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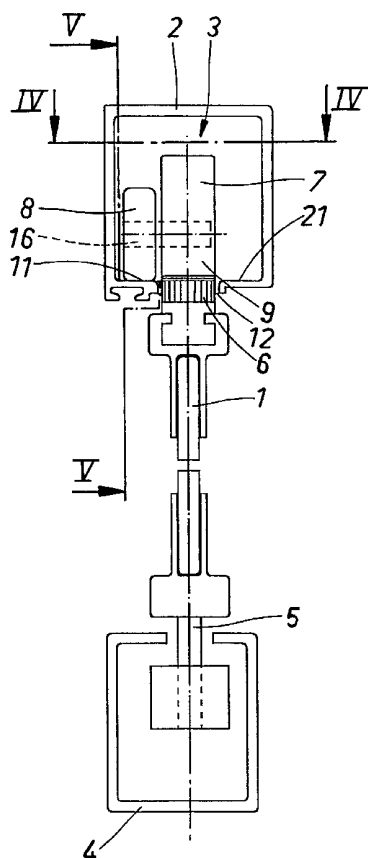
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- (71) Applicant (for all designated States except US): ILOXI OY [FI/FI]; Vaakatie 46, FIN-01640 Vantaa (FI).
- (72) Inventor; and
- (75) Inventor/Applicant (for US only): KARHU, Niilo [FI/FI]; Vaakatie 46, FIN-01640 Vantaa (FI).
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(54) Title: SUPPORT ARRANGEMENT



(57) Abstract: The invention relates to a support arrangement for balcony glazing or a similar movable element (1), the arrangement comprising a first guide rail (2) for two support/wheel units (3) of the element, which are movable in the longitudinal direction of the guide rail and carry substantially the weight of the element (1), and a second guide rail (4) against which a guiding means (5) protruding from the opposite edge with respect to the support/wheel unit (3) of the element (1) is arranged to rest, especially a support arrangement in which the element (1) is arranged to travel on a track which comprises at least two first, and respectively second, guide rails (2, 4) arranged at an angle with respect to each other. The adjacent first, and respectively second, guide rails (2, 4), form a mitre joint (17) with each other. The support/wheel unit (3) comprises a frame part (7), which is supported on the element (1) in a non-pivoting manner, and to which frame part (7) is connected a wheel (8) for supporting and conveying the element (1), and that the first guide rail (2) comprises a groove (12), in which the shaft-like part (6) comprised in the frame part (7) is arranged to move laterally in a controlled manner, and on at least one side of which groove is a guide surface (11) for the wheel (8).



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Support arrangement

The invention relates to a support arrangement for balcony glazing or a similar movable element, the arrangement comprising a first guide rail for two support/wheel units of the element, which are movable in the longitudinal direction of the guide rail and carry substantially the weight of the element, and a second guide rail against which a guiding means protruding from the opposite edge with respect to the support/wheel unit of the element is arranged to rest, especially a support arrangement in which the element is arranged to travel on a track which comprises at least two first, and respectively second, guide rails arranged at an angle with respect to each other.

In a prior art solution - disclosed in the publication WO 99/32752 - is described a solution in which the turning of the wheel construction carrying the element at a corner is achieved by means of additional pieces placed in the corner area of the guide rails. The said solution has the following disadvantages:

- Since the angle between element groups, and thus the guide rails, can be any angle, usually between 180 and 90 degrees, the additional pieces will always have to be made separately for the corner in question.
- The fixing of the small additional pieces to the guide rail must be carried out at the installation stage in construction site conditions and may thus be expensive and unreliable.
- Friction between the additional piece and the wheel may impede the turning process unless the parts in question are lubricated.
- When the wheel turns, it always has to “straighten out” the wheel on the carrying rail section and may thus be left at least partly “in the air”.

The aim of the invention is to eliminate the disadvantages relating to the known solution and to provide a structurally simple, easily made and installed, reliable support arrangement.

This aim has been achieved by means of a support arrangement, which is characterised in that the adjacent first, and respectively second, guide rails, form a mitre joint with each other, that the support/wheel unit comprises a frame part, which is supported on the element in a non-pivoting manner, and to which frame part is connected a wheel for supporting and conveying the element, and that the first guide rail comprises a groove, in which the shaft-like part comprised in the frame part is arranged to move laterally in a controlled manner, and on at least one side of which groove is a guide surface for the wheel.

10

This solution is suitable for use when the first guide rail forms the lower rail of the support arrangement, in which the support/wheel units of the element, and thus the entire element, are supported, and the second guide rail forms the upper rail of the support arrangement, against which the edge opposite with respect to the support/wheel unit of the element is arranged to rest only in the lateral direction. In this type of solution, the guide surface of the support/wheel units can be made uniform and plane-like all over, which means that the support/wheel units have the guide surface available in all their positions.

