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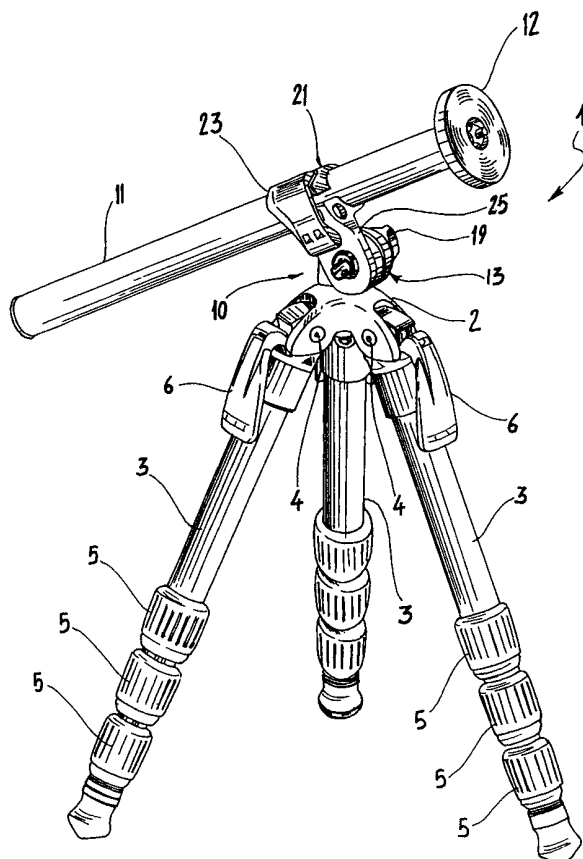
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(54) Title: IMPROVED TRIPOD, IN PARTICULAR FOR OPTICAL AND PHOTOGRAPHIC USE



(57) Abstract: An improved tripod is described, comprising a spider (2) having a main axis (X), at least three legs (3) converging in the spider (2) and articulated thereupon, and a support (10) in the spider (2) for supporting a column (11), in which are provided, in the support (10), means for placement of the column (11) for removably locking the latter in at least two positions in which the axis of the column is angularly inclined with respect to the main axis (X) of the spider.



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Improved tripod, in particular for optical and photographic use

Technical Field

The present invention relates to an improved tripod, in particular for optical or photographic use, according to the preamble of the main claim 1.

In the following context, the term "tripod" is meant to indicate supports with three or more legs and therefore no limitation is to be considered implicitly or explicitly attributable to the terminology employed with regard to the number of legs.

Background art

It is well known that tripods of the type indicated are used for supporting optical or photographic equipment in a stable manner at a predetermined distance and height with respect to the subject photographed.

A support of this type is known from the description of Patent Application No. PD98A000096 of the same Applicant. This describes a tripod comprising a spider for articulation of the legs and a support mounted in the spider with a first seating coaxial with the main axis of the tripod, and a second seating with axis substantially perpendicular to the first seating so that the column of the tripod can be received alternatively and removably in the first and the second seating.

In the case of photographic close-up shots or macrophotographs, in which it is necessary to get very close to the subject to be photographed, this tripod allows placements of the column, and consequently of the photographic equipment, very close up, in so far as the column can be mounted at right-angles with respect to the

main axis of the tripod, yet said placements are limited to only two directions, perpendicular to each other, obtainable by mounting the column in one or other of the seatings provided on the spider.

5 Disclosure of the Invention

The invention proposes as its principal aim that of improving the versatility of the tripods of known type by increasing the number of positions and placements allowed for the column.

10 Within the scope of said aim, the invention likewise proposes to allow the adjustment of the position of the column easily and independently of the adjustment of the position of the legs of the tripod.

These and other aims are achieved by the invention by
15 means of a tripod produced in accordance with the claims which follow.

Brief description of drawings

The characteristics and advantages of the invention will become clear from the following detailed description
20 of one of its preferred exemplary embodiments illustrated by way of non-limiting example with reference to the following drawings, in which:

Figure 1 is a perspective view of a tripod produced according to the present invention,

25 Figure 2 is a plan view of the tripod in Figure 1,

Figure 3 is a view in section along the line III-III in Figure 2,

Figure 4 is a view in partial section along the line IV-IV in Figure 3,

30 Figures 5 and 6 are perspective views of two details of Figure 4.

Best mode of carrying out the invention

With reference to Figures 1 to 3, the reference 1 indicates as a whole a tripod produced in accordance with the present invention and including a spider 2 having a main axis X in which there converge and are articulated three legs all indicated by 3, articulated on respective pins 4.

