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[Continued on nextpage]

(54) **Title:** FRAME FOR MOUNTING DISPLAY DEVICES ON THE WALL

Figure 2

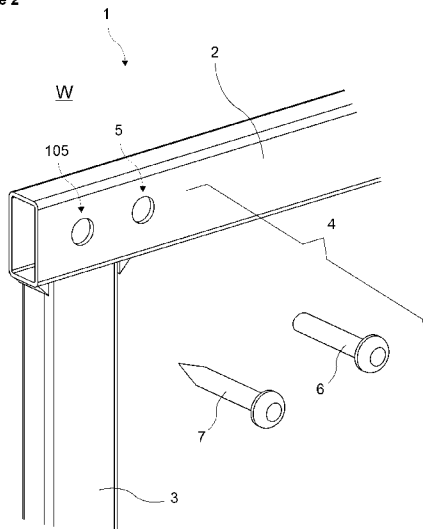
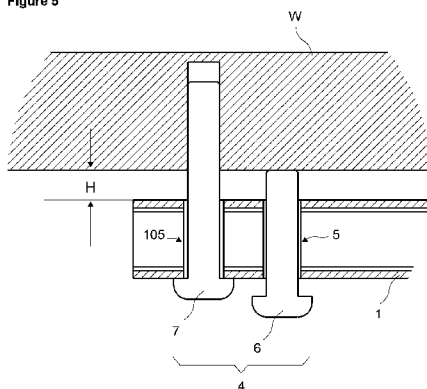


Figure 5



(57) **Abstract:** The present invention relates to a frame (1) providing mounting of the display devices like television, computer having touch screen (A) on the wall (W), comprising more than one beam (2) extending in the horizontal direction on the wall (W) surface and more than one column (3) extending in perpendicular direction to the beams (2) and whereto the beams (2) are connected.



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, 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.

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, ML, MR, NE, SN, TD, TG).

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## Description

## FRAME FOR MOUNTING DISPLAY DEVICES ON THE WALL

- [0001] The present invention relates to a frame that is used in mounting display devices like television, computer on the wall.
- [0002] Display devices like television, computer with touch-sensitive properties are mounted on the wall in some embodiments. A frame is used for mounting the display devices on the wall. The frame is mounted on the wall surface and the display device is fastened on the frame. The display device has an optical touch screen that the user touches with his/her finger or by using a special pen. The display devices having touch screens with optical features are widely used due to easy production - usage and their low costs. In this type of display devices, cameras and reflectors are disposed on the sides of the touch screen which detect the coordinates of the touched points. The flatness of the touch screen has to be adjusted precisely in order to detect the touched points accurately on the touch screen. The unevenness of the touch screen results in deflecting of the beams transmitted between the cameras and the reflectors and not being able to detect the touched points accurately. The wall not being smooth whereon the display device is mounted also results in the disruption of flatness of the touch screen. In the state of the art, in order to provide flatness, the touch screen is enforced with metal or plastic support members or the thickness of the glass panel situated on the front side of the touch screen is increased; however, these precautions increase the weight and cost of the display device.
- [0003] In the state of the art International Patent Application No. WO201 201 1686, a camera module and an optical touch screen are explained.
- [0004] In the state of the art Japanese Patent Application No. JP2006060754, a wall surface mounting unit for mounting thin shaped televisions on the wall surface is explained.
- [0005] The aim of the present invention is the realization of a frame used in mounting display devices having touch screens like television, computer on the wall and which provides the flatness of the optical touch screen to be adjusted.