Especially when the first guide rail forms the upper rail of the support arrangement, in which the support/wheel units of the element, and thus the entire element, are supported, the vertical support of the support/wheel units requires an additional arrangement due to the groove in the first guide rail, in order to prevent the element from shifting in elevation. This additional arrangement is characterised in that outside the shaft-like part in the frame part is a projecting part, the lower surface of which is arranged to rest against the said guide surface of the wheel in the first guide rail and/or one or more separate guide surfaces, when the element is conveyed from the first guide rail, past the connecting point, to the next first guide rail.

30

Further preferable developments of the invention are described in the dependent claims.

The invention is described in greater detail in the following, with reference to the accompanying drawings, in which:

- 5 Figure 1 shows balcony glazing provided with the support arrangement relating to the invention.
- Figure 2 shows a section along line II-II in Figure 1.
- 10 Figure 3 shows a section along line III-III in Figure 1 of a support arrangement according to a first embodiment of the invention.
- Figure 3a shows a section along line III-III in Figure 1 of a support arrangement according to a second embodiment of the invention.
- 15 Figure 3b shows a section along line III-III in Figure 1 of a support arrangement according to a third embodiment of the invention.
- Figure 3c shows a section along line III-III in Figure 1 of a support arrangement according to a fourth embodiment of the invention.
- 20 Figure 3d shows a section along line III-III in Figure 1 of a support arrangement according to a fifth embodiment of the invention.
- Figure 4 shows a diagrammatic section along line IV-IV in Figure 3, at the connecting point of the guide rails.
- 25 Figure 5 shows a section along line V-V in Figure 3.
- Figure 6 shows a section along line VI-VI in Figure 3a.
- 30 Figure 7 shows a section along line VII-VII in Figure 3b.

Figures 1 and 2 show diagrammatically an example of balcony glazing. The support arrangement of the glass elements 1 in this type of balcony glazing

comprises a first guide rail 2 and a second guide rail 4. The first guide rail 2 supports two support/wheel units 3 of the element, which are movable in the longitudinal direction of the guide rail and carry substantially the weight of the element 1. A guiding means 5 protruding from the opposite edge with respect to the support/wheel unit 3 of the element 1 is arranged to rest against the second guide rail 4.

In the examples shown in Figures 3, 3a and 3b, the first guide rail 2 is formed by the upper guide rail and the second guide rail 4 by the lower guide rail. In the example shown in Figures 3c and 3d, on the other hand, the first guide rail 2 is the lower guide rail and the second guide rail 4 is the upper guide rail.

The support arrangement is intended particularly also for the type of case in which the element 1 is arranged according to Figures 1 and 2 to travel on a track which comprises at least two guide rails 2, 4 arranged at an angle with respect to each other.

As seen best in Figure 4, the adjacent first guide rails 2 form a mitre joint with each other. The second guide rails 4 also form a mitre joint with each other. In the example shown in Figure 4, the guide rails 2 are perpendicular to each other, but it is obvious that the angle between the rails 2 can be selected freely.

As seen best in Figure 3, the support/wheel unit 3 comprises a frame part 7 connected at its lower end to the element 1, which frame part is supported on the element in a non-pivoting manner. To the frame part 7 is connected a wheel 8 for supporting and conveying the element 1. The wheel 8 is connected by means of a horizontal shaft 16 to the frame part 7 and arranged to rest against the, most preferably horizontal, guide surface 11 arranged on the guide rail 2.

The first guide rail 2 has a groove 12, in which a shaft-like part 6 comprised in the frame part 7 and having an outer surface which is most preferably a circular cylinder, is arranged to move laterally in a controlled manner. On the other

side of the vertical plane determined by the groove 12 is a guide surface 11 for the wheel 8.

The frame part 7 comprises a projecting part 9 outside the shaft-like part 6, the lower surface 20 of which projecting part is arranged to rest against the said guide surface 11 of the wheel 8 in the first guide rail 2, when the element 1 is conveyed from one guide rail 2, past the connecting point 17, to the next guide rail 2. In addition to, or instead of this, the lower surface 20 may rest against one or more separate guide surfaces; in the example shown in Figure 3 against guide surface 21, and in the examples shown in Figure 3a and 3b against guide surface or guide surfaces 22.

As seen best in Figures 3 and 5, the lower surface 20 of the frame part 7 is dimensioned in such a way that when the element 1 is parallel with the guide rails 2, 4, the lower surface 20 is at the groove 12 of the guide rail 2, and thus separate from the guide surfaces 11, 21. The support/wheel unit 3 of the element 1 is dimensioned in such a way that it will have space to turn inside the first guide rail 2, when conveying the element 1 from one guide rail to another, past the connecting point 17. Since, in addition, the support surface of the wheel 8 settling against the guide surface 11 of the wheel 8, and the said lower surface 20 of the frame part 7 are arranged on essentially the same plane, when the element 1 is conveyed from one guide rail to another, the frame part 7 may rest by its lower surface 20 against the guide surfaces 11 and 21, when the wheel 8 loses its grip on the guide surface 11 in the corner area between two successive guide rails 2.

