removal.

[0003] In the above-mentioned PCT application, the base frame is made of strips of wood, in which shaped holes are formed so as to receive the bushing mentioned above.

[0004] This should create a stable connection between the strips of wood and the wooden slats, which are arranged orthogonal to the parallel wooden slats and form a covering.

[0005] However, it has been seen that a coating structure according to the patent application mentioned above has some drawbacks. In the strips of wood, precise seats must be formed to accommodate the bushings of the T-clips. Strips of wood are not stable over time, being subject to deformations due to thermal variations and humidity. The T-clips of the coating structure do not block in a reliable way the wooden slats to the strips of wood of the base frame. Moreover, the coating structure described in the above-mentioned PCT application cannot be leveled with respect to a base surface upon which it is applied. This drawback is particularly relevant when the coating structure is applied to an irregular base surface.

SUMMARY OF THE INVENTION

[0006] The present invention aims to overcome the above-mentioned drawbacks.

[0007] In particular, an object of the invention is to provide, for a coating structure of the aforementioned type, a base frame that is stable over time and convenient to apply.

[0008] Another object of the invention is to provide a reliable connection between the base frame and the covering slats.

[0009] A further object of the invention is to create a readily releasable engagement between connecting elements and slats in a surface coating structure in order to quickly install and remove the slats.

[0010] Yet another object of the invention is to make leveling the coating structure with respect to the base surface to which it is applied.

[0011] These and other objects and advantages are achieved by a leveling, fast-mounting and quick-release coating structure as defined in the main claim and the dependent claims thereof attached to this description.

BRIEF DESCRIPTION OF THE DRAWINGS

[0012] Embodiments of the invention are set forth in the following detailed description, by referring to the accompanying drawings in which:

[0013] FIG. **1** is a perspective view of a coating structure according to the present invention when applied to a vertical wall;

[0014] FIGS. **2** and **3** are partial end views of the coating structure shown in FIG. **1** in two successive positions in mounting a slat to the base frame;

[0015] FIG. **4** is an enlarged scale view of an end portion of the coating structure in FIG. **3**;

[0016] FIG. **5** is a perspective view of a base frame section of the coating structure according to the present invention;

[0017] FIG. **6** is a perspective view of an end of the section in FIG. **5** in an enlarged scale;

[0018] FIG. **7** is an end view of two sections as those in FIG. **6** previously to be flanked;

[0019] FIG. **8** is a perspective view of end of two sections such as those in FIG. **7**, side-by-side and complete with clips;

[0020] FIG. **9** is a perspective end view of a base frame section having a stop element of a slat;

[0021] FIG. **10** is a perspective end view of a base frame section to which a plug is applied:

[0022] FIG. **11** is a perspective view of a clip head with a stem according to a first variant;

[0023] FIG. **12** is a top plan view of the clip head in FIG. **11** with the addition of the indication of its rotation angle;

[0024] FIG. **13** is an exploded perspective view of a first clip bushing variant for the coating structure according to the present invention;

[0025] FIG. **14** is an end view of a base frame section and a second clip variant;

[0026] FIG. **15** is an exploded perspective view of the section and clip in FIG. **14**;

[0027] FIG. **16** is a view of the section and clip in FIG. **14** complete with leveling element in a contracted position and with a first hexagonal male key for rotating the clip head;

[0028] FIG. **17** is a central cross-section of the section and clip in FIG. **16** rotated by 90°;

[0029] FIG. **18** is a view of the section and clip in FIG. **15** complete with an extended positioning element and a second hexagonal male key for rotating the leveling element; and

[0030] FIG. **19** is a central cross-sectional view of the section and clip in FIG. **18** rotated by 90°.

DESCRIPTION OF EMBODIMENTS OF THE INVENTION

[0031] Reference should be made to FIGS. **1** to **3**, which are a perspective view of a coating structure **1** according to the present invention and partial end views thereof, respectively, with two successive positions in mounting a slat to the base frame.

[0032] The coating structure **1** is shown applied to a vertical wall V, but, although not shown, it is also applicable on horizontal surfaces.

[0033] In general, the coating structure **1** has a plurality of parallel sections **2**, a plurality of clamps or clips **3**, and a succession of slats **4**.