- [0006] The frame realized in order to attain the aim of the present invention, and explicated in the first claim and the respective claims thereof, is used in mounting display devices having optical touch screens like television, computer on the wall. The frame has horizontal beams and vertical columns, and adjustment apparatuses are fastened on one or more than one point located on the frame. The adjustment apparatus moves the frame from the point whereto it is connected in the perpendicular direction to the wall, thus the unevenness and curvatures in the glass panel at the front side of the touch screen of the display device mounted on the frame, are eliminated.
- [0007] The adjustment apparatuses are preferably fastened to the beam - column connection points and/or at midpoints of the beams or columns.
- [0008] The adjustment apparatus is composed of two holes bored on the frame and a distance adjustment screw and a securing screw mounted to these holes.
- [0009] The distance adjustment screw bears against the wall when moved towards the wall, pulls the frame backwards and provides increase in the frame - wall distance.
- [0010] The securing screw penetrates the wall when moved towards the wall and pulls the frame towards the wall. The securing screw provides the distance adjusted by the distance adjustment screw to be maintained and the adjustment not to be changed.
- [0011] The hole wherein the distance adjustment screw is inserted is inner threaded. The hole wherein the securing screw is inserted is not threaded.
- [0012] In another embodiment of the present invention, the adjustment apparatus comprises a metal plate mounted on the wall surface, against which the end of the distance adjustment screw bears, thereby preventing the distance adjustment screw from wearing down the surface of the wall.
- [0013] The adjustment apparatus provides flatness of the touch screen by means of the frame without interfering with the display device. The adjustment apparatus is composed only of two holes bored on the frame and two screws mounted to these holes and flatness of the touch screen of the display device connected to the frame is maintained by a low cost and

simple structured solution.

[0014] The frame realized in order to attain the aim of the present invention is illustrated in the attached figures, where:

[0015] Figure 1 - is the perspective view of a display device and a frame that provides the display device to be mounted on the wall.

[0016] Figure 2 - is the perspective view of the adjustment apparatus in Detail D of Figure 1 in the position of not being mounted to the frame.

[0017] Figure 3 - is the perspective view of the adjustment apparatus in Detail D of Figure 1 in the position of being mounted to the frame.

[0018] Figure 4 - is the top view of a display device and a frame.

[0019] Figure 5 - is the view of detail D2 in Figure 4.

[0020] Figure 6 - is the view of detail D2 in Figure 4 in an embodiment of the present invention.

[0021] The elements illustrated in the figures are numbered as follows:

1. Frame
2. Beam
3. Column
4. Adjustment apparatus
5. 105. Hole
6. Distance adjustment screw
7. Securing screw
8. Metal plate

[0022] The frame (1) providing mounting on the wall (W) of the display devices like television, computer having a touch screen (A) comprises more than one beam (2) extending in the horizontal direction on the wall (W) surface and more than one column (3) extending in perpendicular direction to the beams (2) and whereto the beams (2) are connected.

[0023] The frame (1) of the present invention comprises one or more than one adjustment apparatus (4) disposed on the connection points (N) on the beam (2) or the column (3) or on the beam (2) - column (3) joints, providing the distance (H) between the frame (1) and the wall (W) surface to be at least partially changed by stretching the beams (2) and the columns (3) from their connection points (N), hence providing the flatness

of the touch screen (A).

- [0024] The adjustment apparatus (4) moves the frame (1) forwards-backwards from the connection points (N) in perpendicular direction to the wall (W) surface by stretching the beams (2) and the columns (3). Consequently, the unevenness of the touch screen (A) of the display device mounted on the frame (1) resulting from the frame (1) or the wall (W) is eliminated and convex or concave curvatures are straightened.
- [0025] After the frame (1) is mounted on the wall (W), the display device is mounted thereon. The display device has touch sensitive features and comprises a touch screen (A) whereon the user touches with his/her finger or by using a special pen. Cameras or reflectors (not shown in the figures) that detect the touch of the user are disposed on the sides of the touch screen (A). The adjustment apparatus (4) of the present invention provides precise adjustment of the flatness of the glass panel (not shown in the figures) at the front side of the touch screen (A), and which is an integrated part of the touch screen (A). The cameras or reflectors on the touch screen (A) are provided to operate flawlessly.
- [0026] The frame (1) is moved from the connection points (N) whereto the adjustment apparatus (4) is mounted in perpendicular direction to the wall (W) surface, and moved away from the wall (W) or moved near the wall (W) by stretching the beams (2) and the columns (3). The adjustment apparatus (4) provides the flatness of the touch screen (A) by compensating the unevenness of the wall (W) surface and the curvatures in the beams (2) or columns (3) resulting from production. For example, six adjustment apparatuses (4), at four beam (2) - column (3) connection points (N) and the midpoints (N) of each beam (2) are fastened to the frame (1) formed of two right and left side columns (3) and two beams (2) one disposed at the top, the other at the bottom (Figure 1).
- [0027] In an embodiment of the present invention, the adjustment apparatus (4) comprises two holes (5, 105) bored on the point (N) whereto it is fastened to the frame (1), a distance adjustment screw (6) mounted to the first hole (5), providing increase/decrease in the distance (H) between the frame (1) and the wall (W) and a securing screw (7) mounted to the second hole