Each leg is produced with a telescopic structure having two or more extensions, the relative positioning of which is adjustable by means of clamps 5. The angular position of each leg 3 about the corresponding pin 4 is further adjustable by means of a lever adjusting device 6 of a type which is conventional per se.

Centrally in the spider there is provided a hole 7 extending coaxially with the axis X and capable of receiving a screw means 8 for locking a cylindrical pin 9 which is also coaxial with the axis X. On the pin 9 there is mounted rotatably about the axis X a support indicated as a whole by 10.

The support 10 comprises a first and a second part respectively rigidly connectable to the spider 2 and to a column 11, the latter being provided at one end with a connection 12, for example a screw connection, for attaching an item of photographic equipment or other equipment thereto.

More particularly, the first part comprises a clamping member 13 in which is defined a cylindrical seating 14 coaxial with the axis X and intended to receive the pin 9. The seating 14 is interrupted circumferentially by a notch 15 at which there extend, towards the outside, two juxtaposed cheeks 16a,b. By means of the notch 15 the

member 13 is elastically deformable and in particular is radially contractile transversely to the axis X.

The member 13 is clamped on the pin 9, so that it is rigidly connected to the latter by means of a screw clamping device indicated as a whole by 17. Said device
5 comprises a pin arrangement 18 of axis Y perpendicular to the main axis X, passing through the cheeks 16a,b, and having a head 18a and an opposed screw-threaded portion 18b screwed into an operating knob 19.

10 The reference 20 indicates a bearing, preferably of the rolling ball type, interposed between the knob 19 and the member 13, which serves to reduce the forces required by the user when actuating the knob 19.

The second part of the support 10 comprises a split
15 sleeve arrangement 21 which is slipped onto the column 11. The column 11 is rotatably and slidably received in the sleeve arrangement 21 and is clamped on the latter by means of a tie-rod 22, mounted on the sleeve and connected by one of its axial ends to a lever 23. Said lever 23 is provided
20 with a protuberance 24 interfering with the sleeve arrangement 21 to clamp the latter against the column 11 as a result of closing actuation of the lever on the sleeve itself.

From the sleeve arrangement 21 there extends an
25 appendage 25 defined by opposed surfaces 25a,b and traversed centrally by a hole 26 by means of which the sleeve arrangement 21 is supported rotatably on the pin 18.

Between the appendage 25 and the cheek 16a facing the latter there acts a coupling with frontal teeth including a
30 first and a second coupling member 27a,b that can be mutually coupled in the direction of the axis Y. The

coupling members 27a,b comprise respective toothed crowns 28a,b extending coaxially with the axis Y, projecting respectively from the surface 25a of the appendage 25 and from the surface of the clamping member 13 facing the
5 latter.

The toothed portions 28a,b are shaped with a profile such as to block the relative rotation between the first and the second part of the support, about the axis Y, when the coupling members 27a,b are mutually coupled.

10 The coupling members 27a,b are axially clamped against each other by the screwing of the knob 19 on the screw-threaded portion of the pin 18. The toothed crowns 28a,b are further capable of being axially coupled with a preselected angular positioning with respect to each other
15 about the axis Y, and consequently the sleeve arrangement 21, and therefore the column 11, can be oriented and locked with respect to the support 10, in a preselected operating position in which the column 11 is inclined with respect to the main axis X by a preselected angulation. The number of
20 relative angular positions between the column 11 and the spider 2 is determined by the number and the angular pitch of the teeth of the crowns 28a,b.

It should likewise be noted that by means of the clamping of the knob 19 on the pin 18 both the blocking of
25 the member 13 against rotation about the axis X and also the blocking of the sleeve arrangement 21 relative to rotation about the axis Y are obtained. Starting from a preselected placement of the column 11, in which rotation of the support 10 about the axes X and Y is blocked, a
30 first and partial unscrewing of the knob 19 makes it possible to uncouple axially the coupling members 27a,b

while maintaining the blocking of the support against rotation about the axis X. In said operating condition the column 11 can be freely oriented about the axis Y in order to be placed, if required, with a different inclination
5 with respect to the main axis X.

