



(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
03.01.2007 Bulletin 2007/01

(51) Int Cl.:
A47F 5/10 (2006.01)

(21) Application number: **05013998.9**

(22) Date of filing: **29.06.2005**

(84) Designated Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IS IT LI LT LU MC NL PL PT RO SE SI SK TR
Designated Extension States:
AL BA HR LV MK YU

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(54) **A display rack comprising a vertical post and a base**

(57) A display rack comprises at least one vertical post (2) and a base (4) adapted to be mounted to the vertical post (2). A locking element (6) is adapted to have a first position, in which openings (36) in a first vertical wall (34) of the vertical post (2) are unblocked such that each hook (14) of the base (4) may be inserted through

the corresponding opening (36) until an end (12) of the base (4) abuts a first side (92) of the first vertical wall (34). The locking element (6) is further adapted to have a second position in which a shoulder (62) on the locking element (6) extends into a recess (30) of the hook (14) at a second side (94) of said first vertical wall (34) and locks the hook (14) in the inserted position.

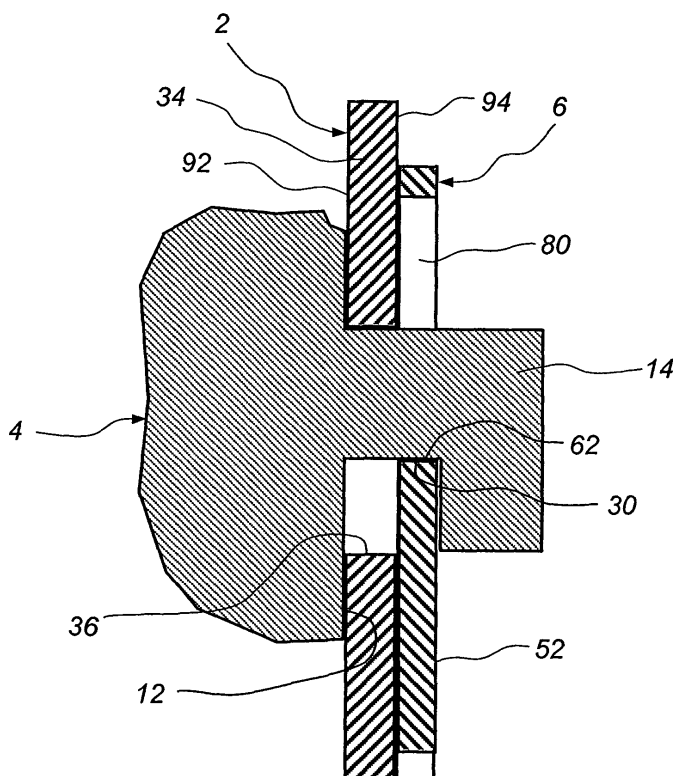


Fig. 7b

Description

Field of the invention

[0001] The present invention relates to a display rack comprising at least one vertical post and a base adapted to be mounted to a lower end of the vertical post.

Background of the invention

[0002] In shops and stores the articles that are for sale are often displayed on a display rack. The display rack often comprises one or several vertical posts, to which shelves may be attached, and a base for each post. The bases support the vertical posts such that the display rack can support a heavy load on the shelves without causing the display rack to tip over. An example of such a display rack is shown in US 6,439,401.

[0003] A problem with the display rack shown in US 6,439,401 is that the base is expensive to manufacture and complicated to mount on the vertical posts.

Summary of the invention

[0004] An object of the present invention is to provide a display rack which has a base which is simple and easy to mount to a vertical post, still providing a secure construction preventing the display rack from tipping over.

[0005] This object is achieved by a display rack according to the preamble and characterized in the vertical post comprising at least two openings formed in a first vertical wall of the vertical post and located at its lower end, the base being provided with at least two hooks which extend from an end of the base and which are adapted to be fitted into one opening each, each hook being adapted to be moved through the corresponding opening from a first side of the first vertical wall and to extend through the opening at a second side of the vertical wall, each hook being provided with a recess which, when the hook extends through the opening, opens vertically downwards at the second side of the vertical wall, the display rack further comprising a locking element having a central portion and at least two shoulders extending from the central portion, the locking element being adapted to be inserted into the lower end of the vertical post so as to be located at the second side of said first vertical wall, the locking element being adapted to have a first position, in which the openings in the first vertical wall are unblocked such that each of the hooks may be inserted through the corresponding opening until said end of the base abuts said first side of the first vertical wall, and a second position in which each one of said shoulders extend into the recess of the corresponding hook at said second side of said first vertical wall and locks the corresponding hook in an inserted position such that the base is securely fixed to the vertical post.

[0006] An advantage with this display rack is that it is very easy to mount and that it requires a minimum amount

of parts, which decreases manufacturing costs. A further advantage is that the locking element provides a very stable and secure attachment of the base to the vertical post.

[0007] According to a preferred embodiment the locking element is U-shaped, said central portion forming a first upright part of the U-shaped locking element, a web connecting the first upright part with a second upright part. An advantage with this embodiment is that the locking element is cheap to manufacture and is easy to mount in a correct position.

[0008] According to a preferred embodiment an adjustment screw for adjusting the position of the display rack in relation to a floor is rotatably connected to said locking element. An advantage of this measure is that adjustability is achieved in a very cost efficient way. Another advantage is that the risk that the locking element is unintentionally moved out of position is minimized since the display rack rests on the adjustment screw, thereby securing the locking element in its second position.

[0009] Preferably the locking element comprises a foot on which the vertical post rests when the locking element is in its second position. An advantage of this embodiment is that the locking element is prevented from being unintentionally moved from the second position. Further the need for a separate foot on the vertical post is omitted.

[0010] According to one preferred embodiment the vertical post has a second vertical wall, opposite to said first vertical wall, the second vertical wall being provided with openings for receiving the hooks of a second base, such that said vertical post may be supported by two bases extending in different directions. An advantage of this is that the vertical post could be supported in two directions. This is of particular importance in display racks where shelves are to be mounted on two opposite sides. Still more preferably one and the same, U-shaped, locking element is adapted for locking both said bases.

[0011] Preferably at least two hooks of the base are located vertically above each other in a first column of hooks, the locking element comprising at least two shoulders located vertically above each other and forming a column of shoulders, the shoulders being separated by cut-outs, the vertical height of each cut-out matching the vertical height of the corresponding hook. An advantage of this embodiment is that the hooks may enter the openings when the locking element is in its first position, due to the cut-outs separating the shoulders, and that the shoulders may then lock both hooks when the locking element is in its second position.

[0012] According to a preferred embodiment the hooks of the base are arranged in at least two parallel columns of hooks. An advantage of this embodiment is that a very stable connection between the base and the vertical post is achieved. Still more preferably the two parallel columns of hooks comprise totally at least four hooks for providing an even more stable connection.

[0013] Preferably the base is made of sheet metal, the

hooks being formed from said sheet metal integrally with said base, said openings in the vertical post being elongated slots extending in a vertical direction and being adapted to receive said hooks. This provides a stable, yet cost efficient, design of the display rack.

[0014] These and other aspects of the invention will be apparent from and elucidated with reference to the embodiments described hereinafter.

Brief description of the drawings

[0015] The invention will now be described in more detail with reference to the appended drawings in which:

Fig. 1 is a perspective view and shows a display rack prior to being mounted.

Fig. 2a is a partial perspective view and shows a base.

Fig. 2b is a partial perspective view and shows the base of Fig. 2a as seen from another direction.

