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- (54) **Title:** A SYSTEM FOR MOUNTING VIDEO/PHOTOGRAPHIC EQUIPMENT ON A SUPPORT HEAD

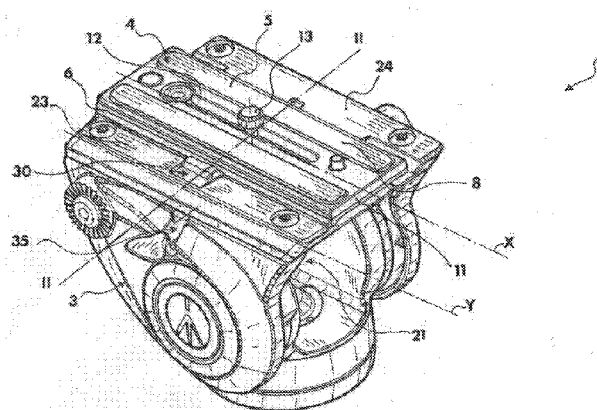


FIG. 1

- (57) **Abstract:** A system (1) for mounting video/photographic equipment (2) on a support head (3), the system comprising a mounting plate (4) which can be fixed to a lower part of the equipment and a seat (20) which is formed in a body (21) of the head and which can house the plate so that the plate can slide along a longitudinal axis (X). A hook (30) is provided on the head and is arranged to pivot between a first, seat-closing, position in which the plate is retained in the seat and a second, seat-opening, position in which the plate is free to enter or leave the seat along an insertion axis (Z) substantially perpendicular to the longitudinal direction (X). The head further comprises locking means for locking the plate inside the seat (20) in a desired position on the longitudinal axis, which comprise a pin (35) which is fixed to the hook and can be translated relative thereto, and which is adapted to bear on the body of the head in order to urge the hook into the first position against the plate. The pin (35) comprises an operating appendage (36) projecting from the hook and operable to pivot the hook from the first to the second position.



**A SYSTEM FOR MOUNTING VIDEO/PHOTOGRAPHIC EQUIPMENT ON
A SUPPORT HEAD**

DESCRIPTION

Technical field

5 The present invention relates to a system for mounting video/photographic equipment on a support head, having the features stated in the preamble of the main claim.

Prior art

10 In the technical field of the invention, there are known and widely used systems for mounting an item of video/photographic equipment on a support head.

A known mounting system typically comprises a plate, which is fixed to the lower part of the equipment, and a seat formed on the support head, which can house the plate so that the plate can slide along a longitudinal axis of the plate. This feature enables the position of the equipment to be suitably adjusted with respect to the mounting head so as to balance the equipment correctly on the head. The known mounting system also has locking means provided on the support head, which can lock the equipment in the desired position in the seat.

20 The seat formed on the support head typically has a dovetail profile with a bearing surface enclosed between a pair of lateral guides with inclined walls, and the support plate is inserted into the seat tangentially, with a movement parallel to the bearing surface of the seat.

25 However, this operation may prove to be difficult because the insertion requires a rather precise condition of alignment between the plate and the

seat, and the plate is generally concealed from view because it is located on the lower part of the equipment.

Disclosure of the invention

The problem underlying the present invention is that of providing a system
5 for mounting video/photographic equipment on a support head which overcomes the limitations described above with reference to the cited prior art.

Within the scope of this problem, one object of the invention is to develop a mounting system which is reliable and can be easily manufactured and
10 produced at limited cost.

This problem is resolved and this object is achieved by the present invention by means of a mounting system made in accordance with the appended claims.

Brief description of the drawings

15 The characteristics and advantages of the present invention will be made clearer by the following detailed description of a preferred example of embodiment thereof, illustrated in a non-limiting way for information only, with reference to the attached drawings, in which:

- Figure 1 is a perspective view from above of a system for mounting
20 an item of video/photographic equipment on a support head, made according to the present invention;
- Figure 2 is a cross-sectional view taken along the line II-II of the mounting system of Figure 1;
- Figure 3 is a lateral perspective view of the mounting system of
25 Figure 1 with some components removed;

- Figures 4 to 6 are rear views of the mounting system of Figure 1 in respective operating positions.

Preferred embodiment of the invention

With reference to the attached drawings, the number 1 indicates the whole
5 of a system for mounting an item of video/photographic equipment 2, illustrated in a purely schematic way in broken lines in Figures 4 to 6, on a support head 3, made according to the present invention.