(105), providing the distance (H) adjusted by the distance adjustment screw (6) to be fixed and maintained.

- [0028] While mounting the frame (1) on the wall (W), the flatness of the touch screen (A) is provided by moving the distance adjustment screw (6) and the securing screw (7) forwards - backwards thereby increasing/decreasing the distance (H) of the frame (1) to the wall (W) from the connection points (N) whereto the adjustment apparatus (4) is mounted.
- [0029] In an embodiment of the present invention, the first hole (5) is inner threaded. In this embodiment, when the distance adjustment screw (6) is moved through the first hole (5) towards the wall (W), its end bears against the wall (W) surface, does not penetrate the wall (W) surface and increases the distance (H) between the frame (1) and the wall (W) by pushing the frame (1) backwards, from the connection point (N) whereto the adjustment apparatus (4) is mounted.
- [0030] In another embodiment of the present invention, the second hole (105) is not inner threaded. The securing screw (7) penetrates the wall (W) when moved through the second hole (105) towards the wall (W) and is tightened (rotated) until the head portion bears against the frame (1), thus the distance (H) adjusted by the distance adjustment screw (6) is provided to be maintained. The securing screw (7) also provides the frame (1) to be mounted on the wall (W) and it is not required to use other elements for securing the frame (1) on the wall (W). When the frame (1) is required to be moved near the wall (W) in order to provide flatness of the touch screen (A), the securing screw (7) is moved forward inside the wall (W), pushing the frame (1) towards the wall (W), thus providing decrease in the distance (H) between the frame (1) and the wall (W).
- [0031] In order to adjust the distance (H) between the frame (1) and the wall (W), first the distance adjustment screw (6) in the first hole (5) is rotated and the frame (1) is either moved closer towards the wall (W) from the connection points (N) or moved away from the wall (W). When the required flatness is satisfactorily maintained in the touch screen (A), the securing screw (7) in the second hole (105) is moved inside the wall (W)

until the head portion bears against the frame (1) and the distance (H) adjusted by the distance adjustment screw (6) is kept fixed by means of the securing screw (7).

- [0032] In another embodiment of the present invention, the adjustment apparatus (4) comprises one or more than one metal plate (8) mounted on the wall (W) surface, against which the end of the distance adjustment screw (6) bears (Figure 6). The metal plate (8) prevents the end of the distance adjustment screw (6) bearing against the wall (W) (not penetrating the wall (W)) from wearing down the wall (W).
- [0033] The flatness of the touch screen (A) is controlled by two strings or metal wires fastened diagonally between its corners. During performing flatness adjustment in the frame (1) by means of the adjustment apparatuses (4), the diagonally fastened strings or wires on the surface of the transparent panel of the touch screen (A) coinciding at the midpoint shows that flatness is achieved.
- [0034] The adjustment apparatus (4) composed of the holes (5, 105) bored on the frame (1), the distance adjustment screw (6) and the securing screw (7) presents a simple structured and low cost solution for providing flatness of the touch screen (A). The securing screws (7) located in the adjustment apparatuses (4) also provide the frame (1) to be secured on the wall (W). Thus, it is not necessary to use additional mounting elements for securing the frame (1) on the wall (W). Flatness adjustment is made in a precise manner by means of the adjustment apparatuses (4) and flatness is prevented from being distorted with the effect of exterior forces like impacting etc. The errors which result from the curvatures in the beams (2) and the columns (3) forming the frame (1) and/or unevenness of the wall (W) and which distort flatness of the touch screen (A) are compensated.
- [0035] It is to be understood that the present invention is not limited by the embodiments disclosed above and a person skilled in the art can easily introduce different embodiments. These should be considered within the scope of the protection disclosed by the claims of the present invention.