The support surface of the wheel 8 settling against the guide surface 11 of the wheel 8 and the said lower surface 20 of the frame part 7 may also be arranged on an essentially common conical surface (not shown) with the shaft-like part 6.

In Figures 3a and 6, the projecting part 9 and the lower surface 20 on it are arranged above the wheel 8, which means that an additional guide surface 22 is arranged on the guide rail above the wheel 8. A corresponding guide surface

may also be arranged on the opposite side of the guide rail 2, as shown in broken line.

5 Figures 3b and 7 show a further example in which the projecting part 9 is comprised of a wheel-like piece, which is supported on the frame part 7 in a fixed manner, or alternatively mounted on it rotatably in bearings, the lower surface 20 of the piece being arranged to rest against the guide surface or surfaces marked with reference numeral 22 when the element 1 is conveyed from one guide rail to another.

10

Deviating from the solutions shown in the other Figures, in Figures 3c and 3d the lower guide rail 2 supports the support/wheel units 3 of the element 1, whereby the upper rail 4 only guides in the lateral direction.

15 In Figures 3c and 3d, the support/wheel unit 3 comprises a frame part 7 connected at its upper end to the element 1, the frame part being supported in a non-pivoting manner on the element 1. To the frame part 7 is connected a wheel 8 for supporting and conveying the element 1. The wheel 8 is connected by means of a horizontal shaft 16 to the frame part 7 and arranged to rest
20 against the guide surface 11 forming the horizontal inner lower surface of the guide rail 2. In the case shown in Figure 3d, the said guide surface 11 is a uniform level, whereas in the example shown in Figure 3c, there is a recess 24 in the centre of the surface 11.

25 Corresponding to the example shown in Figures 3 and 5, in Figure 3c, the lower surface 20 of the projecting part 9 of the frame part 7 is dimensioned in such a way that when the element 1 is parallel with the guide rails 2, 4, the lower surface 20 is at the groove 24 of the guide rail 2, and thus separate from the guide surface 11. When the element 1 is conveyed from one guide rail to
30 another, the said lower surface 20 rests against the guide surface 11 and thus prevents the wheel 8, and at the same time the entire element 1, from shifting in elevation.

In the case shown in Figure 3d, the guide surface 11 is uniform and thus the wheel 8 has continuous support from the guide surface 11, which means that the additional support provided by the lower surface 20 of the frame part 7 is unnecessary. In this case, the frame part 7 does not need to comprise the
5 projecting part 9 used in the other embodiments of the invention, whereby also the design of the frame part 7 can be freely selected in this respect.

The support arrangement relating to the invention functions as follows.

10 In Figure 4, the support/wheel units 3 of the element 1 are shown in four different positions I-IV as the element moves past the connecting point 17 of the guide rails 2.

In position I, both support/wheel units 3 of the element 1 are on the straight
15 section of the guide rail 2.

In position II, the left unit 3 is at a corner between two guide rails 2 and partly pulled onto another guide rail, in which case the said unit 3 is no longer supported on the wheel 8, but on the guide surfaces 11, 21 via the parts 23
20 marked in black of the lower surface 20 of the projecting part 9 of the frame part 7.

In positions III and IV, both units 3 are supported on the guide surfaces 11, 21 via the parts marked in black of the lower surface 20 of the projecting part 9 of
25 the frame part 7.

At the following stage (not shown), the element 1 is again parallel with the guide rail 2 and supported only by the wheels 8 on the guide surface 11.

30 When the element 1 is moved in the direction of the guide rail 2, only the wheels 8 support the element 1. On the other hand, when the element 1 is conveyed past the corner area between two guide rails, the support of the element 1 is shifted partly or completely on the lower surface 20 of the projecting part 9 of the frame part 7.

Claims

1. A support arrangement for balcony glazing or a similar movable element (1), the arrangement comprising a first guide rail (2) for two support/wheel units (3) of the element, which are movable in the longitudinal direction of the guide rail and carry substantially the weight of the element (1), and a second guide rail (4) against which a guiding means (5) protruding from the opposite edge with respect to the support/wheel unit (3) of the element (1) is arranged to rest, especially a support arrangement in which the element (1) is arranged to travel on a track which comprises at least two first, and respectively second, guide rails (2, 4) arranged at an angle with respect to each other, the adjacent first, and respectively second, guide rails (2, 4), form a mitre joint (17) with each other, the support/wheel unit (3) comprises a frame part (7), which is supported on the element (1) in a non-pivoting manner, and to which frame part (7) is connected a wheel (8) for supporting and conveying the element (1), and the first guide rail (2) comprises a groove (12), in which the shaft-like part (6) comprised in the frame part (7) is arranged to move laterally in a controlled manner, and on at least one side of which groove is a guide surface (11) for the wheel (8), **characterised** in that there is a projecting part (9) outside the shaft-like part (6) in the frame part (7), the lower surface (20) of the said projecting part being arranged to rest against the said guide surface (11) of the wheel (8) in the first guide rail (2) and/or one or more separate guide surfaces (21, 22) when the element (1) is conveyed from the first guide rail (2), past the connecting point, (17) to the next first guide rail (2).