The mounting system 1 comprises a mounting plate 4, which can be fixed
removably to a lower part of the equipment 2, and which comprises a
10 central body 5 of generally rectangular and substantially flat configuration, extending predominantly along a longitudinal axis X. The central body 5 is delimited longitudinally by a first and a second side, identified by 6 and 7 respectively, projecting on opposite sides of a surface 8, formed on the central body 5, on which the equipment 2 rests.

15 The first side 6 has a shelf-like profile with a flange 9 extending substantially parallel to the surface 8, in a lower position and in a direction away from the central body 5. The free edge of the flange 9, remote from the central body 5, is slightly thicker than the remaining portion of the flange 9.

20 The second side 7 has a profile in the form of an inclined plane diverging from the surface 8.

The central body 5 of the plate 4 is also delimited longitudinally by opposing edges 11, which are also bent back on the side opposite the surface 8.

In a median region of the central body 5 of the mounting plate 4 there is
25 also formed a longitudinal slot 12 in which a connecting pin 13 is slidably

engaged, this pin being engageable with a corresponding seat provided in the lower part of the equipment 2, according to features known in the art.

The system 1 further comprises a seat 20 formed at the top of a body 21 of the support head 3, which can house and engage the plate 4 so that the plate can slide along the longitudinal axis X.

For this purpose, the seat 20 comprises a base 22, forming a surface for supporting the plate 4, which base is enclosed between a first and a second lateral guide 23 and 24 which are substantially parallel to the longitudinal axis X, the base being open at its opposite longitudinal ends.

In order to prevent the plate 4 from moving out of the longitudinal ends of the seat 20, suitable travel limit elements are provided, comprising, for example, projections 25 rising from the base 22 and capable of bearing on the longitudinal edges 11 of the plate. It should be noted that the projections are thus concealed from view when the plate 4 is coupled to the head 3.

The second lateral guide 24 has a profile which is inclined with respect to the base 22, and which converges towards a median plane of the seat 20, so as to mate with the shape of the second side 7 of the plate 4.

The first lateral guide 23 has a profile substantially perpendicular to the base 22.

On the first lateral guide 23 there is provided a hook 30 which is pivoted on the body 21 and which can pivot about a pivot axis Y, substantially parallel to the longitudinal axis X, between a first, seat-closing, position, in which the plate 4 is retained in the seat 20, and a second position for opening the seat 20, in which the plate 4 is free to enter or leave the seat 20 along an

insertion axis Z substantially perpendicular to the longitudinal axis X and to the base 22.

The hook 30 is elastically urged into the aforesaid first position by a spring 31, and comprises, at its end associated with the first lateral guide 23, a tooth 32 which can bear on the flange 9 of the first side 6 of the plate 4.

In particular, when the hook 30 has been pivoted into the first position, the tooth 32 is located on the opposite side of the flange 9 from the base 22, acting in combination with the second lateral guide 24 to prevent the plate 4 from moving out of the seat 20 along the insertion axis Z.

A bearing surface 33 is advantageously formed on the tooth 32, such that, when the hook has pivoted into the first position, it is inclined towards the base 22 in such a way that the entry of the plate 4 into the seat 20 along the insertion axis Z initially causes the first side 6 of the plate 4 to contact the bearing surface 33 and then causes the hook 30 to pivot from the first position to the second position, allowing the entry of the plate 4 into the seat 20 to be completed.

Also provided on the head 3 are locking means designed to lock the plate 4 inside the seat 20 in a desired position on the longitudinal axis, these means comprising a pin 35 which is fixed to the hook 30 and can be translated relative thereto, and which can abut the body 21 in order to urge the hook 30, pivoted into the aforesaid first position, against the plate 4.

The pin 35 is fixed, by a penetrating screw fastening, to the hook 30 on the opposite side of the pivot axis Y from the tooth 32, and comprises an operating appendage 36, projecting outside the head 3, and a head 37 projecting on the opposite side from the hook 30, towards the body 21.

Thus, when the pin 35 is screwed into the hook 30, the head 37 is brought towards the body 21, thus progressively limiting the amplitude of the pivoting of the hook 30, starting from the first position, up to the point where pivoting is completely prevented. Additionally, when the pin 35 is
5 fully screwed in, the hook is pivoted further against the first side 6 of the plate 4, thereby locking it against the base 22 of the seat 20, while also preventing any movement of the plate along the longitudinal axis X.

The operation of the mounting system 1 is clearly shown in Figures 4 to 6. The equipment 2, to the lower part of which the plate 4 is fixed, is hooked
10 on to the head 3 from above, along the insertion axis Z, by first inserting the second side 7 of the plate 4 into the seat 20 and then exerting a pressure towards the base 22 (Fig. 4). This action initially causes the first side 6 of the plate 4 to contact the bearing surface 33 of the tooth 32, and consequently causes the hook 30 to pivot from the first to the second
15 position (Fig. 5). It should be noted that the hook 30 can also be pivoted easily from the first to the second position by direct action on the operating appendage 36.