Further unscrewing of the knob 19, however, effects the unblocking of the support also with regard to rotation about the main axis X of the spider.

The invention thus achieves the aims proposed by
10 obtaining numerous advantages with respect to the known solutions. Firstly, with the tripod according to the present invention a greater versatility is obtained in the placement of the column with respect to the spider, with an increase in the number of positions, comprised and capable
15 of being selected between two opposed operating positions in which the column is respectively disposed parallel and perpendicular to the main axis of the spider. Secondly, the invention advantageously makes it possible to obtain easy and rapid adjustment of the positioning of the column in
20 addition to the fact that said adjustment is independent of the adjustment of the position of the legs of the tripod. This allows the user to act with greater rapidity and security in the placement of items of photographic equipment, which are often rather heavy, even in the case
25 of photographic shots which are not particularly convenient or easy.

C L A I M S

1. An improved tripod comprising a spider (2) having a main axis (X), at least three legs (3) converging in said spider (2) and articulated thereon, and a support (10) in
5 said spider (2) for supporting a column (11),
characterized in that it comprises in said support (10) means for placement of the column for removably locking said column (11) in at least two positions in which the axis of the column is angularly inclined with respect to
10 the main axis (X) of the spider.

2. A tripod according to claim 1, wherein the support (10) is mounted rotatably in said spider (2) about said main axis (X).

3. A tripod according to claim 1 or 2, wherein
15 between said support (10) and said spider (2) there are interposed means for blocking the rotation of the support (10) about said main axis (X).

4. A tripod according to one or more of the preceding claims, wherein said means for placement of the
20 column are incorporated in said means for blocking the rotation of said support (10).

5. A tripod according to one or more of the preceding claims, wherein said support (10) comprises a first (13) and a second part (21) respectively rigidly
25 connectable to the spider (2) and to the column (11), and said placement means comprise a coupling with frontal teeth (27a,b) which acts between said first and second part (13, 21).

6. A tripod according to claim 5, wherein the
30 coupling can be selectively uncoupled.

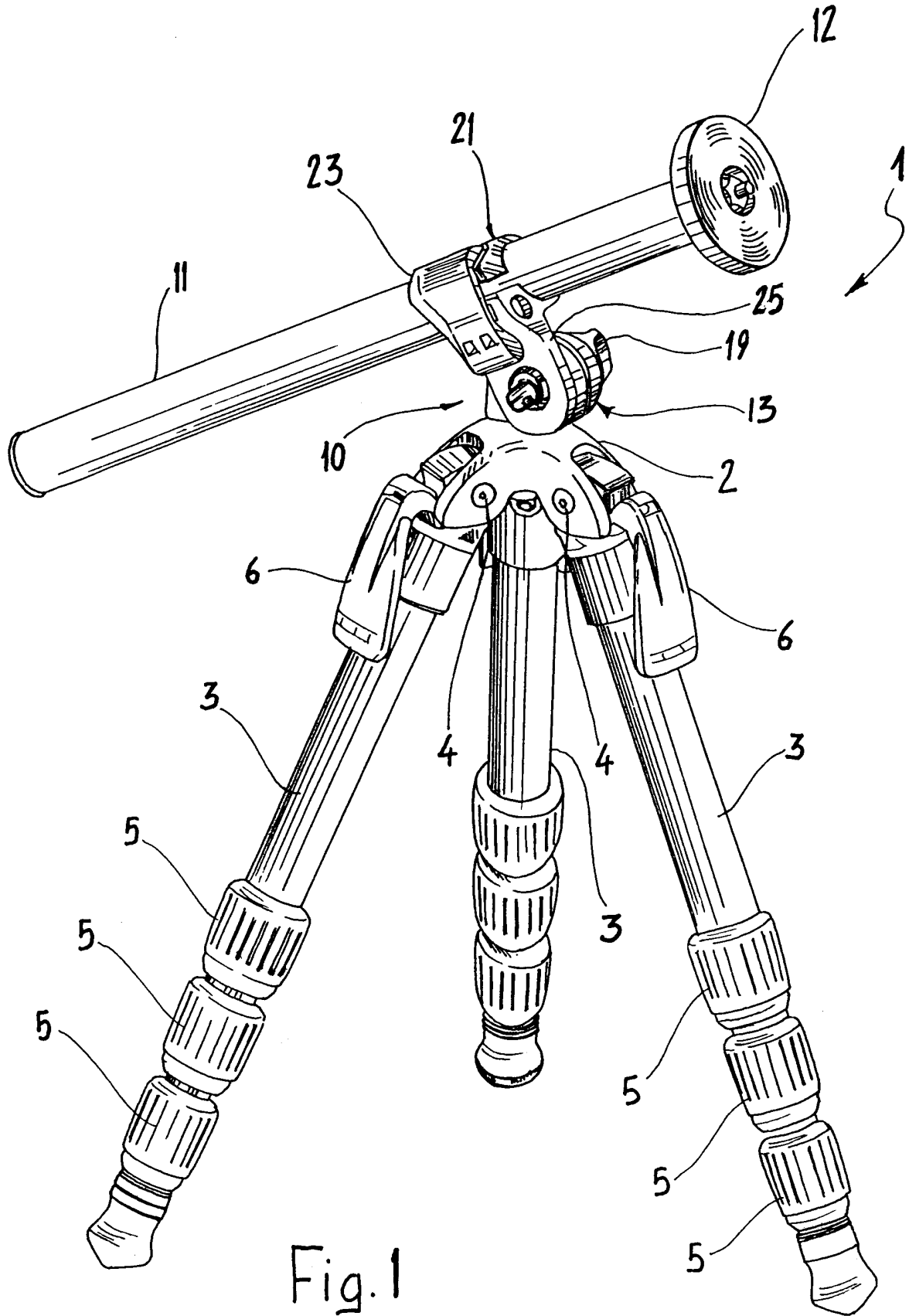
7. A tripod according to claim 5 or 6, wherein the

