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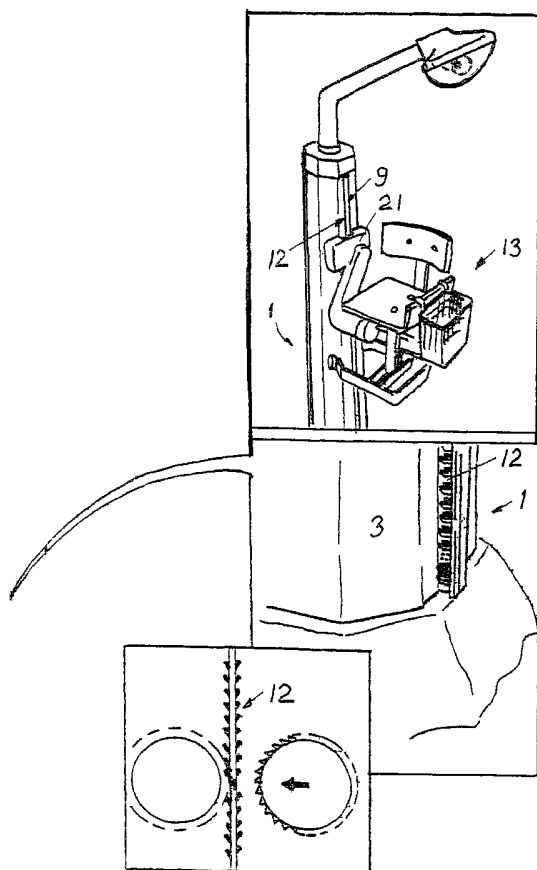
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[Continued on next page]

(54) Title: IMPROVEMENTS IN OR RELATING TO A POLE



(57) Abstract: The invention relates to a pole (1) consisting of at least two elongated segments (3) fixed to each other, which constitute mainly a round formed cross-section of the pole (1). Each segment (3) along its elongated edges (7, 8) comprises protruding flanges (4), by which said segments (3) are fixed to each other and said flanges (4) extend into a T-formation (9) in their free end portion at the same time as that portion of the flanges (4) constituting the web (20) in said T-formation (9), constitutes a rack (12) along which a movable chair (13) for montage and maintenance of the pole (1) and on the same existing equipment is supported.



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For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

Improvements in or relating to a pole

5 The present invention refers to an improvement in or relating to a mast or pole consisting of at least two elongated segments fixed to each other, said segments constitutes mainly a round formed cross-section of said pole.

10 In the market today several different types of masts or poles exist, the most of which usually consist of strong tubes having different diameter, said tubes having larger length can be conically formed or stepped-formed with different tube diameters, where the strong diameter is situated nearest the
15 ground. This type of poles has shown to be very expensive and furthermore a danger for vehicles which can lead to personal injures as a consequence during run into the same. In view of this fact one has in recent times also taken up structures which are of such a type that the pole is folded when run into the
20 same without serious injures as a consequence. This type of pole structures usually consists of a framework having thin types of tube pieces, profiles or rods fixed to each other.

The object of the present invention is to provide a new type of
25 mast or pole, which eliminates the drawbacks existing with the types today used and which pole, over and above that it is flexible during a collision, furthermore is very torsional rigid, easy and cheap to manufacture. The characterizing features of the present invention are stated in the claims
30 enclosed.

Thanks to the invention a mast or pole is now provided which in an excellent way fulfills its purposes at the same time as it is very simple and cheap to manufacture. The pole according to the

invention is built up of at least two profiled formed plate segments of preferably stainless steel and said plates can be very thin having a thickness which in certain cases can be less than 1 mm. The plates which in the simplest case can exist of two profile halves, which have been edged pressed or roll formed to a round, edge provided form, are fixed to each other by aid of elongated edges in the form of flanges, which are fixed to each other by aid of preferably point welding to a suitable shearing strength. By this erection a very light structure of a suitable length and dimension can be achieved. When more elongated pole structures are needed, which are intended to be used as lightning poles or for different types of mast for radio and/or other communication, the protruding flanges, which are intended to keep the pole segments together, are provided with a rack formation, along which a movable chair for montage and service of the pole and actual existing equipment can be placed. By this arrangement the service of the pole has been very much simplified compared with the case existing today when special step wagons or service vehicles must be used for changing lamps and service of radio masts and the like. According to the invention only the movable chair has to be placed by the serviceman on the pole and said chair very easy can be fixed to the flange part of the pole, which comprises said rack. After this operation the service-man can by aid of the movable chair move himself upwards or downwards along the pole to high positions needed in order to fulfill his work.