Fig. 3a is a partial perspective view and shows a lower end of a vertical post.

Fig. 3b is a side view and shows the lower end of the vertical post.

Fig. 4a is a side view and shows a U-shaped locking element.

Fig. 4b is a side view of the locking element, as seen along the arrow IVb in Fig. 4a.

Fig. 4c is a perspective view of the locking element.

Fig. 5a is a side view and shows the lower end of the vertical post when the locking element is in its first position.

Fig. 5b is a perspective view of the lower end of the vertical post when the locking element is in its first position.

Fig. 6a is a side view and shows the lower end of the vertical post when the locking element is in its second position.

Fig. 6b is a side view and shows the base locked to the vertical post by means of the locking element.

Fig. 6c is an enlarged side view and shows the base locked to the vertical post.

Fig. 7a is a schematic cross-section and illustrates a first step of the principle by which the locking element locks the base to the vertical post.

Fig. 7b is a schematic cross-section and illustrates a second step of the principle by which the locking element locks the base to the vertical post.

Fig. 8 is a perspective view and illustrates an adjustment screw being threaded in a web of the locking element.

Fig. 9 is a schematic side view and illustrates a vertical post having two bases attached thereto.

Description of preferred embodiments

[0016] Fig. 1 shows a display rack 1. The display rack 1 comprises a vertical post 2, a base 4 and a locking

element 6. The vertical post 2 is a beam formed from a piece of steel plate that has been bent to a rectangular profile. The vertical post 2 is provided with a plurality of apertures 7 to enable the mounting of shelves, not shown, on the vertical post 2 in a similar manner as is per se known from US 6,439,401 and other documents. The vertical post 2 is further provided with perforations 8 adapted for the mounting of a panel, not shown, extending to a not shown second vertical post, which is parallel to the vertical post 2, in a similar manner as is also per se known from US 6,439,401.

[0017] Fig. 2a and 2b illustrate a part of the base 4 as seen in two different perspectives. The base 4 comprises a support 10 made of two bent sheet metal pieces that have been joined to each other, for example by being riveted or welded to each other. The support 10 is adapted to prevent the display rack 1 from tipping over. The horizontal length of the support 10 is adapted to the expected load and vertical height of the display rack. The support 10 is at one end 12 provided with three hooks 14, 16, 18 arranged in a first column 20 of hooks, and three hooks 22, 24, 26 arranged in a second column 28 of hooks, the second column 28 being parallel with the first column 20 of hooks. The vertical height H of each hook 14, 16, 18 etc. is the vertical distance from the upper portion of the hook to the lower portion of the hook, as is illustrated in Fig. 2b. The hooks 14, 16, 18, 22, 24, 26 are formed from the same sheet metal as the support 10 and are thus integrally formed with the support 10, and thus with the base 4. As is best seen in Fig. 2b each hook is provided with a recess 30.

[0018] Fig. 3a and 3b illustrates a lower end 32 of the vertical post 2. The lower end 32 has a first vertical wall 34 which is provided with openings in the form of three elongated slots 36, 38, 40 extending in the vertical direction and arranged in a first column 42 of slots, and three elongated slots 44, 46, 48 extending in the vertical direction and arranged in a second column 50 of slots, the second column 50 being parallel with the first column 42. The first and second columns 42, 50 of slots match the first and second columns 20, 28 of hooks as will be described below. A shortest distance between the slots of the first column 42 and those of the second column 50 is denoted DS. The vertical height of the slots 36, 38 etc. is denoted VH and matches the vertical height H of the hooks 14, 16 etc.

[0019] The vertical post 2 has a second vertical wall, which is hidden in Fig. 3a and 3b, is located opposite to the first vertical wall 34 and is provided with a second set of slots, being identical to the slots of the first vertical wall 34, such that the hooks 14, 16 etc. of the base 4 may be inserted from either side of the vertical post 2.

[0020] Fig. 4a, 4b and 4c illustrate the locking element 6 in greater detail. As is best shown in Fig. 4a the locking element 6 has the shape of a "U" and has a first upright part 52 and a second upright part 54. The upright parts 52, 54 are connected by means of a central web 56. The lowest portion of the web 56 forms a foot 58 which is

adapted to support the vertical post 2 as will be described below. The outer distance D between the first and second upright parts 52, 54 is adapted to provide a slip fit to the internal walls of the lower end 32 of the vertical post 2 when the locking element 6 is inserted into the vertical post 2, as will be described below.

[0021] As is best shown in Fig. 4b the upright part 52 has a central portion 60. Three horizontal shoulders 62, 64, 66 project from one side of the central portion 60 and form a first column 68 of shoulders. Three shoulders 70, 72, 74 project from the opposite side of the central portion 60 and form a second column 76 of shoulders. The shoulders of the first and second columns 68, 76 match each other and form pairs that correspond to the slots 36, 38 etc. of the vertical post 2 and the hooks 14, 16 etc. of the base 4. The shoulders 62, 64, 66 are separated by cut-outs 80, 82, 84 and the shoulders 70, 72, 74 are separated by cut-outs 86, 88, 90. The width W of the central portion 60 in the region of the cut-outs, i.e. the width W from the cut-out 84 to the cut-out 90, is substantially the same as the shortest distance DS between the slots of the first column 42 and the slots of the second column 50, as indicated in Fig. 3b. The vertical height HC of each cut-out 80, 82, 84 etc. is substantially the same as the vertical height VH of the corresponding slot 36, 38 etc. shown in Fig. 3b.

[0022] As shown in Fig. 4c the second upright part 54 has a pattern of shoulders and cut-outs that is similar to that of the first upright part 52. In fact the first and second upright parts 52, 54 are identically shaped as regards shoulders and cut-outs.

[0023] Fig. 5a and 5b illustrate the lower end 32 of the vertical post 2 after the locking element 6 has been inserted from below to have a first position. In this first position the cut-outs 80, 82, 84, 86, 88, 90 of the locking element 6 are located such that they match the slots 36, 38, 40, 44, 46, 48 of the first vertical wall 34. Thus the shoulders 62, 64, 66, 70, 72, 74 are located at the lower end of the respective slot 36, 38 etc. When the locking element 6 has this first position a minor portion of the upright parts 52, 54 extend out of the lower end 32 of the vertical post 2. The slots 36, 38 etc. in the first vertical wall 34 are unblocked and thus the hooks 14, 16 etc. of the base 4 can be inserted into the slots 36, 38 etc. without any obstruction. It will be appreciated that since the vertical height VH of each slot 36, 38 etc. correspond to the vertical height H of the corresponding hook 14, 16 etc. the base 4 need not be angled but can be moved in a normal direction towards the vertical post 2 when inserting the hooks 14, 16 etc. into the slots 36, 38 etc.

[0024] Fig. 6a-6c illustrate a situation when the locking element 6 has been brought to a second position in which the locking element 6 locks the base 4 to the vertical post 2.

[0025] Fig. 6a indicates how the locking element 6 has been forced to its second position. For reasons of clarity the base 4 is not shown in Fig. 6a. In this second position the vertical post 2 rests on the foot 58 formed on the

locking element 6. When the vertical post 2 is located on a floor the locking element 6 is locked between the floor and the vertical post 2 and cannot be accidentally removed. As shown in Fig. 6a the shoulders 62, 64 etc. of the locking element 6 blocks part of the slots 36, 38 etc. When the locking device 6 has been brought to this second position the base 4 is locked to the vertical post 2, as is illustrated in Fig. 6b, and thus the display rack 1 is mounted and ready for attaching shelves, panels etc. as the case may be.