25

2. A support arrangement as claimed in claim 1, **characterised** in that the lower surface (20) of the frame part (7) is dimensioned in such a way that when the element (1) is parallel with the guide rails (2, 4), the lower surface (20) is at the groove (12) of the guide rail (2), and thus separate from the guide surfaces (11, 21).

30

3. A support arrangement as claimed in claim 1, **characterised** in that the support surface of the wheel (8) settling against the guide surface (11) of the

wheel (8), and the said lower surface (20) of the frame part (7) are arranged on essentially the same plane.

4. A support arrangement as claimed in claim 1, **characterised** in that the
5 support surface of the wheel (8) settling against the guide surface (11) of the wheel, and the said lower surface (20) of the frame part (7) are arranged on an essentially common conical surface.

5. A support arrangement as claimed in claim 1, **characterised** in that the said
10 separate guide surface is formed by the guide surface (21) of the guide rail (2) groove (12) on the opposite side with respect to the guide surface (11) of the wheel (8).

6. A support arrangement as claimed in claim 1, **characterised** in that the said
15 separate guide surface is formed by a guide surface (22) arranged at a distance in elevation of the element (1) from the guide surface (11) of the wheel (8).

7. A support arrangement as claimed in claim 1, **characterised** in that the
20 support/wheel unit (3) of the element (1) is dimensioned in such a way that it will have space to turn inside the first guide rail (2) when conveying the element (1) from one guide rail to another.

8. A support arrangement as claimed in claim 1, **characterised** in that the
25 rotation axis (16) of the wheel (8) is essentially horizontal.