## Claims

1. A frame (1) providing mounting of the display devices like television, computer having touch screen (A) on the wall (W), comprising more than one beam (2) extending in the horizontal direction on the wall (W) surface, more than one column (3) extending in perpendicular direction to the beams (2) and whereto the beams (2) are connected, characterized in that one or more than one adjustment apparatus (4) disposed on the connection points (N) on the beam (2) or the column (3) or the beam (2) - column (3) joints, providing the distance (H) between the frame (1) and the wall (W) surface to be at least partially changed by stretching the beams (2) and the columns (3) from their connection points (N), hence maintaining the flatness of the touch screen (A).
2. A frame (1) as in Claim 1, characterized in that the adjustment apparatus (4) that comprises two holes (5, 105) bored on the connection point (N), a distance adjustment screw (6) mounted to the first hole (5), providing increase/decrease in the distance (H) between the frame (1) and the wall (W) and a securing screw (7) mounted to the second hole (105), providing the distance (H) adjusted by the distance adjustment screw (6) to be maintained.
3. A frame (1) as in Claim 1 or 2, characterized in that the adjustment apparatus (4) comprising the inner threaded first hole (5) and the distance adjustment screw (6), the end of which bears against the wall (W) surface when moved from the first hole (5) towards the wall (W).
4. A frame (1) as in any one of the above Claims, characterized in that the adjustment apparatus (4) comprising the second hole (105) which is not inner threaded and the securing screw (7) that penetrates the wall (W) when moved from the second hole (105) towards the wall (W).
5. A frame (1) as in any one of the above Claims, characterized in that the adjustment apparatus (4) comprising one or more than one metal plate (8) mounted on the wall (W) surface, against which the end of the distance adjustment screw (6) bears.