[0026] Fig. 6c illustrates in more detail how the foot 58 of the locking element 6 rests on the floor F and thereby locks the hooks 22, 24, 26 etc. of the base 4.

[0027] Fig. 7a and 7b are schematic cross-sections that further illustrate the principle according to which the locking element 6 locks the base 4 to the vertical post 2.

[0028] Fig. 7a illustrates the situation when the locking element 6 is in its first position. The vertical wall 34 of the vertical post 2 has an outer first side 92 and an inner second side 94. As described earlier the locking element 6 is located inside the vertical post 2 and thus its upright part 52 is located adjacent to the second side 94 of the vertical wall 34. As the locking element 6 is located in its first position the shoulder 62 is located flush with the lower end of the slot 36, the cut-out 80 in the upright part 52 matching the slot 36. Thus the slot 36 is unblocked and the hook 14 can easily be inserted through the slot 36 until the end 12 of the base 4 abuts the first side 92 of the vertical wall 34. In this position the recess 30 opens vertically downwards at the second side 94 of the vertical wall 34. As is evident from Fig. 7a the hook 14 enters into the cut-out 80 of the locking element 6 and thus the locking element 6 cannot, once the hook 14 has passed through the slot 36, be removed from the vertical post 2 without first removing the hook 14.

[0029] Fig. 7b illustrates the situation after the locking element 6 has been brought from its first to its second position. In the situation shown in Fig. 7b, where the locking element 6 is in its second position, the shoulder 62 of the upright part 52 extends into the recess 30 of the hook 14. Thus the shoulder 62 of the locking element 6 locks the hook 14 in the slot 36, such that the base 4 is secured to the vertical post 2. As long as the display rack stands on a floor the locking element 6 will remain in this second position, since the display rack stands on the foot 58 of the locking element 6, and thus the base 4 will be safely secured to the vertical post 2.

[0030] It will be appreciated that the display rack may be dismounted by first lifting the display rack from the floor such that the locking element 6 can be brought from its second position to its first position. The hook 14 is thereby released and the base 4 can be removed from the vertical post 2. After the base 4 has been removed the locking element 6 can be taken out of the vertical post 2, whereby the display rack is completely dismounted.

[0031] Fig. 8 illustrates an embodiment in which an adjustment screw 96 is threaded through a threaded hole 97 in the web 56 of the locking element 6. Since the entire

display rack rests on the locking element 6, in this embodiment being provided with the adjustment screw 96, the adjustment 96 screw can be used for tuning the height of the display rack. In cases where a display rack comprises two or more vertical posts, each being attached to a base by means of a locking device, the adjustment screw could be used for tuning the display rack to be level.

[0032] Fig. 9 illustrates schematically an embodiment where one base 4 has been attached to a first vertical wall 34 of the vertical post 2 and a second base 98 has been attached to the second vertical wall 100 of the vertical post 2. In this way the vertical post 2 cannot tip over to the right or to the left, as it is shown in Fig. 9. It will be appreciated that the two bases 4, 98 are preferably attached to the vertical post 2 by means of the locking element 6 shown in Fig. 4a-4c.

[0033] It will be appreciated that numerous modifications of the above illustrated embodiments are possible within the scope of the appended claims.

[0034] The locking element 6 and the vertical post 2 illustrated above are designed so as to enable the mounting of a base 4 to either side of the vertical post 2, or to both sides of the post 2. It will be appreciated that it is also possible to design a display rack in which a base may only be mounted on one specific side of the vertical post.

[0035] Yet another possibility is to design a vertical post having slots in three vertical sides, or in all four vertical sides, such that three, or four, bases could be mounted on the vertical post. In such a case a locking element would be provided with three or four upright parts each being provided with shoulders and cut-outs.

[0036] Above it has been described how the hooks of the base are made from a steel plate. It will be appreciated that other alternatives are also possible. For instance a hook could be made from a pin in which a recess has been formed. A further possibility is to bend a rod to obtain a hook having a recess.

[0037] To summarize a display rack 1 comprises at least one vertical post 2 and a base 4 adapted to be mounted to the vertical post 2. A locking element 6 is adapted to have a first position, in which openings 36 in a first vertical wall 34 of the vertical post 2 are unblocked such that each hook 14 of the base 4 may be inserted through the corresponding opening 36 until an end 12 of the base 4 abuts a first side 92 of the first vertical wall 34. The locking element 6 is further adapted to have a second position in which a shoulder 62 on the locking element 6 extends into a recess 30 of the hook 14 at a second side 94 of said first vertical wall 34 and locks the hook 14 in the inserted position.

Claims

1. A display rack comprising at least one vertical post (2) and a base (4) adapted to be mounted to a lower end (32) of the vertical post (2), **characterised in**

the vertical post (2) comprising at least two openings (36, 38, 40, 44, 46, 48) formed in a first vertical wall (34) of the vertical post (2) and located at its lower end (32), the base (4) being provided with at least two hooks (14, 16, 18, 22, 24, 26) which extend from an end (12) of the base (4) and which are adapted to be fitted into one opening (36, 38, 40, 44, 46, 48) each, each hook (14, 16, 18, 22, 24, 26) being adapted to be moved through the corresponding opening (36, 38, 40, 44, 46, 48) from a first side (92) of the first vertical wall (34) and to extend through the opening (36, 38, 40, 44, 46, 48) at a second side (94) of the vertical wall (34), each hook (14, 16, 18, 22, 24, 26) being provided with a recess (30) which, when the hook (14, 16, 18, 22, 24, 26) extends through the opening (36, 38, 40, 44, 46, 48), opens vertically downwards at the second side (94) of the vertical wall (34), the display rack (1) further comprising a locking element (6) having a central portion (60) and at least two shoulders (62, 64, 66, 70, 72, 74) extending from the central portion (60), the locking element (6) being adapted to be inserted into the lower end (32) of the vertical post (2) so as to be located at the second side (94) of said first vertical wall (34), the locking element (6) being adapted to have a first position, in which the openings (36, 38, 40, 44, 46, 48) in the first vertical wall (34) are unblocked such that the each hook (14, 16, 18, 22, 24, 26) may be inserted through the corresponding opening until said end (12) of the base (4) abuts said first side (92) of the first vertical wall (34), and a second position in which each one of said shoulders (62, 64, 66, 70, 72, 74) extend into the recess (30) of the corresponding hook at said second side (94) of said first vertical wall (34) and locks the corresponding hook in an inserted position such that the base (4) is securely fixed to the vertical post (2).

2. A display rack according to claim 1, wherein the locking element (6) is U-shaped, said central portion (60) forming a first upright part (52) of the U-shaped locking element (6), a web (56) connecting the first upright part (52) with a second upright part (54).

3. A display rack according to claim 1 or 2, wherein an adjustment screw (96) for adjusting the position of the display rack (1) in relation to a floor (F) is rotatably connected to said locking element (6).

4. A display rack according to any one of claims 1 to 3, wherein the locking element (6) comprises a foot (58) on which the vertical post (2) rests when the locking element (6) is in its second position.

5. A display rack according to any one of claims 1-4, wherein the vertical post (2) has a second vertical wall (100), opposite to said first vertical wall (34), the second vertical wall (100) being provided with open-

ings for receiving the hooks of a second base (98), such that said vertical post (2) may be supported by two bases (4, 98) extending in different directions.