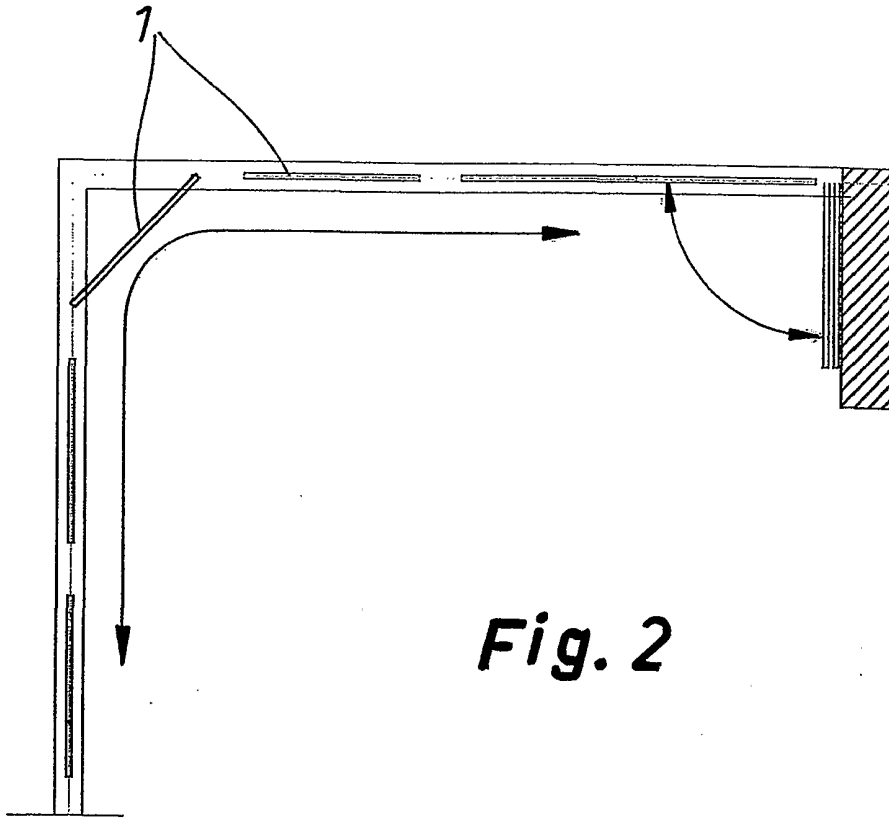


Fig. 2

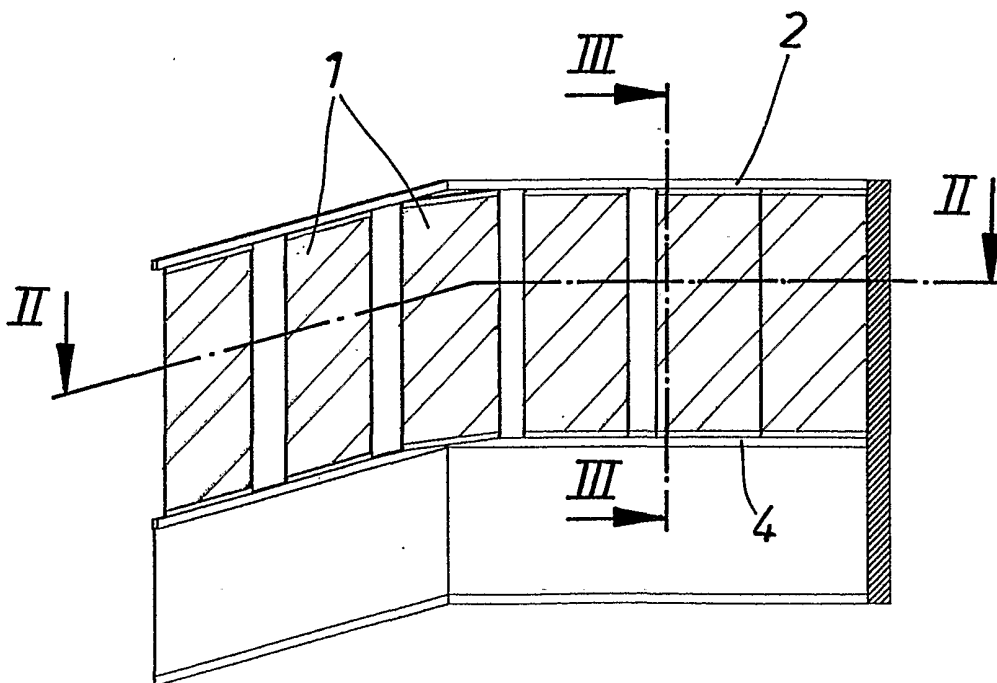


Fig. 1

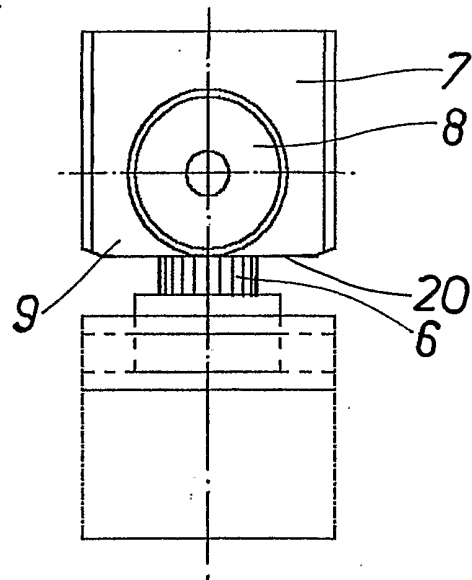
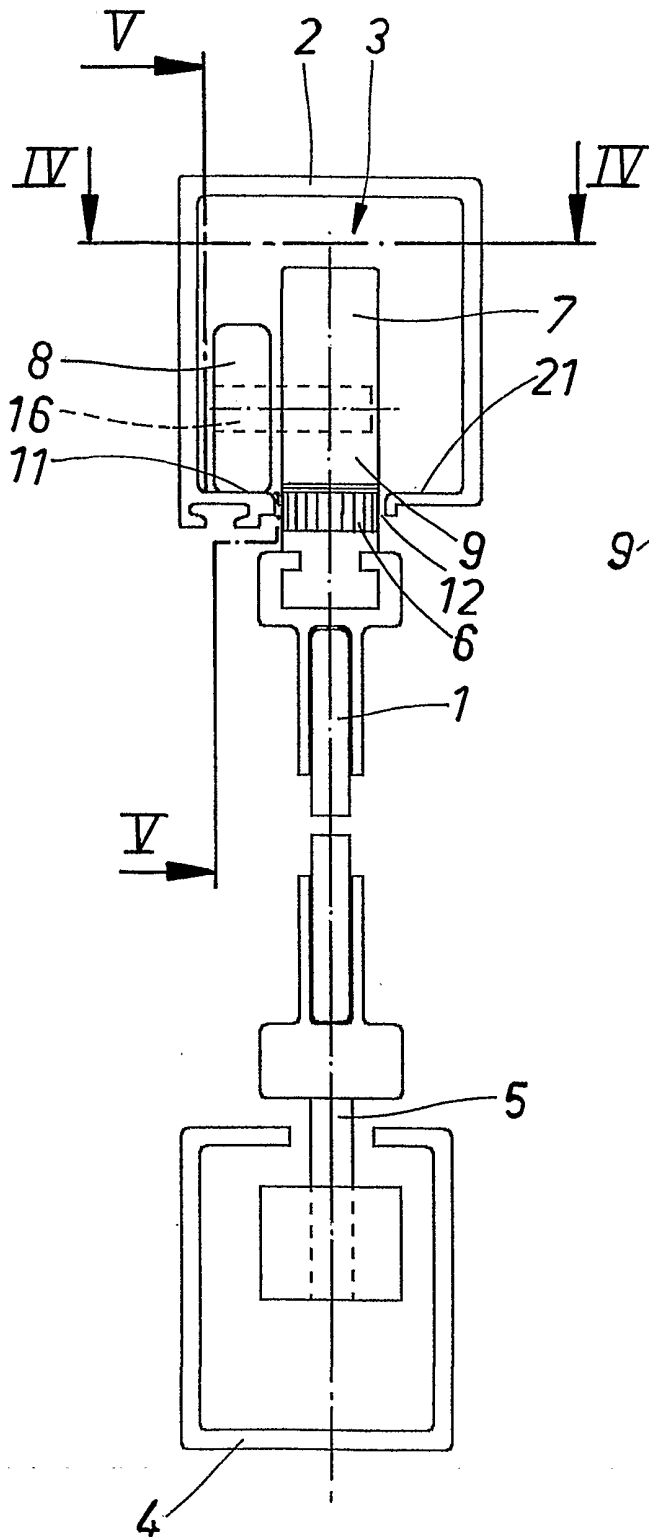