coupling members (27a,b) are coaxial with each other in a direction substantially perpendicular to the main axis (X) of the spider.

8. A tripod according to one or more of claims 5 to 5 7, wherein said coupling comprises a first and a second coupling member (27a,b) including, respectively, a first and a second toothed portion (28a,b) provided respectively on the first and on the second part of the support, said toothed portions (28a,b) constituting means for blocking 10 the relative rotation of said first and second part (13, 21).

9. A tripod according to one or more of claims 5 to 8, wherein said first part comprises a clamping member (13) lockable relative to the spider (2) about said main axis 15 (X), said first toothed portion (28a) being formed on a surface of said clamping element (13), and said second part comprises a sleeve arrangement (21) for the removable locking of the column (11), said second toothed portion (28b) being formed on an appendage (25) extending from said 20 sleeve arrangement (21).

10. A tripod according to claim 3, wherein said locking means comprise a screw clamping device (17) acting between said appendage (25) and said clamping member (13) in order to lock, in reciprocal coupling, said first and 25 second toothed portion (28a,b) in a preselected angular position of the column (11) with respect to the main axis (X) of the spider (2).



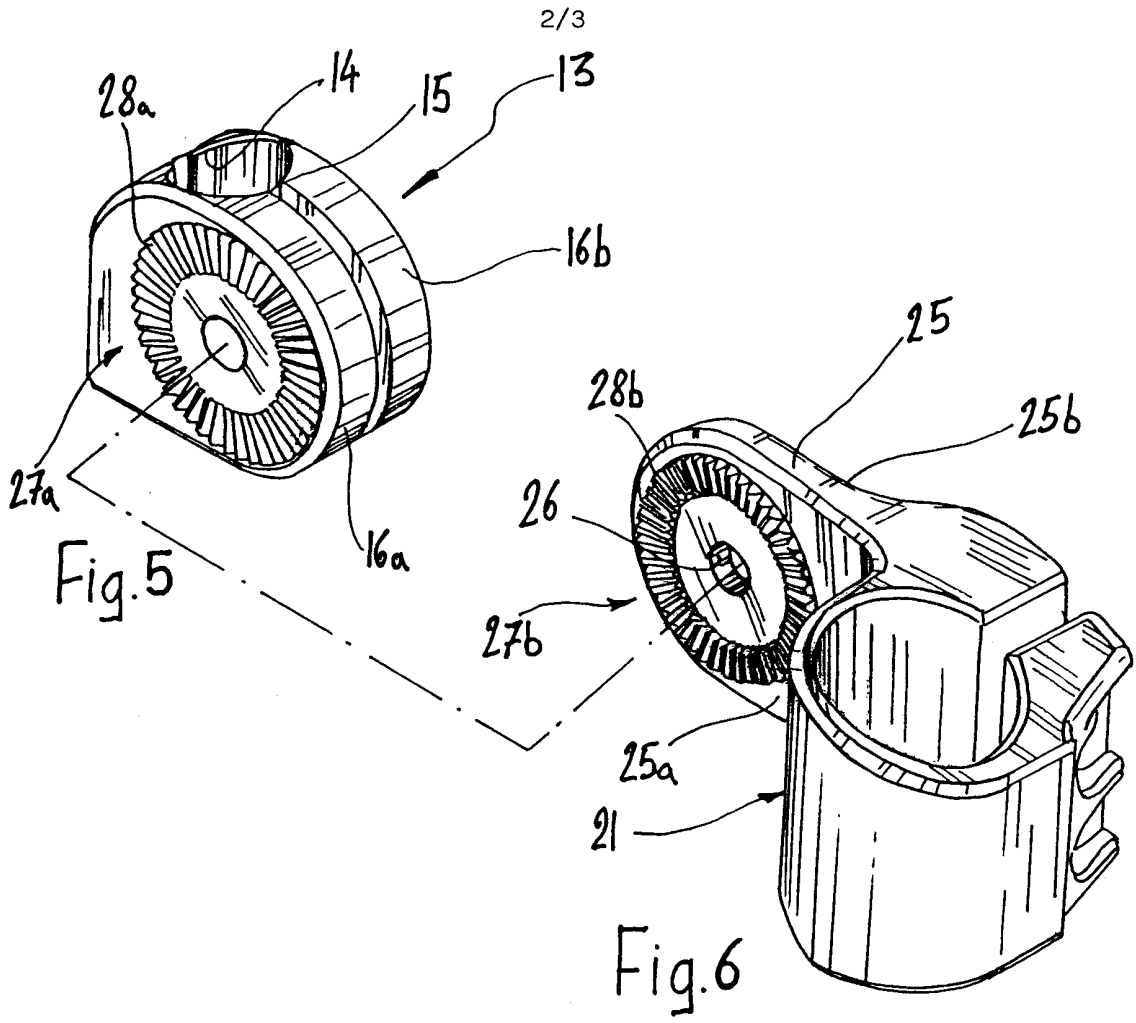


Fig.5

Fig.6

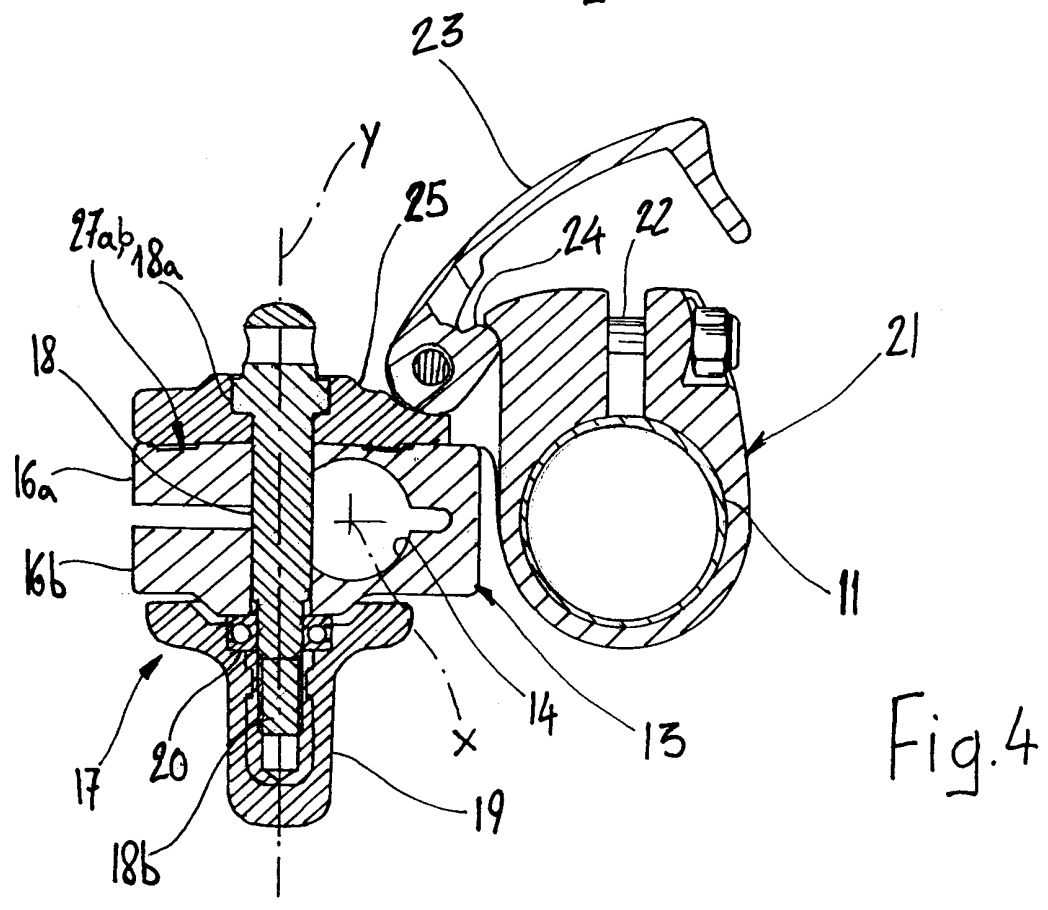


Fig.4

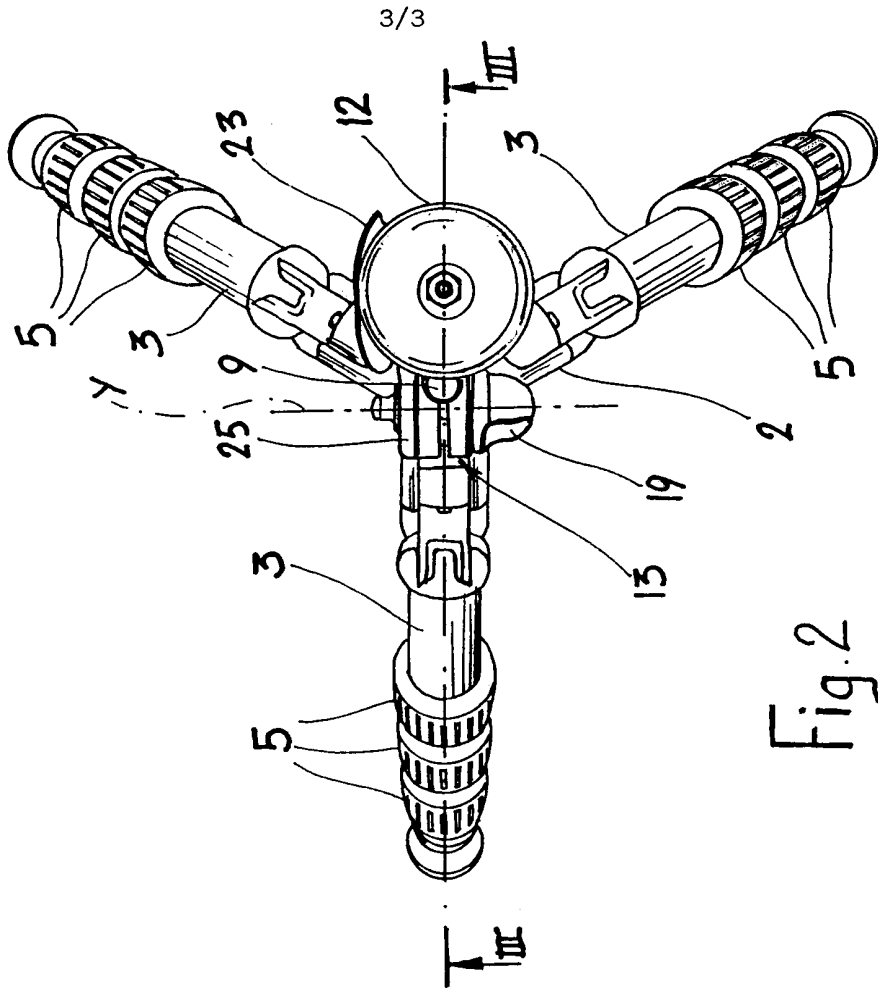


Fig. 2

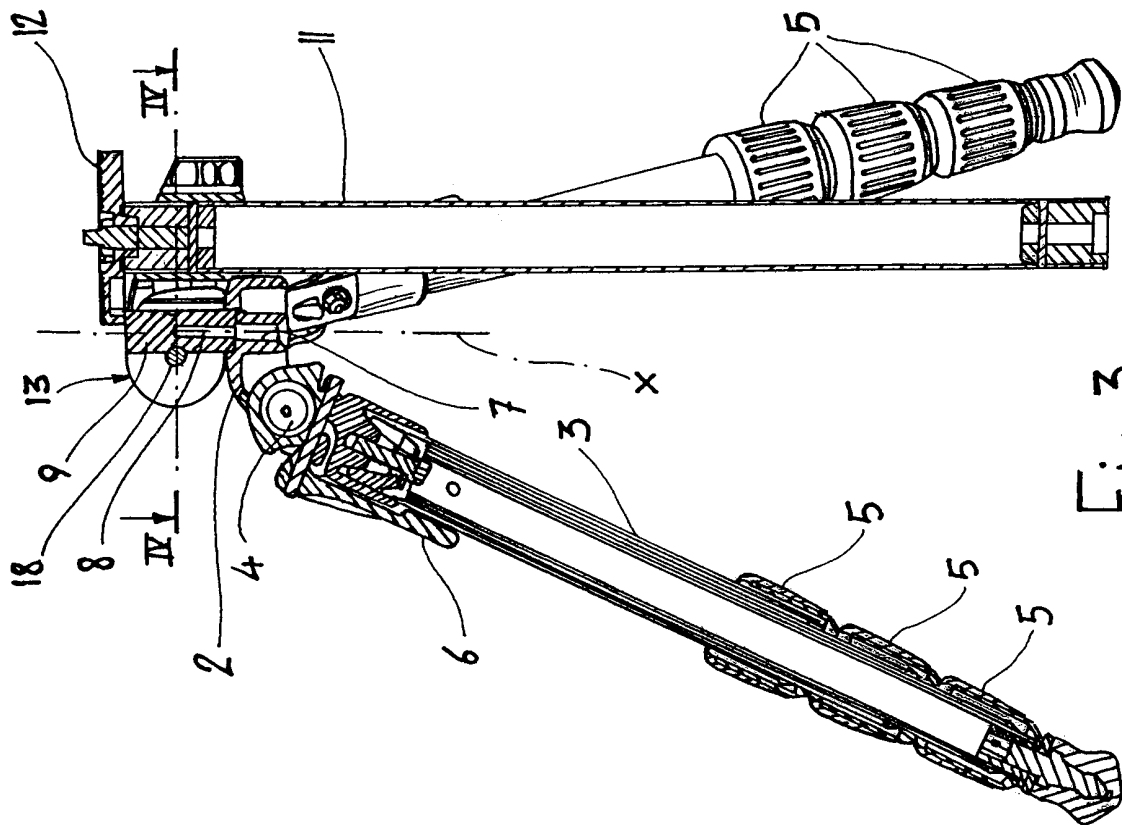


Fig. 3