[0034] As in the prior art, the plurality of parallel sections **2**, forming a base frame on the base surface of the support plane represented by the vertical wall V, is provided with a

plurality of through holes for receiving the corresponding plurality of clips **3**, which is capable of blocking the succession of slats **4**. This is shown in FIG. **4**, which is an enlarged scale view of an end portion of the coating structure **1**. A clip head **25**, described in greater detail below, is inserted in a lateral groove **40** of a slat **4** of the succession of slats. The slats **4** are known and will not be further described.

[0035] According to the invention, the section **2**, as shown in FIG. **4**, but also in FIGS. **5** and **6**, which are its perspective views, is made of light alloy with a C cross-section.

[0036] The C cross-section of the section **2** has a core **5** supporting the slats, core **5** in which a plurality of through holes **6** and wings **7**, **8** are formed, whose free ends are the bottom of the section.

[0037] The core **5** of the section **2** has a central depression **9** in which the through holes **6** are formed at regular distances.

[0038] The wings **7**, **8** of the section **2** have C-shaped facing recesses **10**, **11**. The recesses **10**, **11** are intended for inserting screws **12** for applying an end cap **13** to the section **2**. This is shown in FIG. **10** which is a perspective view of the end of a base frame section **2**.

[0039] Returning to FIG. **6**, the wings **7**, **8** terminate at the bottom with inverted U-shaped supporting feet **14**, **15**. The supporting foot **14** extends with an orthogonal portion **16** towards the inside of the section **2**, and with an L-shaped angular portion **17** to the outside of the section **2**. The other supporting foot **15** extends with a first orthogonal portion **18** towards the inside of the section **2**, and with a second orthogonal portion **19** towards the outside. The second orthogonal portion **19** continues in a third orthogonal portion **20** upwards to allow a side-by-side joining of a section **2** with another.

[0040] This is shown in FIGS. **7** and **8**, which are an end view of two sections **2** before being flanked and an end perspective view of two sections respectively, as shown in FIG. **7**, being side-by-side and complete with clip **3**. Indeed, in the views of FIGS. **7** and **8**, the L-shaped angular portion **17** has a lower extension downwards than shown in FIG. **6**. However, the function is the same: to allow the insertion of the L-shaped angular portion **17** of the first section **2** in the groove formed in the second section **2** by the supporting foot **15**, by the second orthogonal **19** outwardly and by the third orthogonal portion **20** upwards.

[0041] This side-by-side jointing of two sections **2** is useful when only one slat or, mostly, when a succession of slats **4** terminates with its end over a base frame section **2**. In this case, in fact, only one section **2** would not be enough to cantilever support two consecutive slats.

[0042] Reference is made to FIG. **9** which is an end perspective view of a base frame section **2** to which a useful accessory for the coating structure according to the present invention is applied. The accessory in question is an abutting element **21** with a Z-shaped profile having a lower portion **22** provided with a pair of holes **23** for fixing the abutting element **21** on the outer surface of the core **5** of the base frame section **2** by screws (not shown). Further, the abutting element **21** has an upper portion **24** adapted to fit into the lateral groove **40** of a slat **4**, as shown in FIGS. **2** and **4**. Thus, an end slat of the coating is properly retained.

[0043] As mentioned above, a plurality of clamps or, more simply, clips **3** connects the base frame sections **2** of the coating structure with the succession of slats **4**.

[0044] Reference is made now to FIGS. **11** to **13**, which are a perspective view of a head with stem of a clip, a top perspective view of the clip head with indication of its angle of rotation, and an exploded perspective view of a first variant of the clip bushing.

[0045] Each clip **3** has a head **25** with stem **26** and a bushing **27** with inserts **28**. The stem **26**, which is orthogonal to the head **25**, is inserted into the through hole **6** (FIG. **5**) of the base frame section **2**. The stem **26** is held rotatably by the inserts **28** within the cylindrical wall **29** of the bushing **27**. Below, the inserts **28** are slightly beveled to facilitate their insertion into the cylindrical wall **29**. They are flared above in order to facilitate the connection with the stem **26**.

[0046] The bushing **27** abuts, by its circular plate **30** extending beyond the cylindrical wall **29**, with the inverted U-shaped supporting feet **14**, **15** and corresponding orthogonal portion **16**, first orthogonal portion **18** and second orthogonal portion **19**, opposite to the head **25** of the clip **3**.