6. A display rack according to claim 5, wherein the locking element (6) is U-shaped and has two upright parts (52, 54) being connected by a web (56), each of the upright parts (52, 54) being provided with shoulders (62, 64, 66, 70, 72, 74) adapted to extend into recesses (30) of corresponding hooks (14, 16, 18, 22, 24, 26) of a first base (4) and a second base (98), respectively, for locking the bases (4, 98) in position on the vertical post (2). 5
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7. A display rack according to any one of claims 1-6, wherein at least two hooks (14, 16, 18) of the base (4) are located vertically above each other in a first column (20) of hooks, the locking element (6) comprising at least two shoulders (62, 64, 66) located vertically above each other and forming a column (68) of shoulders, the shoulders (62, 64, 66) being separated by cut-outs (80, 82, 84), the vertical height (HC) of each cut-out matching the vertical height (H) of the corresponding hook (14, 16, 18). 15
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8. A display rack according to any one of claims 1-7, wherein the hooks (14, 16, 18; 22, 24, 26) of the base (4) are arranged in at least two parallel columns (20, 28) of hooks. 30

9. A display rack according to claim 8, wherein the two parallel columns (20, 28) of hooks comprise totally at least four hooks. 35

10. A display rack according to any one of claims 1-9, wherein the base (4) is made of sheet metal, the hooks (14, 16, 18, 22, 24, 26) being formed from said sheet metal integrally with said base, said openings in the vertical post (2) being elongated slots (36, 38, 40, 44, 46, 48) extending in a vertical direction and being adapted to receive said hooks. 40
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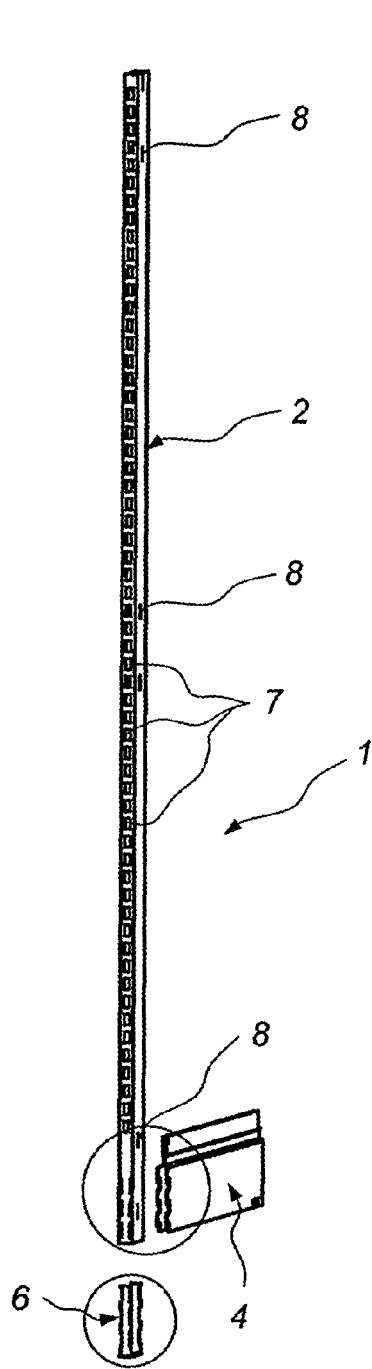