In this configuration, the hook 30 is outside the seat 20, and does not interfere with the passage of the plate 4; consequently, the latter can enter
20 fully into the seat 20, bearing on the base 22. Because of the action of the spring 31, the hook 30 then returns to the first position so as to prevent the seat 20 from moving out of the plate 4 (Fig. 6).

In this configuration, the equipment 2 can easily be moved along the longitudinal axis X so as to be brought into the position which allows the
25 system to be correctly balanced.

At this point, the pin 35 is screwed in until the head 37 bears on the body 21 and the tooth 32 is pivoted further against the flange 9, thus locking the plate 4 in position.

The plate 4 is disengaged from the seat 20 by unscrewing the pin 35 by a
5 suitable amount and then acting on the operating appendage 36 to pivot the hook 30 from the first to the second position, so that the plate 4 can be conveniently extracted from the seat 20.

Thus the present invention resolves the problem outlined above, while also providing numerous other benefits, including the fact that a smaller number
10 of components is required for its production. The system can also be operated very rapidly and simply by the user.

A further advantage is that, since the locking pin is made to be fixed directly to the hook, a more compact support head can be produced, thus reducing the overall dimensions of the product, since the plate hooking and locking
15 mechanisms are substantially combined in a single mechanism.

Furthermore, also because of the feature mentioned above, the operations of hooking and unhooking the video/photographic equipment can be carried out with one hand only, while the other hand holds the equipment, thus facilitating these operations and improving the safety thereof.

CLAIMS

1. A system for mounting video/photographic equipment (2) on a support head (3), the system comprising a mounting plate (4) which can be fixed to a lower part of the equipment and a seat (20) which is formed
5 in a body (21) of the head and which can house the plate so that the plate can slide along a longitudinal axis (X), a hook (30) being provided on the head (3) and being arranged to pivot between a first, seat-closing position in which the plate is retained in the seat and a second seat-opening position in which the plate is free to enter or leave the seat
10 along an insertion axis (Z) substantially perpendicular to the longitudinal direction (X), as well as locking means for locking the plate inside the seat in a desired position on the longitudinal axis, characterized in that the locking means comprise a pin (35) which is fixed to the hook (30) and can be translated relative thereto, and which is adapted to abut the
15 body (21) in order to urge the hook into the first position against the plate (4), and in that the pin (35) comprises an operating appendage (36) projecting from the hook and operable to pivot the hook from the first to the second position.
2. A mounting system according to Claim 1, wherein the hook (30) is articulated on the body (21) for pivoting about a pivot axis (Y)
20 substantially parallel to the longitudinal axis and comprises a tooth (32) which can abut the plate when the plate is housed in the seat (20).
3. A mounting system according to Claim 2, wherein a bearing surface (33) is defined on the tooth, which, when the hook has pivoted to the
25 first position, is inclined towards a base (22) of the seat (20) so that the

entry of the plate into the seat along the insertion axis leads to pivoting of the hook from the first position towards the second position.

4. A mounting system according to any one of the preceding claims, wherein the hook (30) is urged resiliently into the first position.

5 5. A mounting system according to any one of the preceding claims, wherein the pin (35) is engaged in the hook by screwing.

6. A mounting system according to any one of Claims 2 to 5, wherein the pin is fixed to the hook on the side of the pivot axis (Y) opposite the tooth (32).

10 7. A mounting system according to any one of the preceding claims, wherein the seat (20) comprises a base (22) forming a surface for supporting the plate, which surface is enclosed between a first and a second lateral guide (23, 24) which are substantially parallel to the longitudinal axis (X), the hook (30) being articulated in the region of the
15 first lateral guide (23).

8. A mounting system according to any one of the preceding claims, wherein travel limit elements (25) are provided on the base (22) to limit the sliding of the plate (4) along the longitudinal axis inside the seat (20).

20 9. A support head (3) comprising a body (21) in which is formed a seat (20) for housing a mounting plate (4) for an item of video/photographic equipment (2) so that the plate can slide along a longitudinal axis, a hook (30) being provided on the head and being arranged to pivot between a first position in which the hook projects into the seat in order
25 to retain the plate in the seat and a second position in which the hook is

outside the seat so that the plate is free to enter or leave the seat along an insertion axis (Z) substantially perpendicular to the longitudinal axis, as well as locking means for locking the plate inside the seat in a desired position along the longitudinal axis, characterized in that the locking means comprise a pin (35) which is fixed to the hook and can be translated relative thereto, and which is adapted to bear on the body (21) in order to urge the hook (30) into the first position against the plate.