The invention is described closer below by aid of some preferable embodiment examples in view of the drawings enclosed, in which

Fig. 1 illustrates a type of lightning pole, which is built up of segments according to invention provided with a movable chair,

Fig. 2 illustrates parts of Fig. 1 in a larger scale and a schematic principle illustration of the function using a rack,

5 Fig. 3 illustrates a pole or mast according to the invention which is built together by several sections according to the invention,

10 Fig. 4 illustrates the lower part of the mast structure according to Fig. 3 in a larger scale, and

Fig. 5 illustrates three part views of elements included in a pole according to the present invention.

15 As can be seen from Fig. 1,3 and 4 an improvement in or relating to a mast or pole 1 according to the invention is here illustrated and which consists of a number of sections 2, which are connected over and above each other and where each section 2 is built up of a lot of segments 3, which are fixed into position
20 to each other, said segments constitute a cross-section of the pole 1, which is mainly round formed. Each segment 3 according to the invention is here conically formed for constituting conical mast sections 2 of predetermined lengths, which by aid of flange formations 4' in their free end portions are connected
25 together with neighbouring, conical pole sections 2, which upper- and lower end portions 5,6 are cooperating in order to constitute a mast or pole 1 connected by a number of pole sections 2. Thanks to the low weight of the sections 2 constituting the ready pole 1 it is very suitable to be used as telemast. In
30 certain cases the mast can also be formed of one and the same integral section having conical or circular form.

Each segment 3 is provided with protruding flanges 4 along its longitudinal edges 7,8 which also can be seen from Fig. 2 and 5

by aid of which the segments 3 are fixed to each other and said flanges 4 are extended into a T-formation 9 in their free end portion 10 at the same time as that portion 11 of the flanges 4 which constitute a web 20 in said T-formation 9 are forming a rack 12, along which a movable chair or platform 13 for montage and service of the pole 1 and equipment existing on the same, can be placed. In Fig. 2 and 4 a rack 12 is illustrated in more detail and how it functions schematically and here is also illustrated a wire which can be placed within or outside the pole 1 for material which shall be transported upwards in the same. In the lower part of the pole 1 there is also an energy source 14 for the equipment provided on the same.

A lightning pole 1 is illustrated in Fig. 1 and 5, which is built up of two profile halves 15,16, which consist of a thin plate of stainless steel or other material, which for example has been edge pressed or roll formed to a form having edges. These profile halves 15,16 hereafter have been fixed to each other by aid of point welding to a suitable shearing strenght. Fig. 5 illustrates three part views in detail of a section through the pole 1 illustrated in Fig. 1 and from which the first view illustrates how the plate has been strengthened along its longitudinal bends 17 by a plate stiffener 18. Said plate stiffener can be formed quadratically as can be seen from the part views in Fig. 5. In the interspace which in this way are formed in the sections 3 or their profile halves 15,16 an isolation 19 can be placed. As can be seen from the part view in the middle, this plate stiffener 18 is provided within the pole 1 and here also can be seen the joints of the longitudinal segments 3 which are provided opposite each other. In the lower part view the T-formation 9 is illustrated in a larger scale, which is constituted by the protruding flanges 4 and in which the web 20 of the T-formation 9 a rack 12 is formed either directly or via a pre-fabricated unit, along which the movable

chair 13 for service and maintenance of the mast or pole and on the same existing equipment can be placed. The rack 12 can be formed as mentioned above, either directly in the material by stamping or profiling or it can also be prefabricated and after
5 that connected to the web 20 by aid of preferably point welding.