[0047] The rotatable engagement between the stem **26** and the inserts **28** is obtained in a known way by means of corresponding ridges and grooves, not marked by reference numerals, in the stem **26** and in the inserts **28**. The head **25** of the clip **3** is prismatic with a rectangular plant that is beveled in opposite vertices **31** to allow a rotation of the head **25** of the clip **3** of only 90° in the engagement with the lateral groove **40** of the slat **4** as shown in FIG. **4**. The indication of this constraint to the rotation of the head **25** with its stem **26** is shown in FIG. **12**, wherein the head **25** is shown as rotated of about 45°, i.e. intermediate between the engagement position with the slat **4** for its locking and a free position.

[0048] The rotation of the head **25** is obtained, as known, by the engagement of a T-key (not shown) with a butterfly-shaped recess **32** formed in the top of the head **25**.

[0049] According to the invention, centrally made in the head **25** is a first hexagonal hole **33** for a hexagonal male key.

[0050] In addition, the clip head **25** is laterally provided with a projection **14** like a downward facing arrow tip to display the head position with respect to the lateral groove **40** of the slat **4**.

[0051] Further, according to the invention, the stem **26** of the clip head **25** is provided with a central hole **35**. As shown in FIG. **13**, in the bushing **27**, coaxially to the stem **26** of the head **25**, a pin **36** is provided internally to the cylindrical wall **29** suitable to fit into the central hole **35** of the stem **26** of the head **25**. The pin **36** inserted in the stem **26** has a retaining effect which makes the presence of the two inserts **28** not indispensable.

[0052] Now, reference is made to FIGS. **14** and **15** which are a side view and an exploded perspective view of the clip in its second variant. As will be seen later, this second variant of the clip can be used, in combination with a threaded foot, to adjust the level of the coating structure relative to the base surface of its support plane.

[0053] Unlike the first variant shown in FIGS. **11** to **13**, whose reference numerals are used for indicating similar components, in the second variant shown in FIGS. **14** and **15**, the clip **301** has a head **250** with stem **260** and a bushing **270** with inserts **280**. The stem **260** is inserted into the through hole **6** of the base frame section **2**.

[0054] The stem **260** is held rotatably by the inserts **280** within the cylindrical wall **290** of the bushing **270**. It is noted that the inserts **280** are slightly beveled at the bottom to

facilitate their insertion into the cylindrical wall **290**. They are flared above to facilitate connection with the stem **260**.

[0055] The bushing **270** abuts, by its circular plate **300** extending beyond the cylindrical wall **290**, with the inverted U-shaped supporting feet **14**, **15** and corresponding orthogonal portion **16**, first orthogonal portion **18** and second orthogonal portion **19**, opposite to the head **250** of the clip **301**.

[0056] According to the second variant, an internally threaded sleeve **360** is provided inside the cylindrical wall **290** of the bushing **270**. Although not shown in FIGS. **14** and **15**, the circular plate **300** of bushing **270** is centrally perforated as shown in FIGS. **16** to **19**, which are views and cross-sections of the section and of the clip complete with a leveling member **41** in a contracted position and with a first hexagonal male key for the rotation of the clip head, and respectively with a second hexagonal male key for the rotation of the leveling member **41**. The leveling member **41** comprises a foot **37** and a corresponding threaded stem **38**.

[0057] The circular plate **300** is provided with a hole **39** so that the threaded stem **38** of the leveling member **41** can pass through the bushing **270** and screw to the threaded sleeve **360** therein. The threaded stem **38** has a lowered hexagonal upper seat **42** to allow the insertion from the top of a hexagonal male key CH**2**, shown in FIG. **18**.

[0058] In the operation of the clip **301** for locking the slats **4** as shown in FIGS. **16** and **17**, a hexagonal male key CH**1** is used that engages the hexagonal seat **33** already shown in FIG. **12**. Thus, the rotation of the head is obtained **250** of the clip **301** for engaging the lateral groove **40** of a slat **4**.

[0059] Instead, in the operation of the clip **301** for adjusting the coating structure level as shown in FIGS. **18** and **19**, the hexagonal male key CH**2** is used that engages the lowered hexagonal upper seat **42** shown in FIG. **17**. In this way, the threaded stem **38** of the foot **37** is rotated, and therefore the raising and lowering of the latter according to the need for adjusting the level of the coating structure according to the present invention is achieved. Such an adjustment can also be made with the installed coating structure.