INTERNATIONAL SEARCH REPORT

International Application No

PCT/EP 00/04129

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 F16M11/32 F16M11/02 F16M11/12

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)

IPC 7 F16M F16C

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 practical, search terms used)

PAJ, WPI Data, EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	FR 1 432 624 A (LAFFINEUR M) 8 June 1966 (1966-06-08) page 2, left-hand column, line 2 - line 13; figure 1	1-3
A	---	9
X	GB 905 332 A (NAKATANI K) 5 September 1962 (1962-09-05) page 1, line 43 -page 2, line 15; figures 1-5	1,2
A	---	9
A	EP 0 050 079 A (L'AIR LIQUIDE SA) 21 April 1982 (1982-04-21) page 3, line 19 -page 7, line 26; figures 1-5	5-9

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Further documents are listed in the continuation of box C.



Patent family members are listed in annex.

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Date of the actual completion of the international search

20 September 2000

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INTERNATIONAL SEARCH REPORT

International Application No

PCT/EP 00/04129

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 4 747 569 A (HOSHINO Y) 31 May 1988 (1988-05-31) the whole document ----	5,7-10
A	US 4 614 452 A (WANG C H) 30 September 1986 (1986-09-30) column 1, line 11 - line 20; figures 1-3 ----	10
A	EP 0 952 383 A (LINO MANFROTTO & CO SPA) 27 October 1999 (1999-10-27) cited in the application -----	

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

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