The chair 13 which is intended to be used for maintenance and montage of the mast or pole is illustrated in more detail in Fig. 1 and 2 and the same thus comprises a fastening means 21
10 having gears, so that the chair 13 is supported on the post 1 by aid of said T-formation 9 and said gears are intended to cooperate with the rack 12 in said web 20, said rack 12 extends mainly along the entire height of the pole 1. The movable chair
15 1 can be moved upwards and downwards along the pole 1 by aid of a manually driven gear-box of said gears or these gears can also be connected to an electric motor or the like which runs the movable chair 13.

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Claims

1. A pole consisting of at least two elongated segments (3) fixed in position to each other, which constitute mainly a round
5 formed cross-section of the pole (1), **characterized in** that each segment (3) along its elongated edges (7,8) comprises protruding flanges (4), by which said segments (3) are fixed to each other and said flanges (4) extend into a T-formation (9) in their free end portion at the same time as that portion of the flanges (4)
10 constituting the web (20) in said T-formation (9) constitutes a rack (12), along which a movable chair (13) for montage and maintenance of the pole (1) and on the same existing equipment, is supported.
- 15 2. A pole according to claim 1, **characterized in** that the rack (12) constituted by the web (20) of said flanges (4) is formed directly in the flange material by stamping or profiling.
3. A pole according to claim 1, **characterized in** the rack (12)
20 constituted by the web (20) of said flanges (4) is prefabricated and fixed to the web by aid of preferably point welding.
4. A pole according to claim 1, **characterized in** said pole (1) is built up of a number of prefabricated bow-shaped segments
25 (3), which are fixed to each other along their flanges (4).
5. A pole according to claim 1, **characterized in** each segment (3) is conically formed for constituting conical pole sections (2) having predetermined lengths, which by aid of flange
30 formations (4') in their free end portions are connectable to neighbouring, conical pole sections (2) adapted to each upper- and lower portion (5,6) in order to constitute a mast or pole (1) consisting of a number of sections.