Fig. 5

Fig. 3

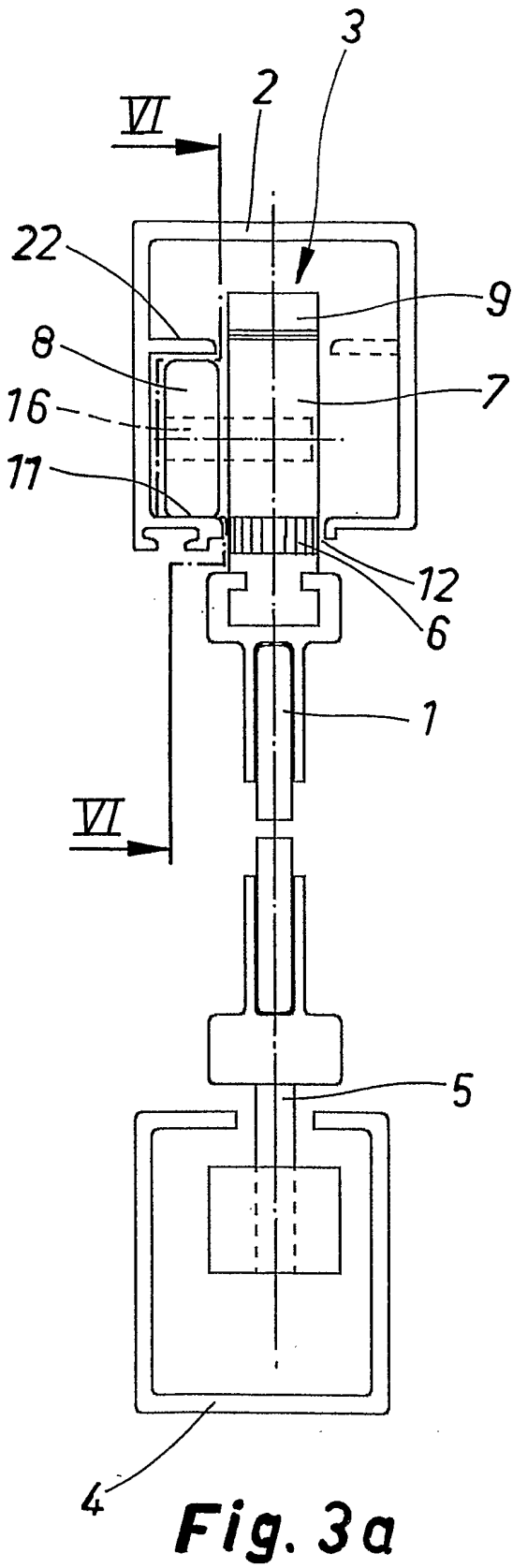


Fig. 3a

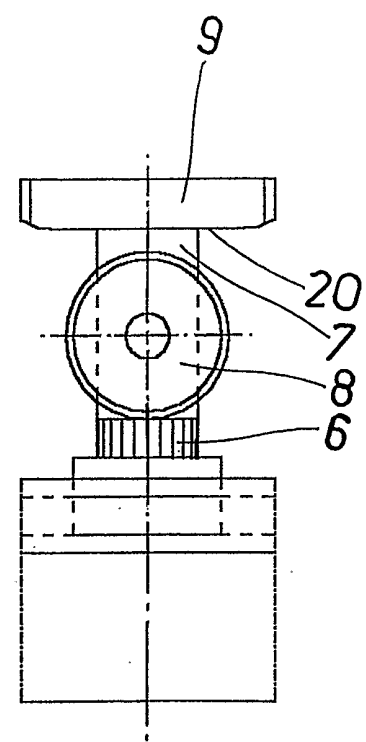


Fig. 6

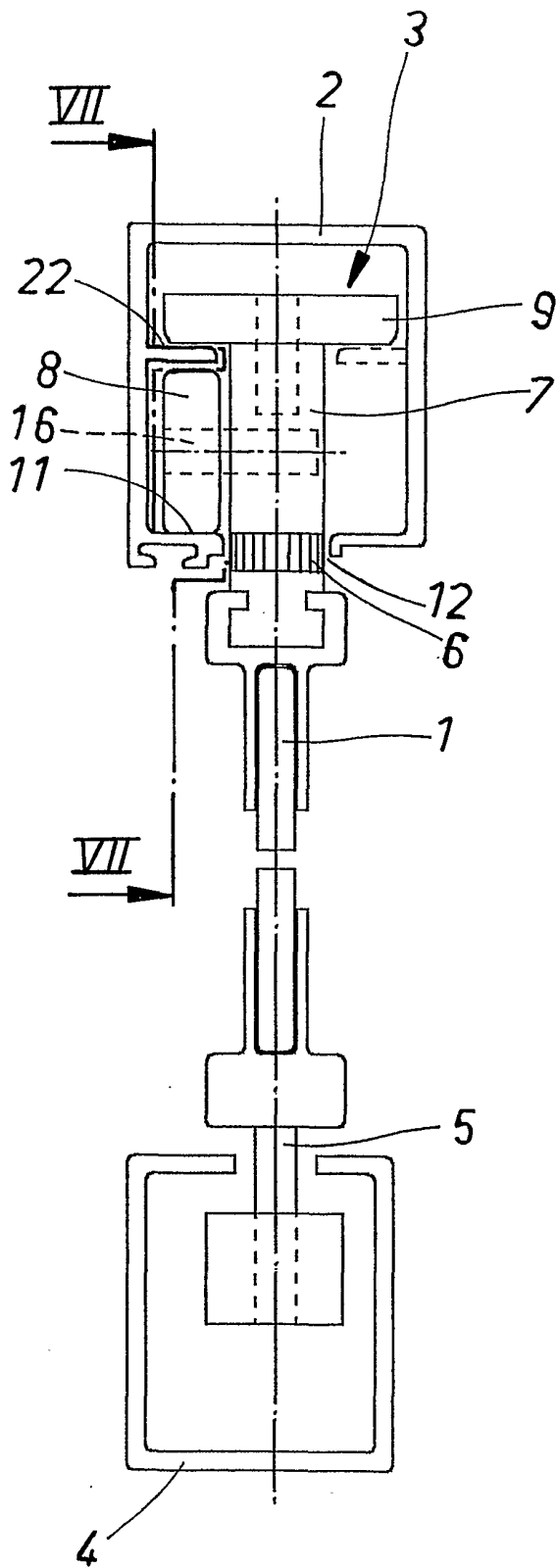


Fig. 3b

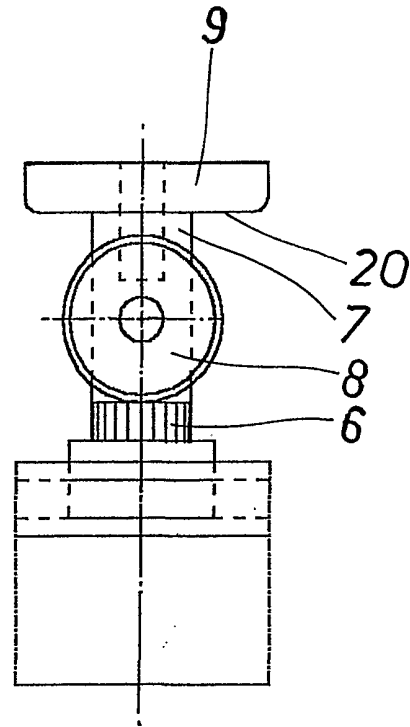


Fig. 7

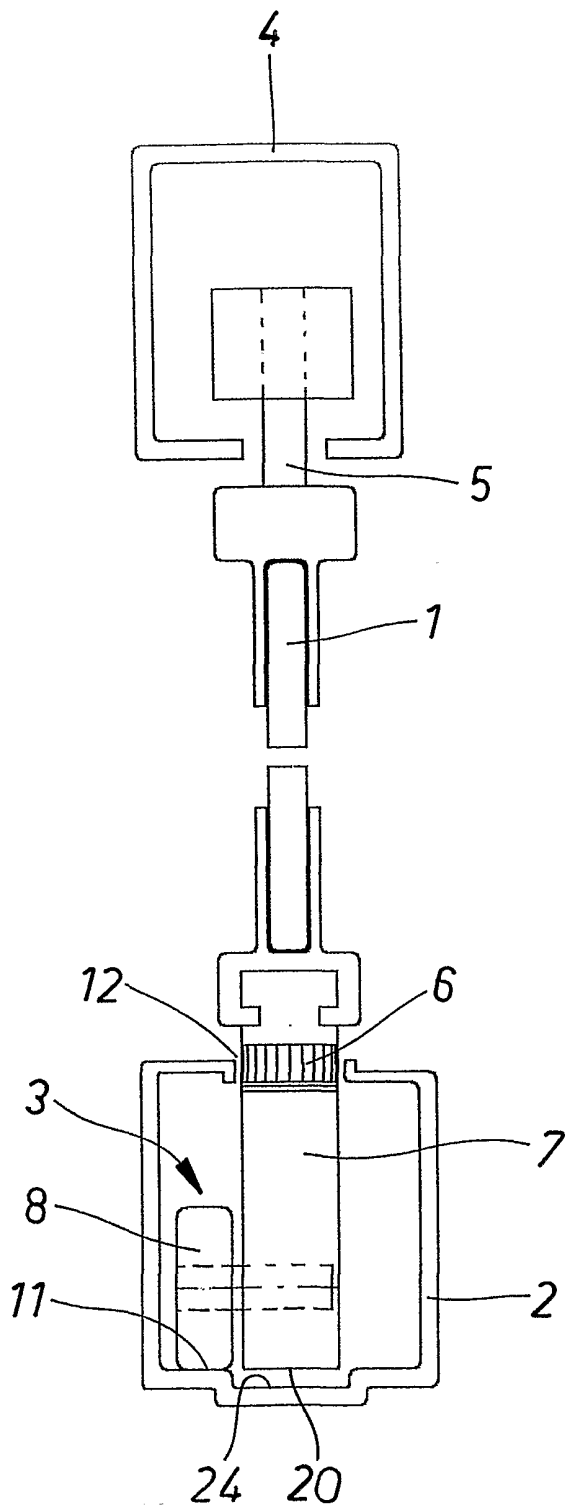


Fig. 3c

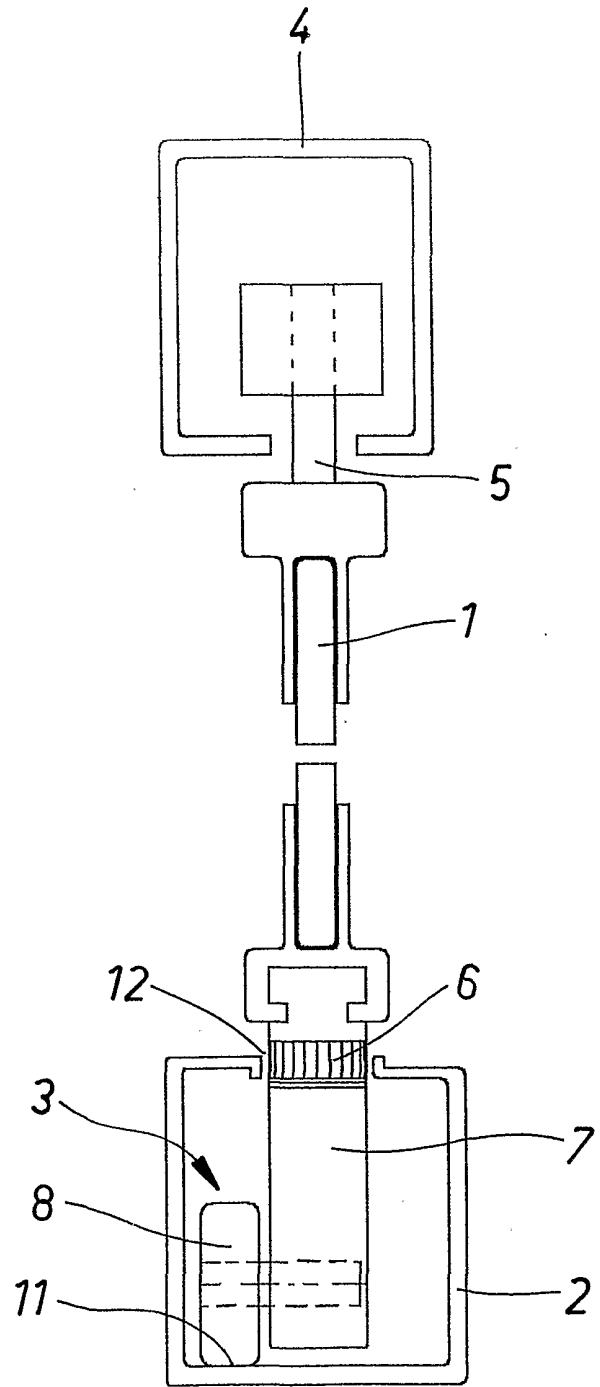


Fig. 3d

INTERNATIONAL SEARCH REPORT

International application No.

PCT/FI 01/00675

A. CLASSIFICATION OF SUBJECT MATTER

IPC7: E06B 3/50, E04B 1/00, E05D 15/06

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC7: E06B, E04B, E05D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

SE,DK,FI,NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 9419570 A1 (GLOBAL FINANCIAL LTD.), 1 Sept 1994 (01.09.94), figure 4, abstract --	1-8
A	WO 9711247 A1 (NIKA SVENSKA AB), 27 March 1997 (27.03.97), figures 1,2, abstract -- -----	1-8

 Further documents are listed in the continuation of Box C.
 See patent family annex.

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Vilho Juvonen / MRO
Telephone No. +46 8 782 25 00

INTERNATIONAL SEARCH REPORT

Information on patent family members

01/10/01

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