Fig. 1

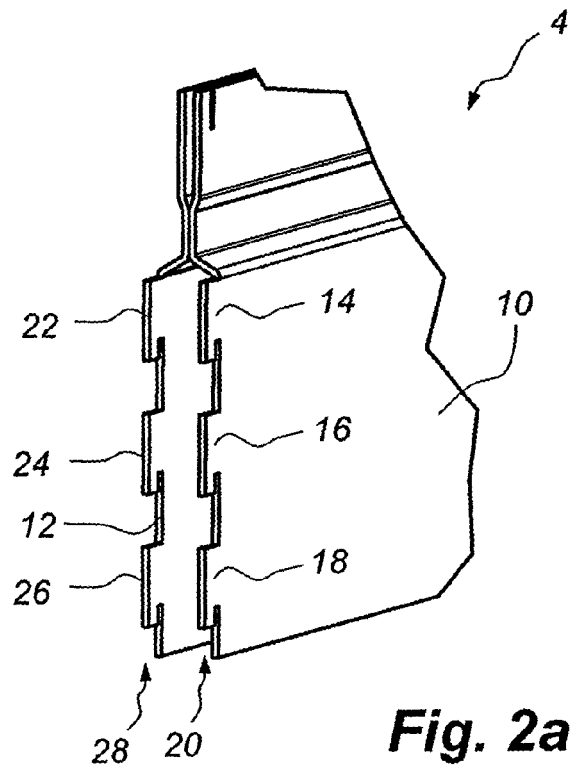


Fig. 2a

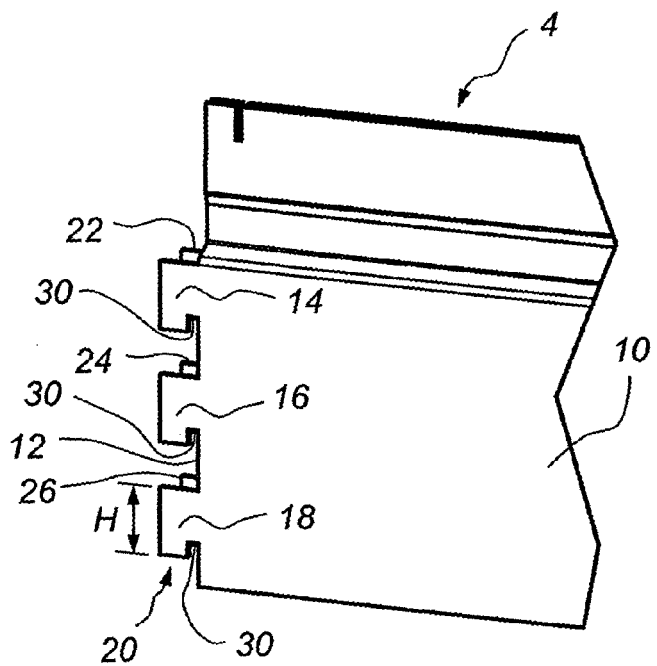


Fig. 2b

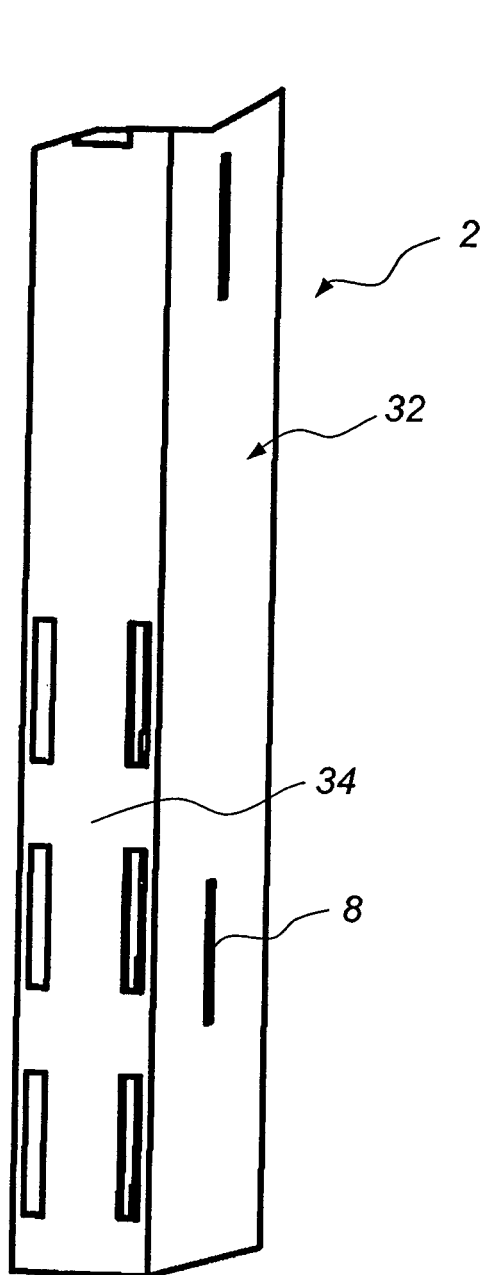


Fig. 3a

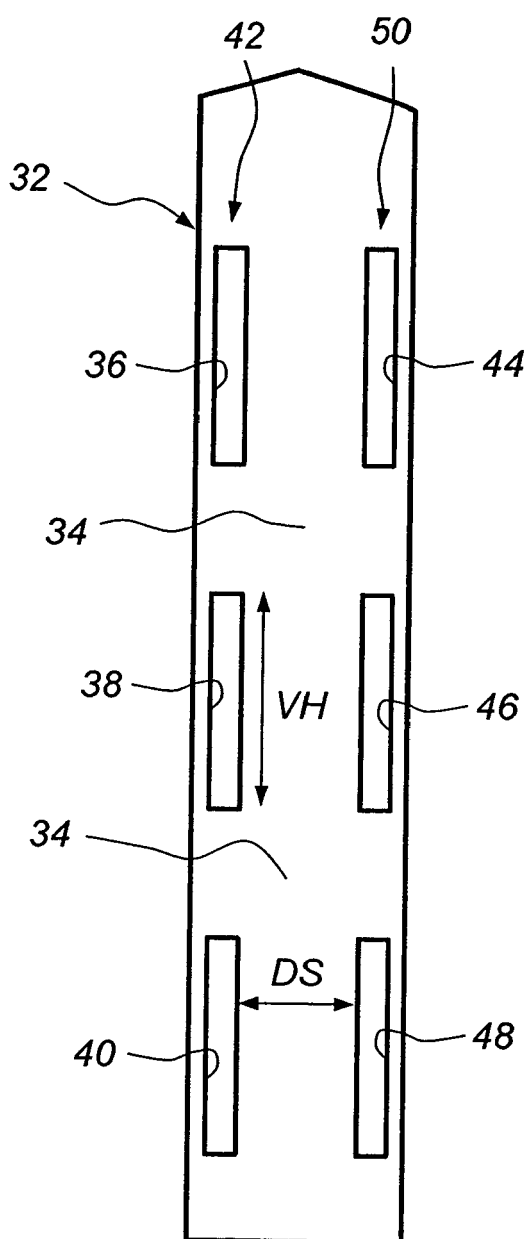


Fig. 3b