Figure 1

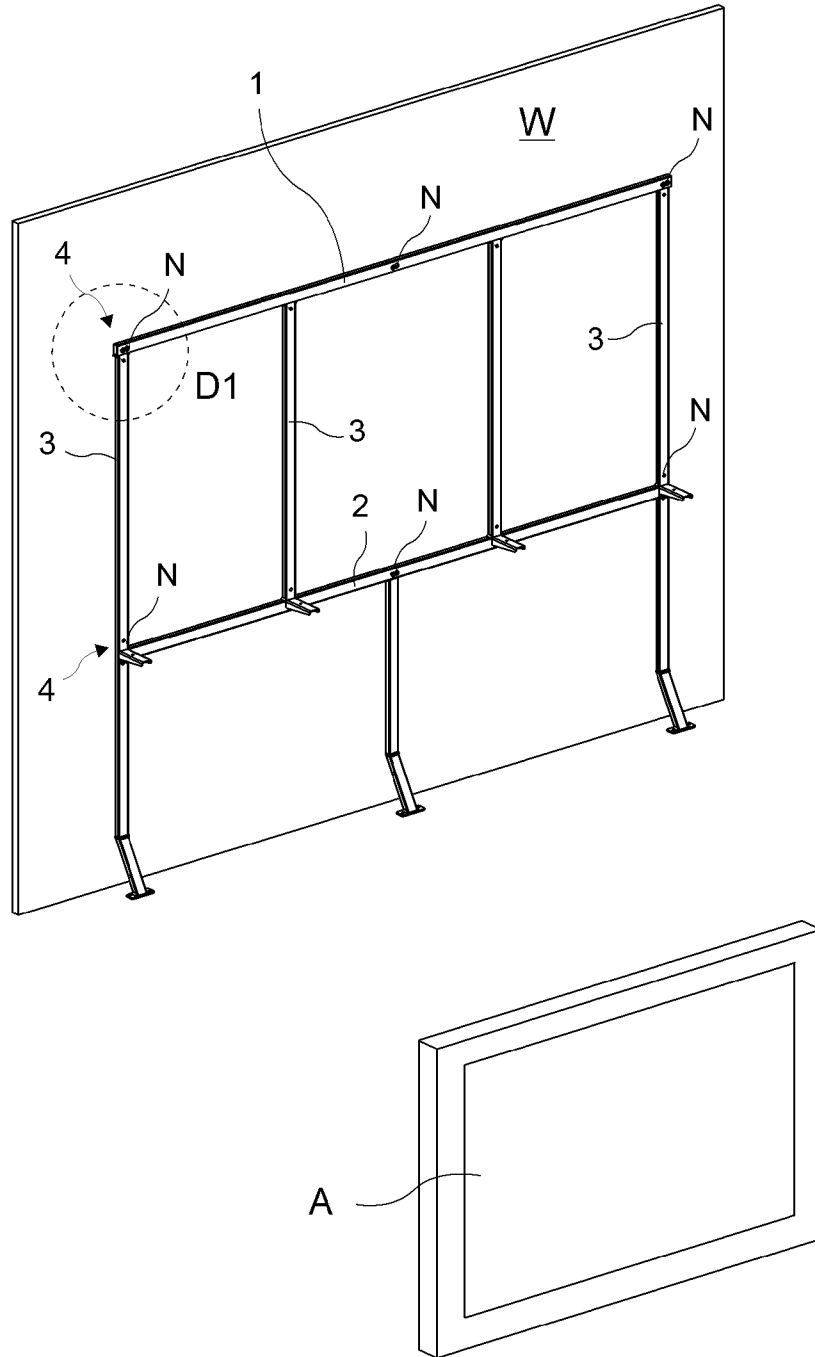


Figure 2

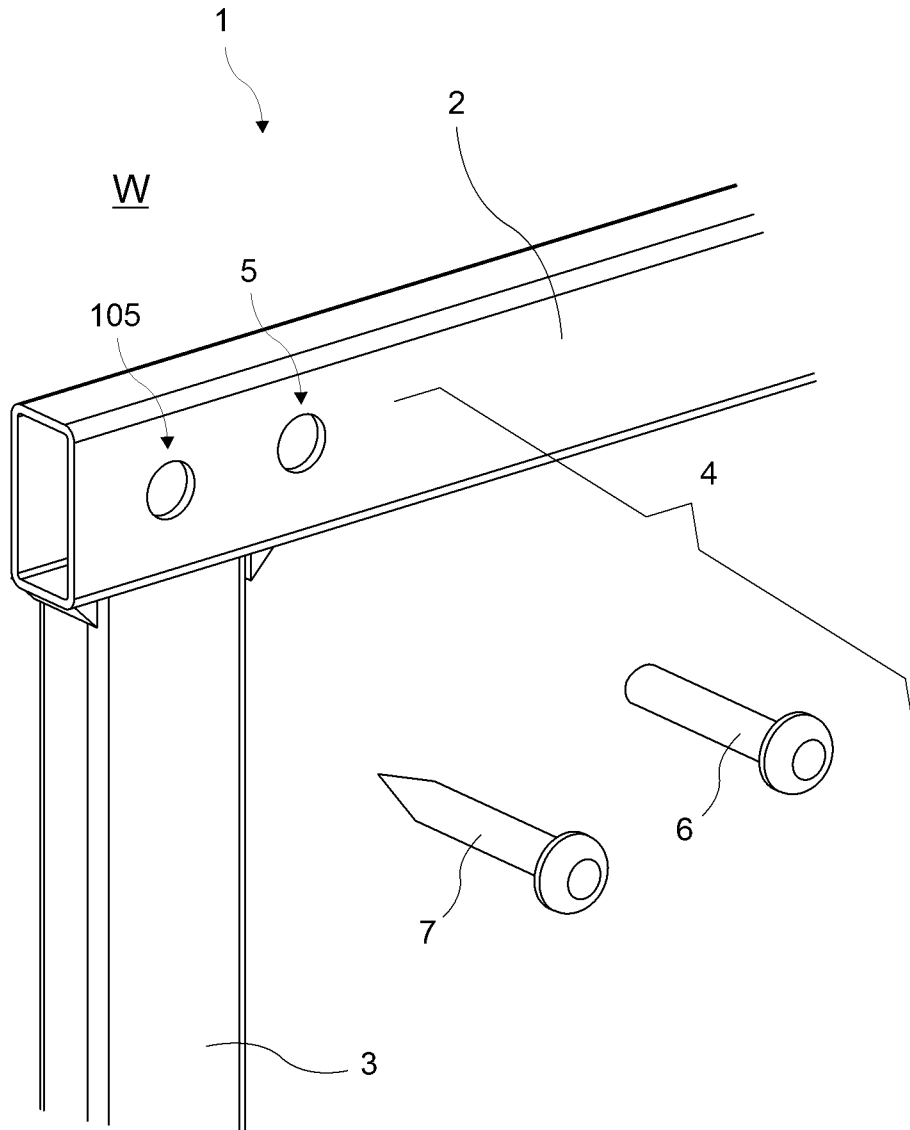