1-11. (canceled)

12. A leveling coating structure (**1**) with quick installation and removal comprising:

- a plurality of parallel sections (**2**) forming a base frame with its bottom on a supporting plane (V), each section (**2**) being provided with a multiplicity of through holes (**6**);
- a multiplicity of clamps or clips (**3**; **301**), each clip (**3**; **301**) having a head (**25**; **250**) with a stem (**26**; **260**) and a bushing (**27**; **270**) with inserts (**28**; **280**), the stem (**26**; **260**), which is orthogonal to the head (**25**; **250**), being inserted in a through hole (**6**) of the section (**2**) of the base frame and rotatably retained by inserts (**28**; **280**) in the bushing (**27**; **270**) which is in abutment with the bottom of the base frame opposite to the head (**25**; **250**) of the clip (**3**; **301**);
- a succession of slats (**4**) arranged on the parallel sections (**2**) of the base frame at right angles thereto, to form a coating, each of the slats (**4**) having opposite lateral grooves (**40**) which the head (**25**; **250**) of the clip (**3**; **301**) engages;

each section (**2**) being made of light alloy with a C-shaped cross-section having a core (**5**) for supporting the slats (**4**) in which the multiplicity of through holes (**6**) are formed, and wings (**7**, **8**) mutually spaced apart for the insertion of the bushings (**27**; **270**) between them, wherein the wings (**7**, **8**) end at the bottom with U-inverted supporting feet (**14**, **15**), a supporting foot (**14**) extending with a portion (**16**) perpendicular to the inside of the section (**2**) and with an L-shaped angular portion (**17**) towards the outside of the section (**2**), the other supporting foot (**15**) extending with a first portion (**18**) perpendicular to the inside of the section (**2**) and with a second portion (**19**) perpendicular to the outside prosecuting in a third portion (**20**) perpendicular upward, to allow the side by side interlock of a section (**2**) with another.

13. The structure according to claim **12**, wherein each clip (**3**; **301**) is retained by the section (**2**) with the head (**25**; **250**) in abutment with the core (**5**) for supporting the slats (**4**) and the bushing (**27**; **270**) in abutment with the free ends of the wings (**7**, **8**).

14. The structure according to claim **12**, wherein the core (**5**) of the section (**2**) has a swallowed central portion (**9**) in which the through holes (**6**) are formed at regular distances.

15. The structure according to claim **12**, wherein the wings (**7**, **8**) of the section (**2**) have facing C-shaped recesses (**10**, **11**) for application to the section (**2**) of an end plug (**13**) by means of screws (**12**) inserted in such C-shaped recesses (**10**, **11**).

16. The structure according to claim **12**, wherein a Z-shaped abutment element (**21**) has a lower portion (**22**) for fixing with screws on the outer surface of the core (**5**) of the section (**2**) and an upper portion (**24**) adapted to be inserted in the side groove (**40**) of a slat (**4**) for retaining a terminal slat of the coating.

17. The structure according to claim **12**, wherein the head (**25**; **250**) of the clip (**3**; **301**) is prismatic with a rectangular plan that is beveled in opposite vertices (**31**) to allow a rotation of the head (**25**; **250**) of the clip (**3**; **301**) of only 90 degrees in the engagement with the lateral groove (**40**) of the slat (**4**).

18. The structure according to claim **17**, wherein the head (**25**; **250**) of the clip (**3**; **301**) is provided with a downwards facing projection (**34**) showing its position.

19. The structure according to claim **12**, in which the stem (**26**) of the head (**25**) of the clip (**3**) is pierced with a central hole (**35**) in which a stud (**36**) projecting upward integrally with the bushing (**27**) is inserted.

20. The structure according to claim **12**, wherein the head (**25**; **250**) of the clip (**3**; **301**) is provided with a first hexagonal hole (**33**) for engagement with a first hexagonal male key (CH**1**) for the rotation of the head (**25**; **250**) of the clip (**3**; **301**).

21. The structure according to claim **12**, wherein the bushing (**270**) of the clip (**301**) houses an upward projecting pin (**360**), that is drilled and internally threaded, and the base (**300**) of the bushing (**270**) is perforated with a hole (**39**) for the passage of a threaded pin (**38**) combined with a foot (**37**) and adapted to engage said projecting pin (**360**).

22. The structure according to claim **21**, wherein said threaded pin (**38**) with a foot (**37**) has a second hexagonal hole (**42**) for engagement with a second hexagonal male key (CH**2**) for adjusting the height of the base frame with respect to the foot (**37**).

* * * * *