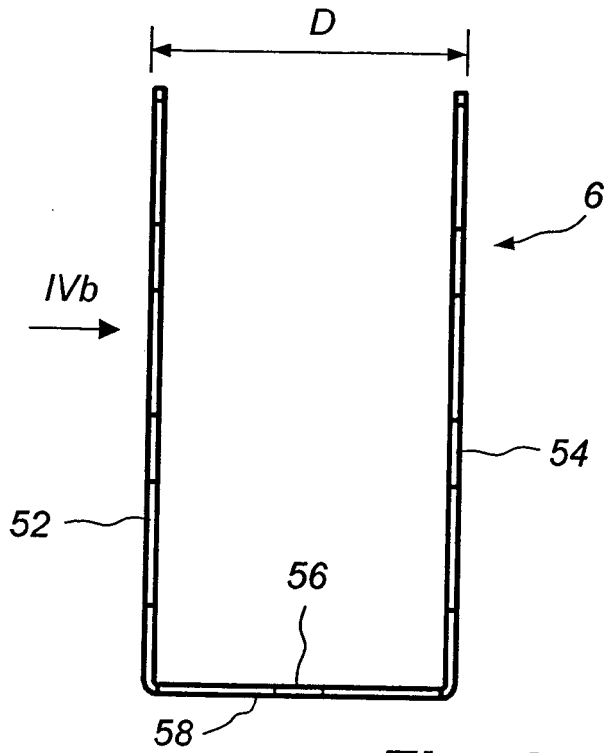


Fig. 4a

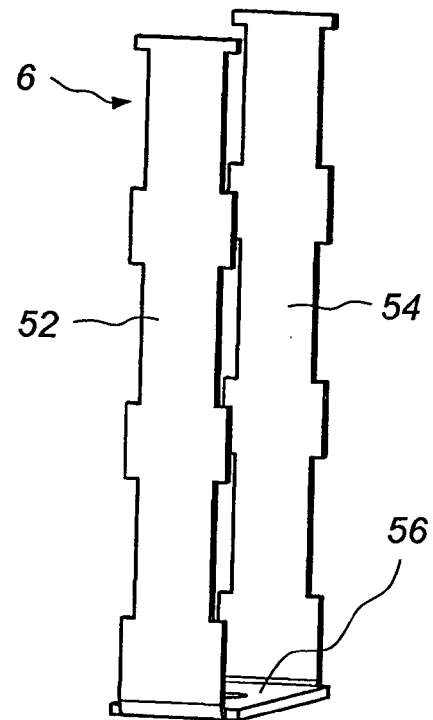


Fig. 4c

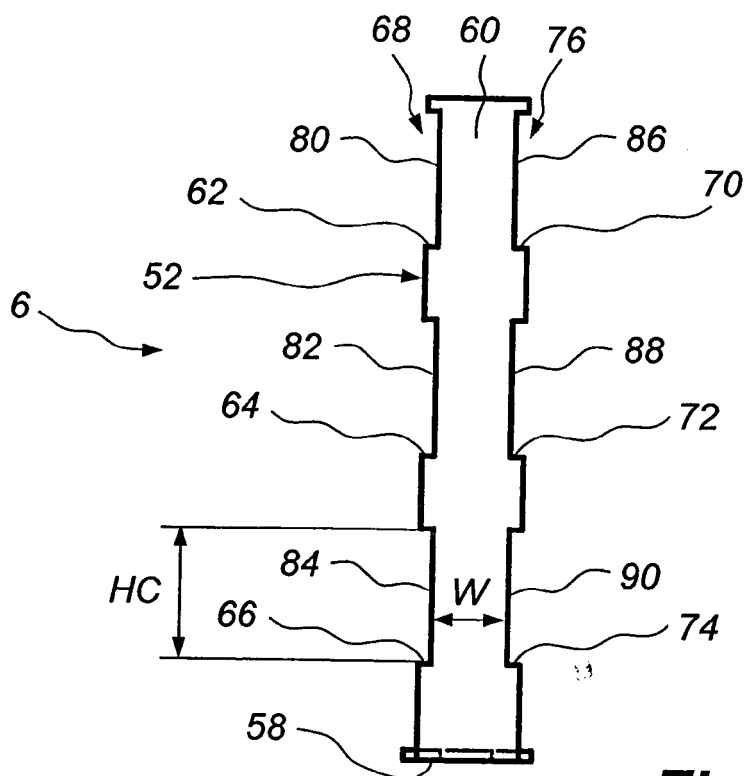
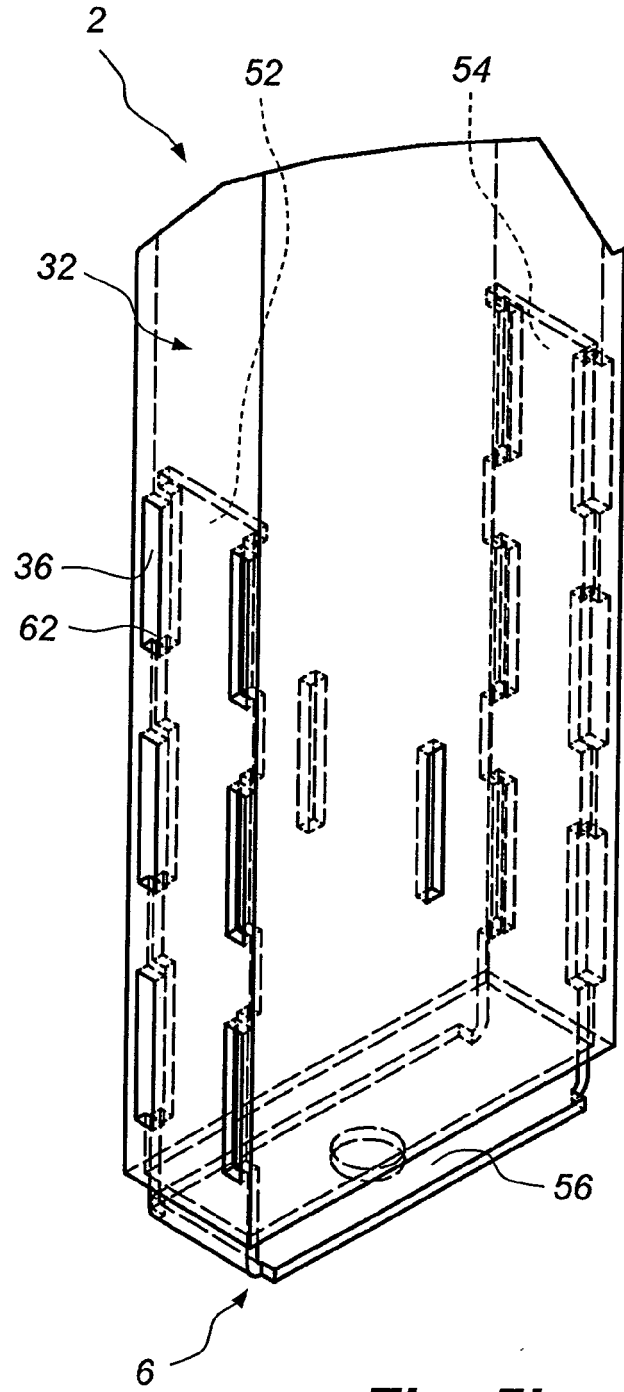
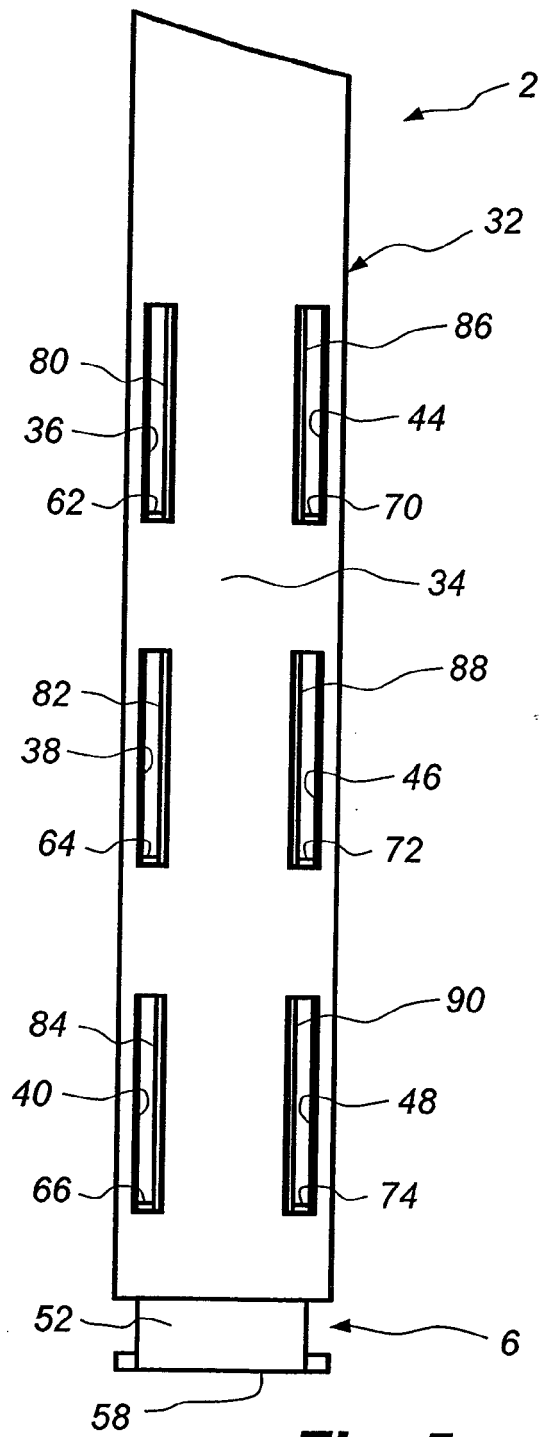