Figure 3

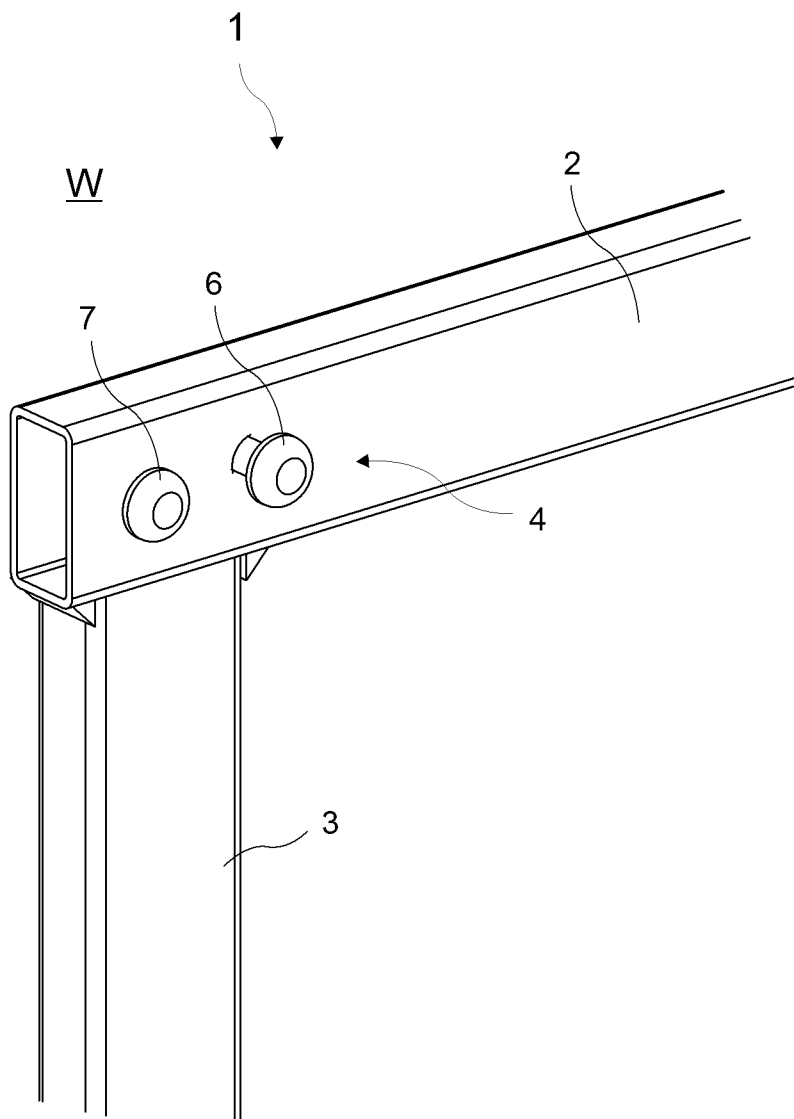


Figure 4

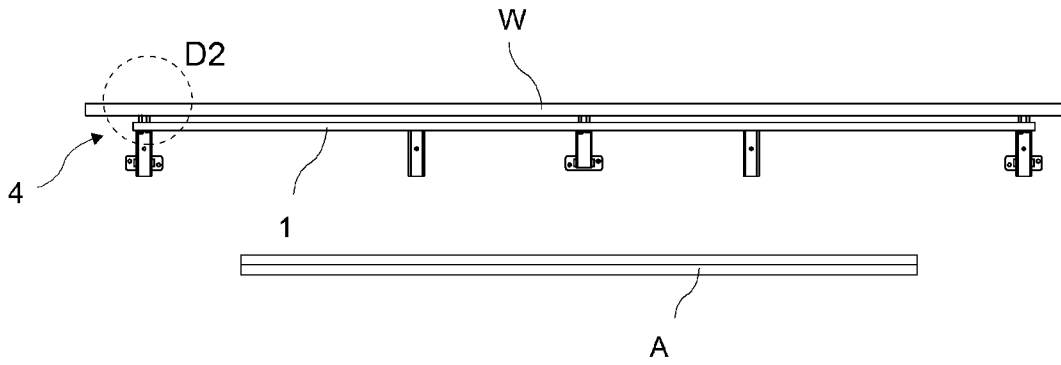