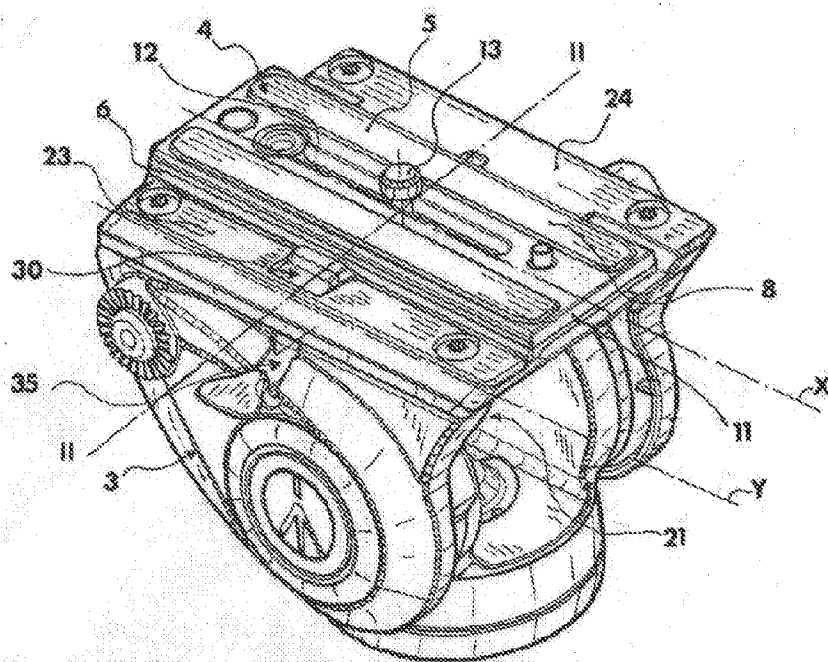


FIG. 1

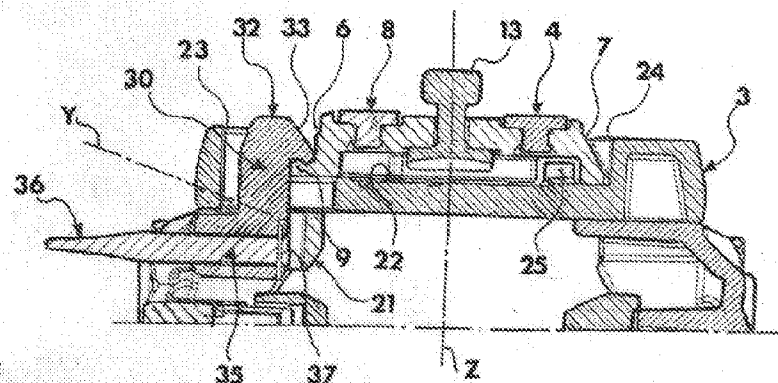


FIG. 2

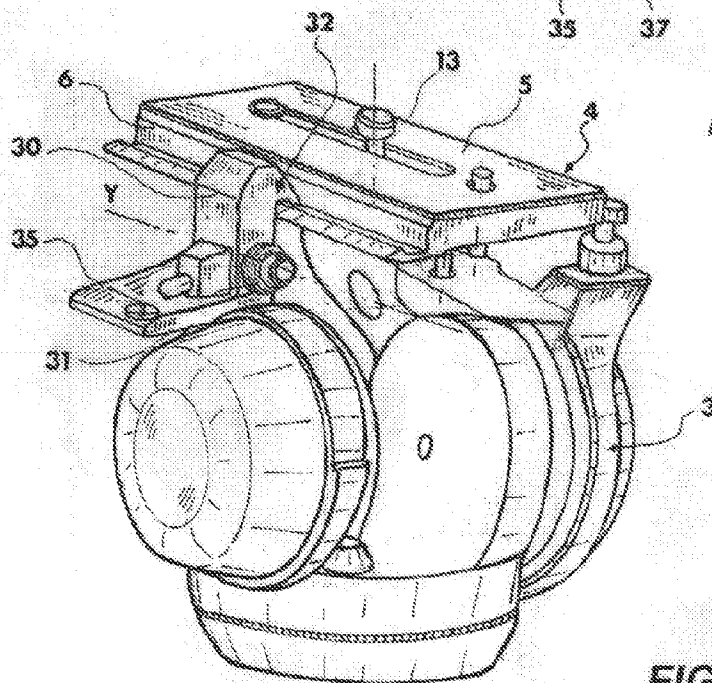


FIG. 3

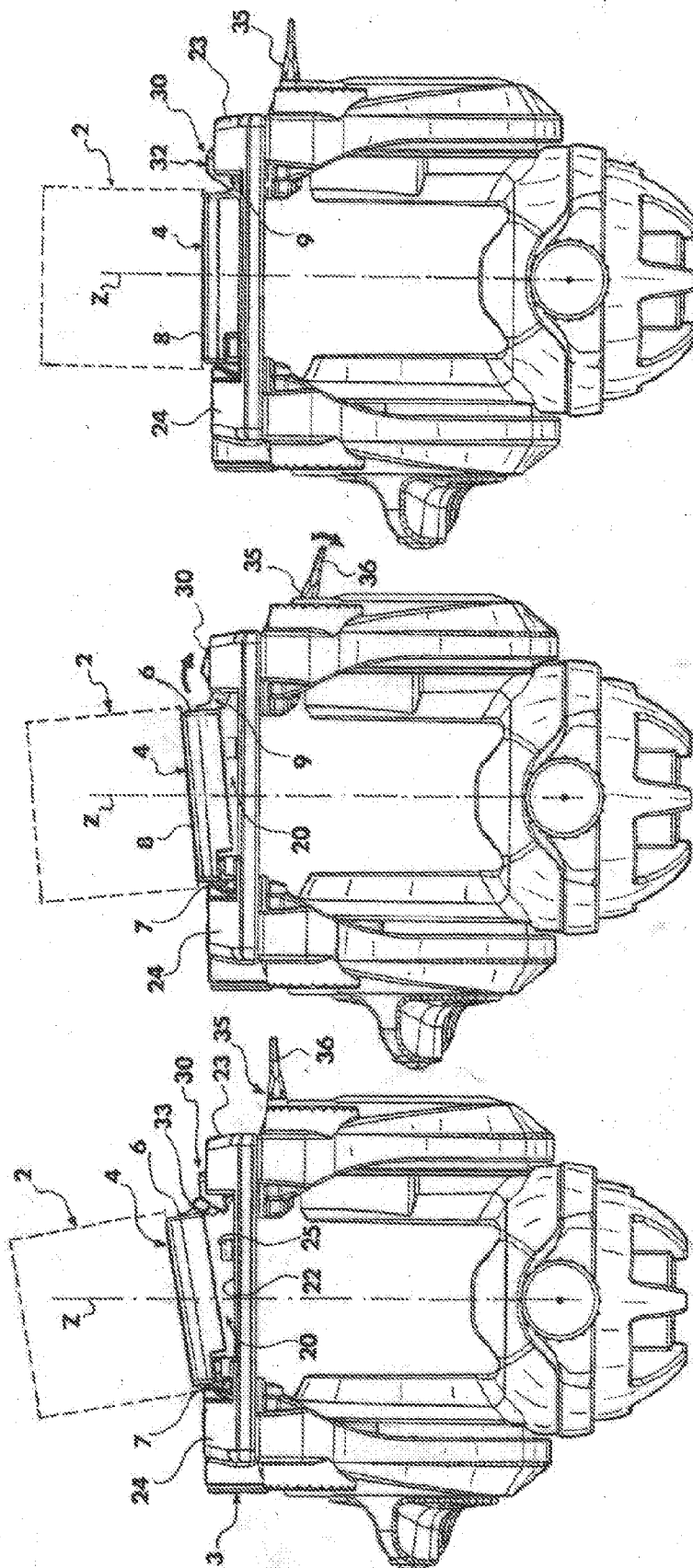


FIG.4

FIG.5

FIG.6

INTERNATIONAL SEARCH REPORT

International application No
PCT/IB2013/050936

A. CLASSIFICATION OF SUBJECT MATTER
INV. G03B17/56 F16M11/04
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)
G03B F16M

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	US 2003/218108 A1 (WERNER MAYR [AT] MAYR WERNER [AT]) 27 November 2003 (2003-11-27) the whole document	1-4,7-9
X	FR 2 552 579 A1 (PFLIEGER ROGER [FR]) 29 March 1985 (1985-03-29) the whole document	1,2,5-9
X	DE 27 47 677 A1 (SACHTLER FILMTECH GERAETE) 26 April 1979 (1979-04-26) page 13, line 19 - page 14, line 19; figure 5	1,2,5-9
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Further documents are listed in the continuation of Box C.



See patent family annex.

* Special categories of cited documents :

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"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

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Date of the actual completion of the international search

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INTERNATIONAL SEARCH REPORT

International application No

PCT/IB2013/050936

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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INTERNATIONAL SEARCH REPORT

Information on patent family members

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