Fig. 4b



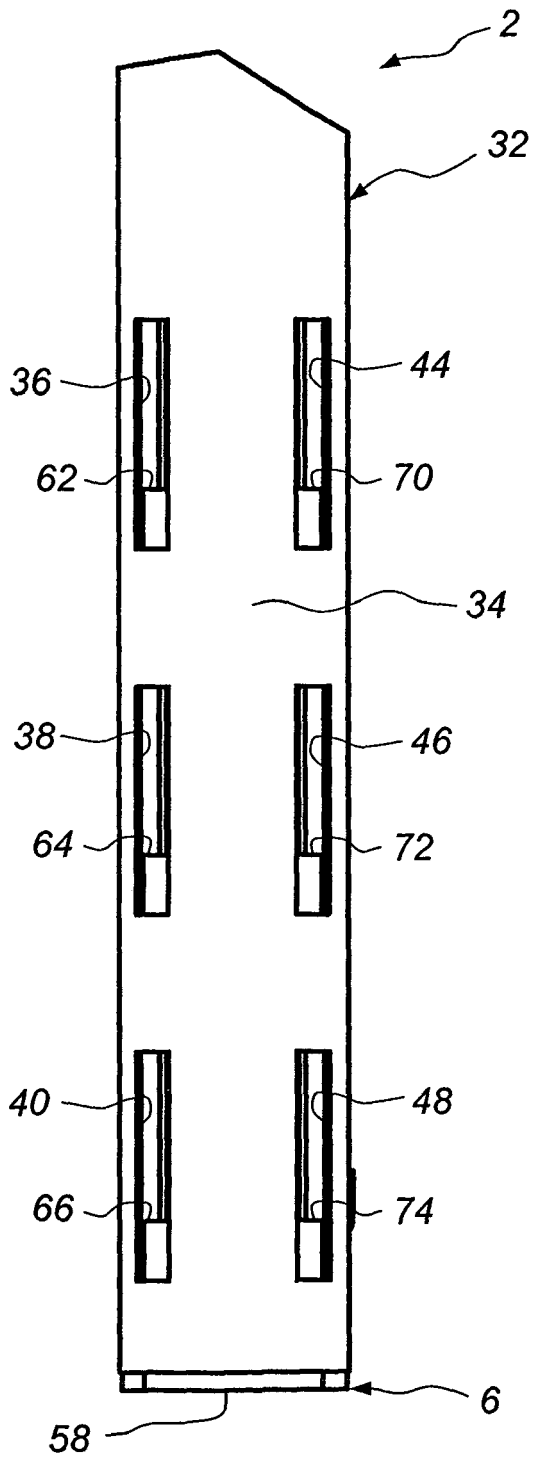


Fig. 6a

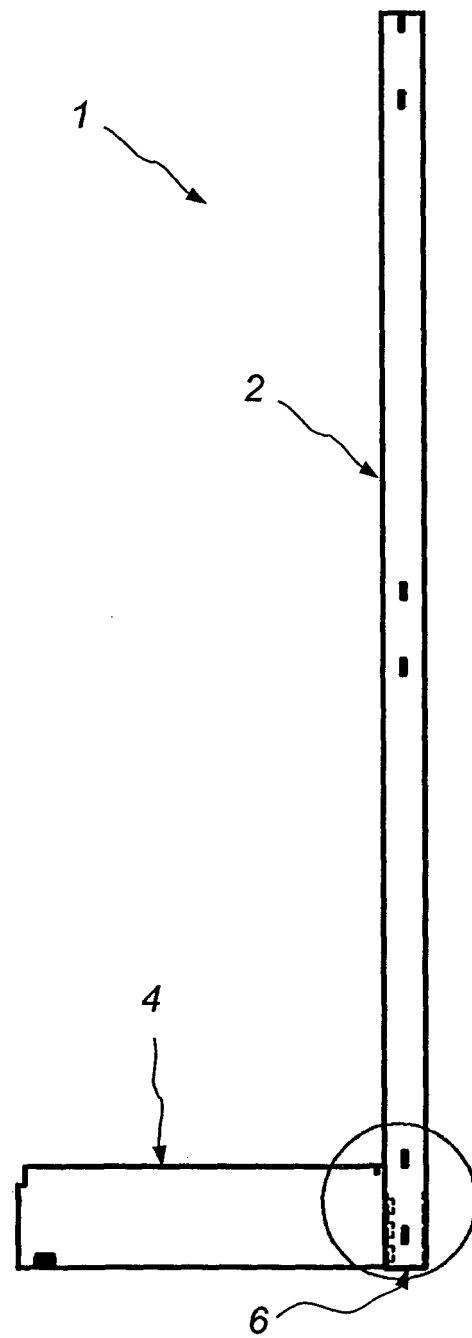


Fig. 6b

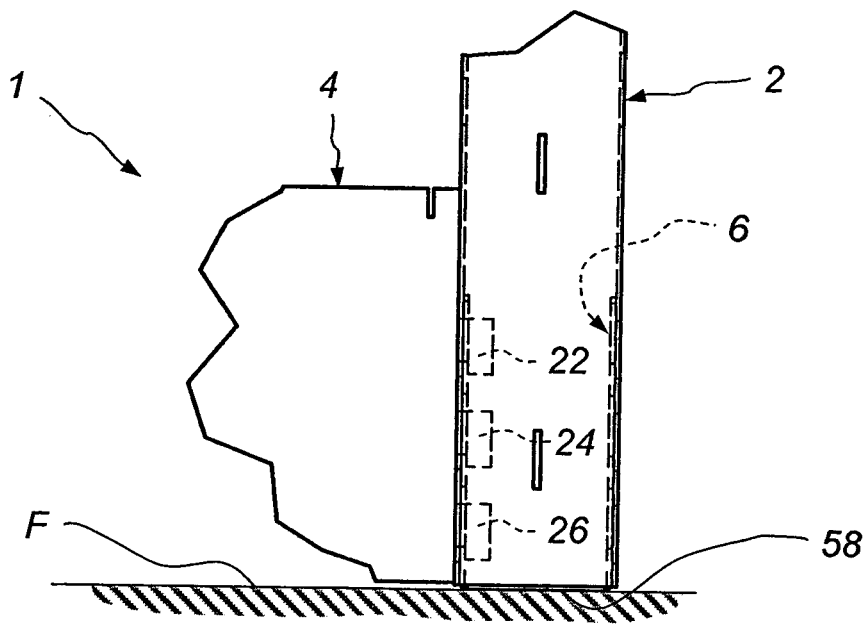


Fig. 6c

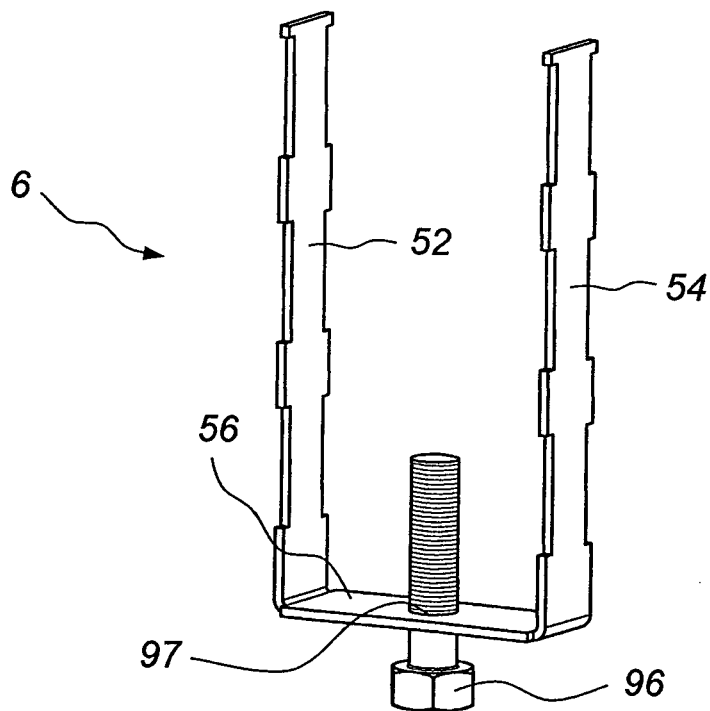


Fig. 8

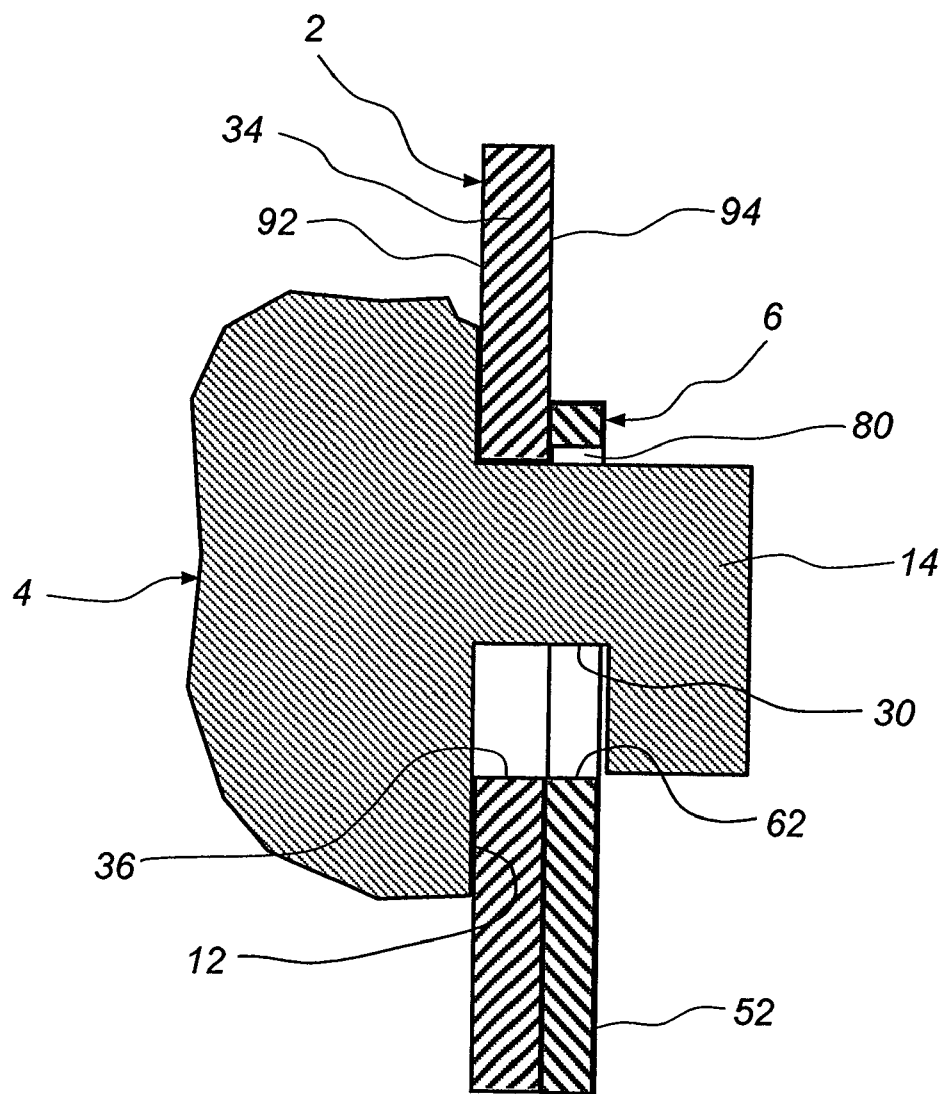


Fig. 7a