Figure 5

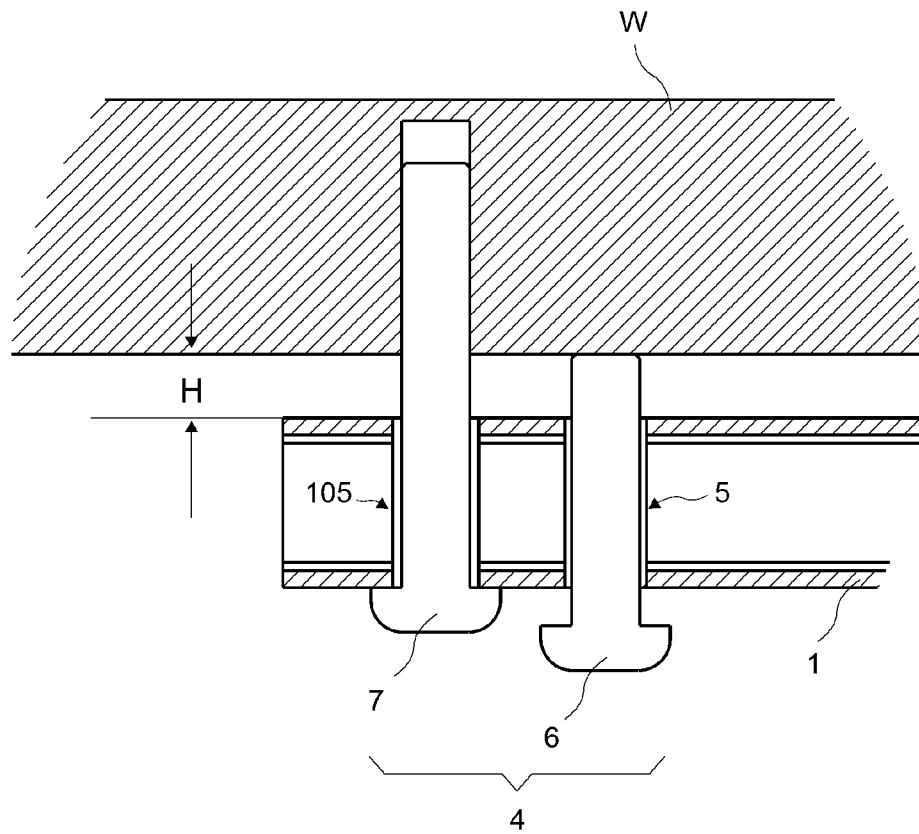
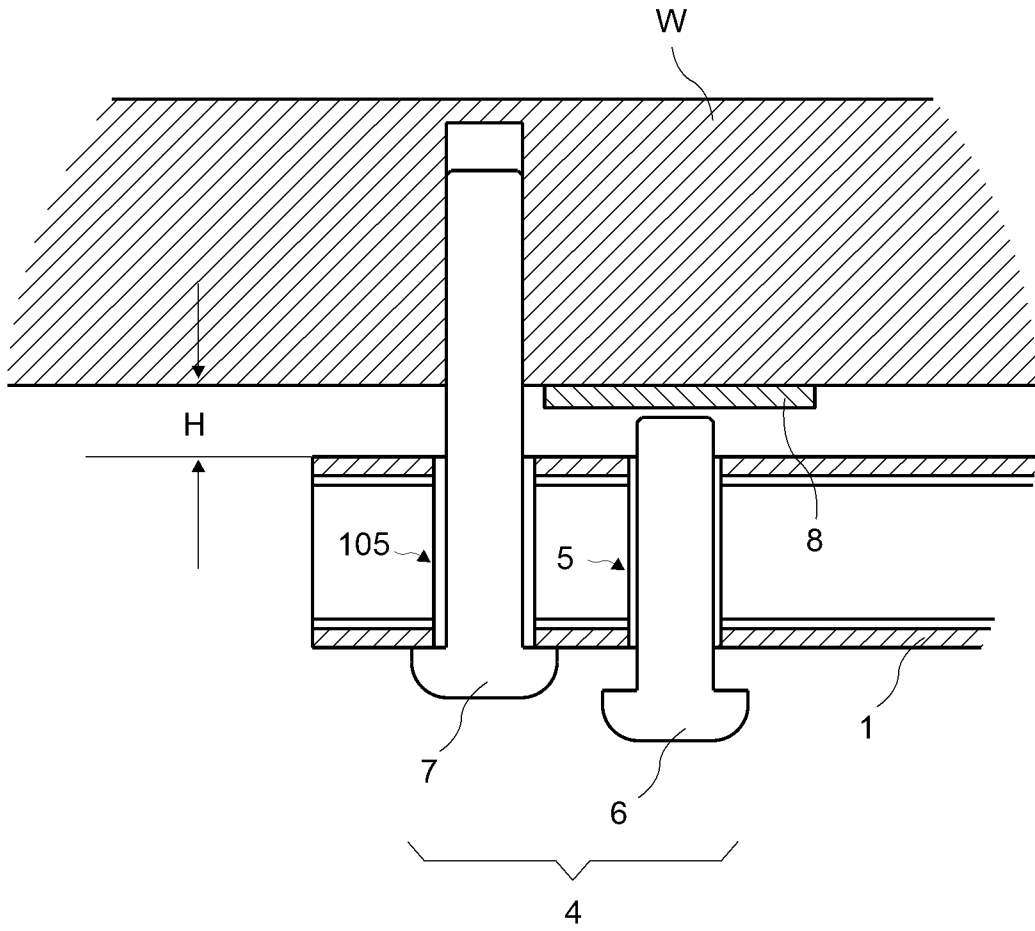