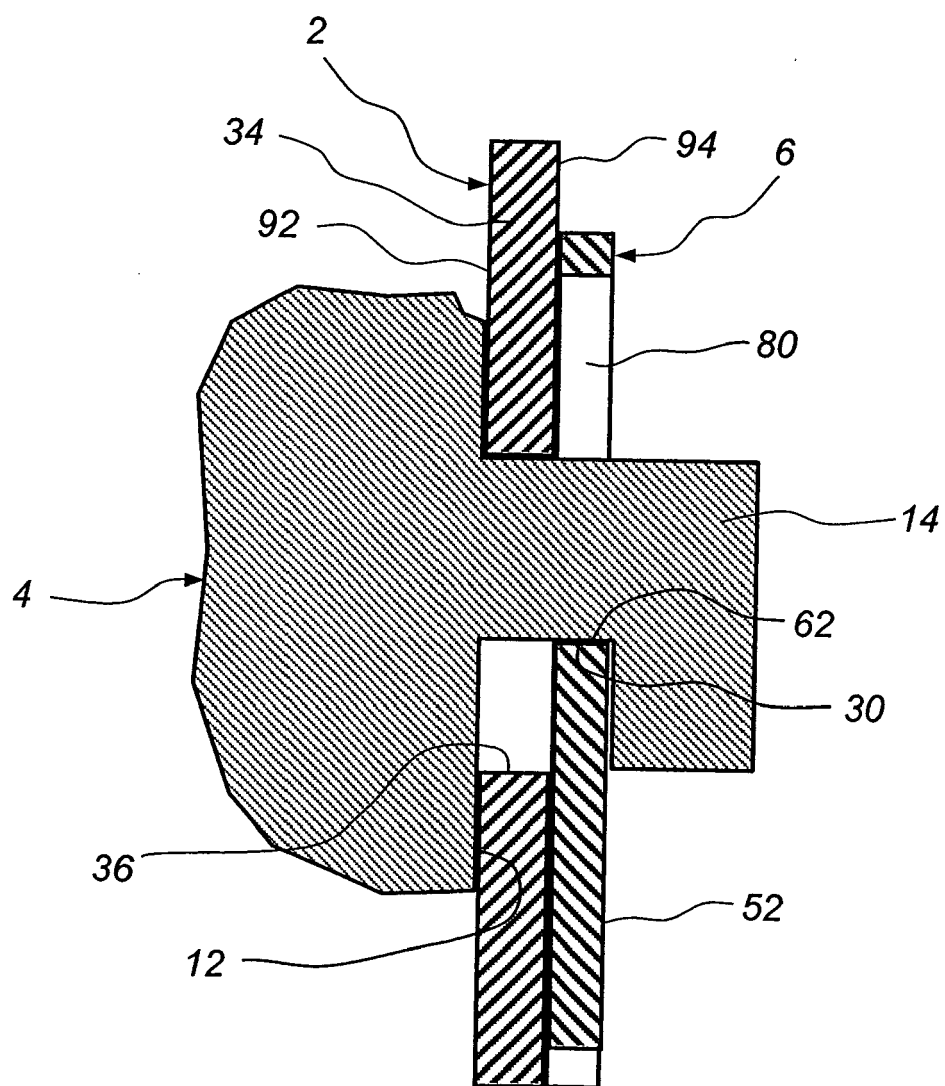


Fig. 7b

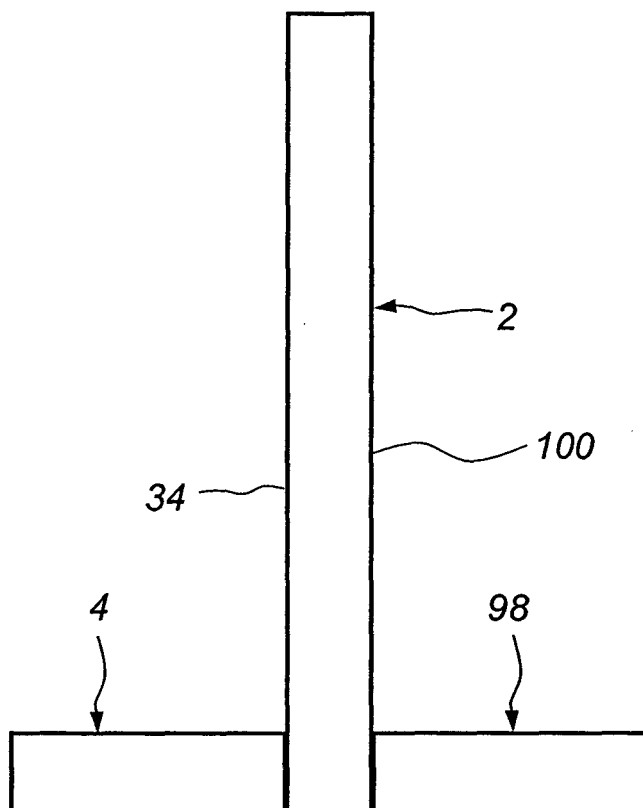


Fig. 9



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 05 01 3998

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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