Figure 6



# INTERNATIONAL SEARCH REPORT

International application No PCT/EP2013/058084
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A. CLASSIFICATION OF SUBJECT MATTER  
 INV. F16B5/02 F16M13/02  
 ADD.

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)  
 F16M H04N F16B A47B

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

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)  
 EPO-Internal , WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

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X,P	W0 2012/057734 AI (HEWLETT PACKARD DEVELOPMENT CO [US] ; SZOLYGA THOMAS H [US] ; DA0 DAVID) 3 May 2012 (2012-05-03) paragraph [0019] - paragraph [0037] ; figures 1-3 -----	1
A	US 4 731 915 A (HOLDER ROYCE Z [US] ) 22 March 1988 (1988-03-22) col umn 3, line 10 - col umn 4, line 44; figures 3,4 ----- -/- .	1

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

\* Special categories of cited documents :

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Date of the actual completion of the international search  10 July 2013	Date of mailing of the international search report  16/07/2013
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Name and mailing address of the ISA/ European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Authorized officer  Afanasi ev, Andrey
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## INTERNATIONAL SEARCH REPORT

International application No  
PCT/EP2013/058084

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	JP 2006 291982 A (NIPPEI TOYAMA CORP) 26 October 2006 (2006-10-26) paragraph [0016] - paragraph [0024] ; figures 1,2  -----	1
A	US 2011/019348 A1 (KLUDT KORY D [US] ET AL) 27 January 2011 (2011-01-27) paragraph [0089] - paragraph [0092] ; figures 20-23  -----	1



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Information on patent family members

International application No PCT/EP2013/058084
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