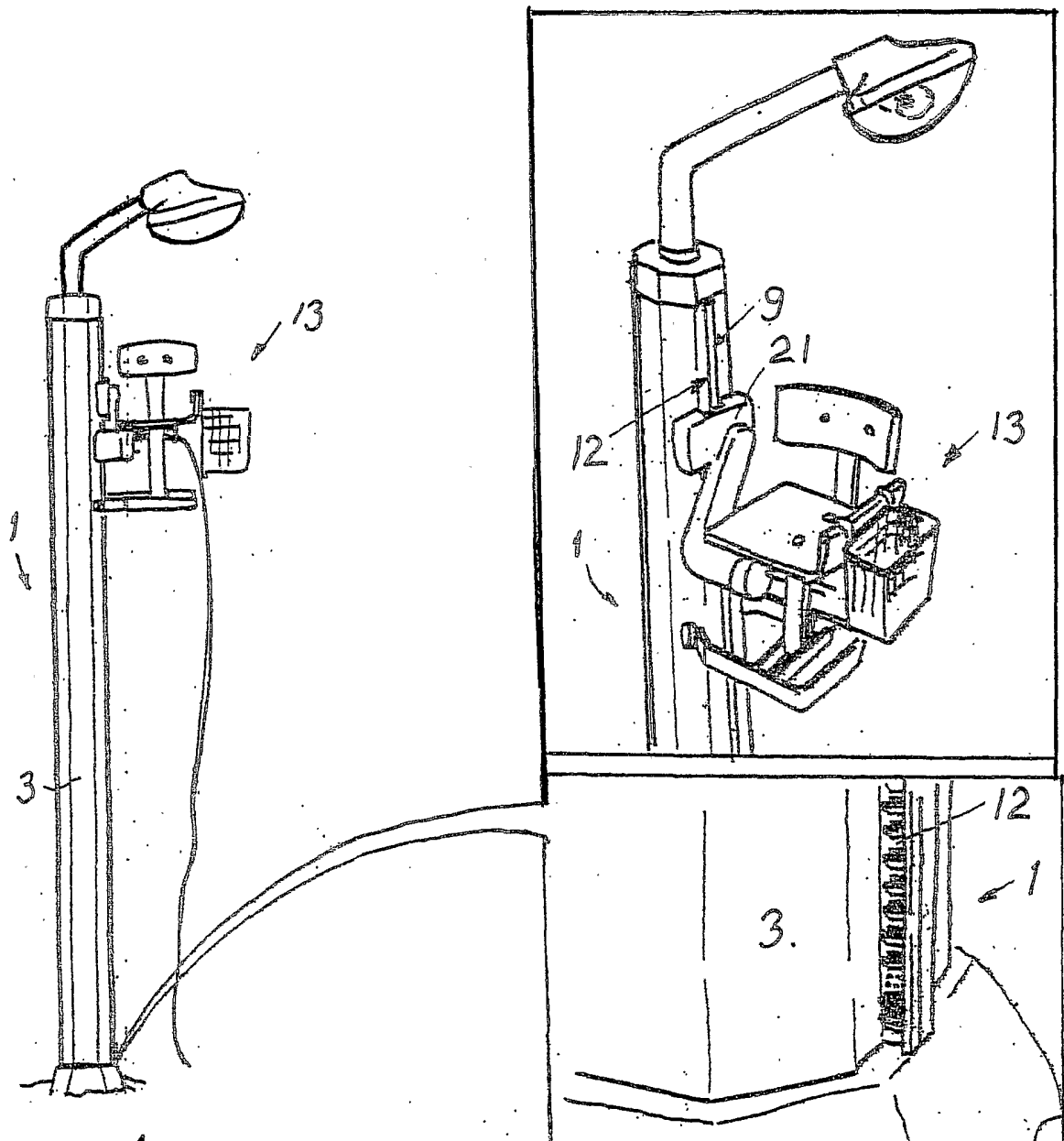


Fig. 1

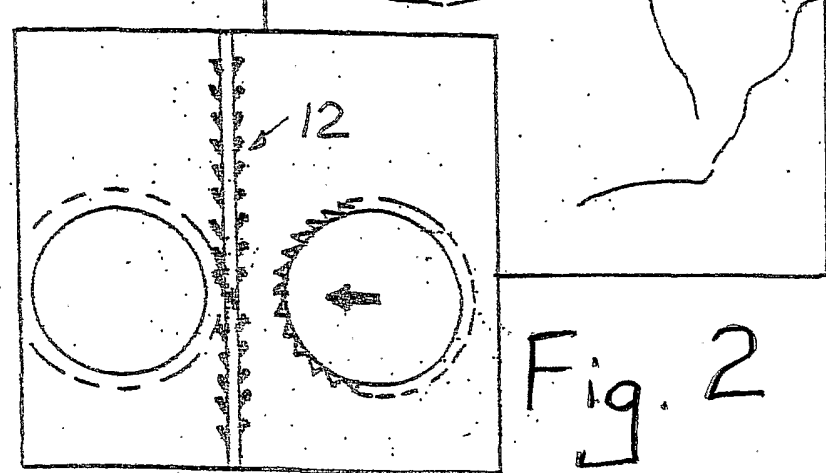


Fig. 2

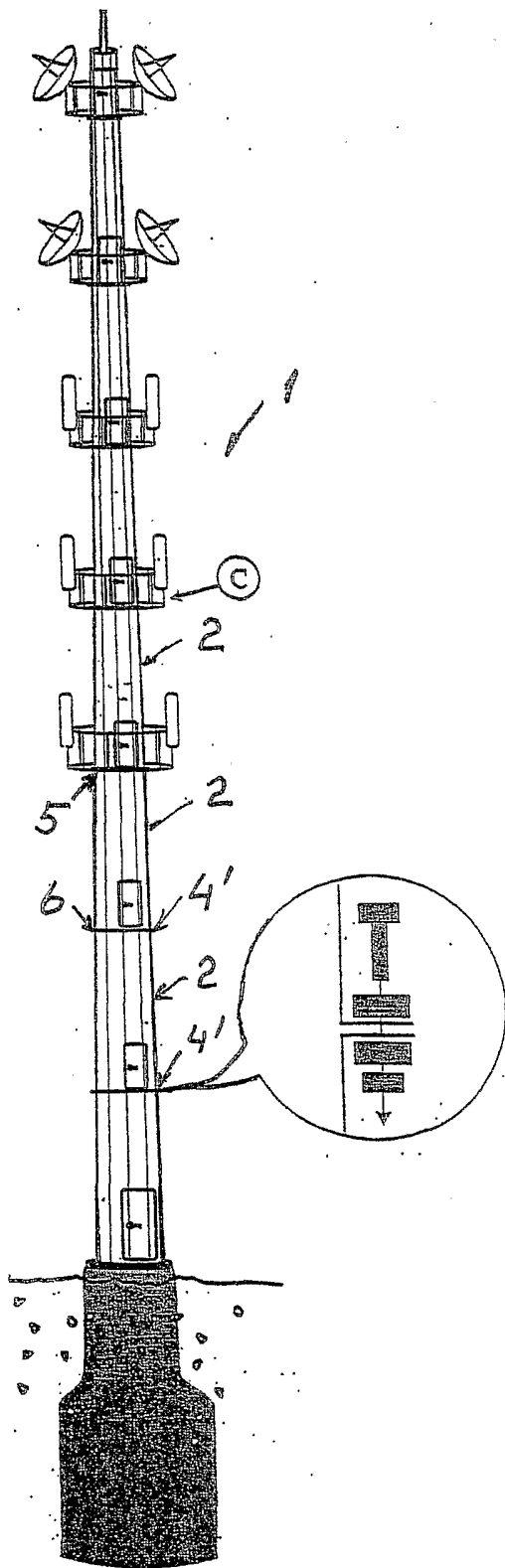


Fig. 3

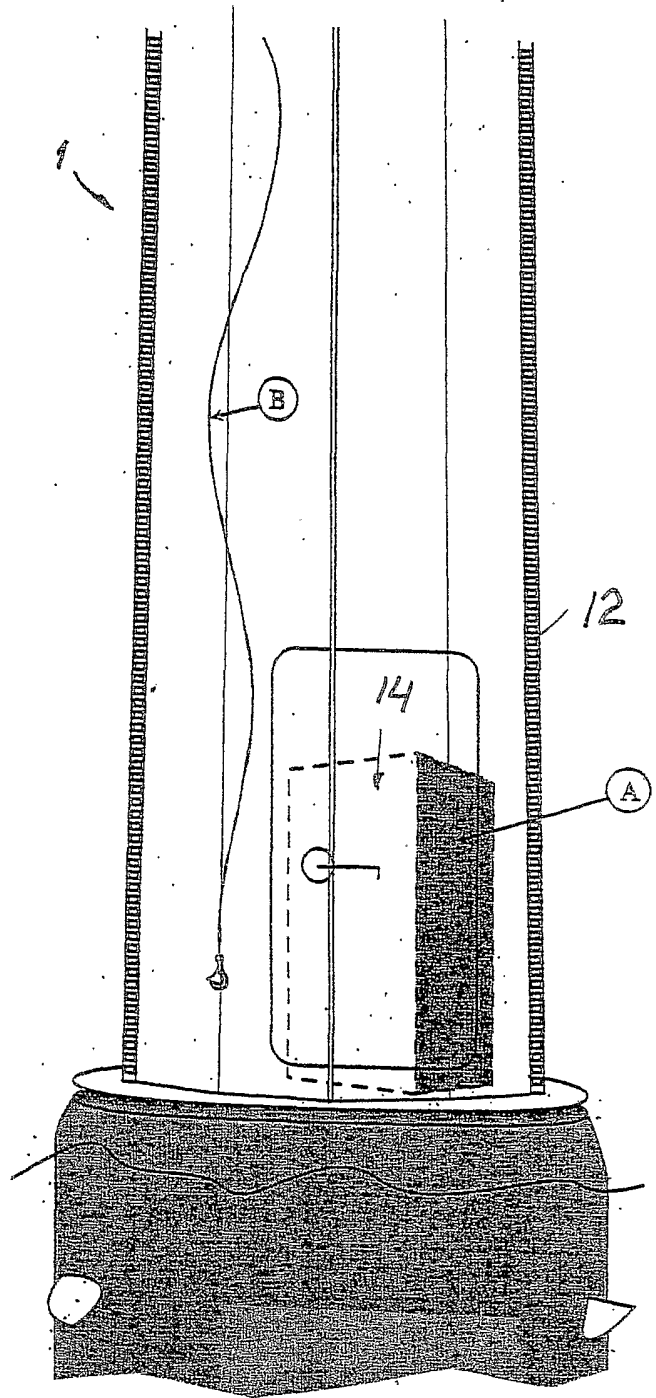


Fig. 4

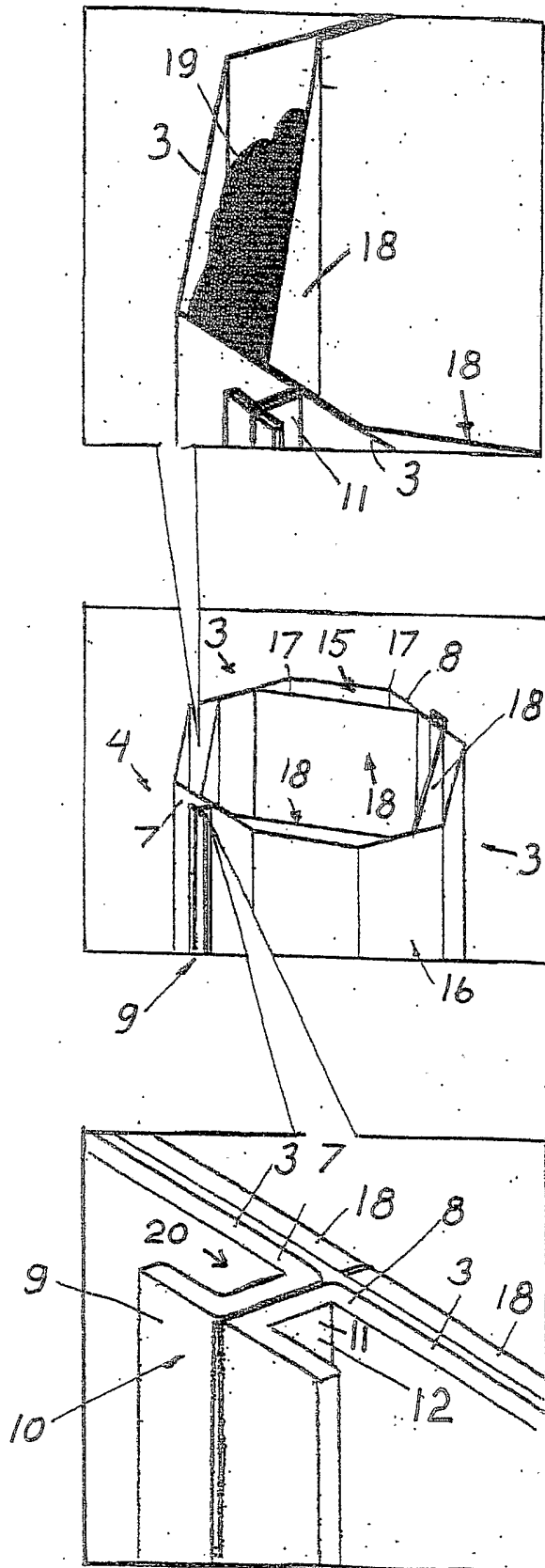


Fig. 5

INTERNATIONAL SEARCH REPORT

International application No.

PCT/SE 02/01017

A. CLASSIFICATION OF SUBJECT MATTER

IPC7: E04H 12/00

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: E04H

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	EP 0376167 A2 (ALOYS ZEPPENFELD GMBH & CO. KG), 4 July 1990 (04.07.90) --	1-5
A	EP 0399215 A1 (PAINE, D.L.), 28 November 1990 (28.11.90) --	1-5
A	US 3673402 A (R.P. WOODS), 27 June 1972 (27.06.72) --	1-5
A	US 5927440 A (G.D. FREEMAN), 27 July 1999 (27.07.99) -- -----	1-5

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

* Special categories of cited documents:

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"P" document published prior to the international filing date but later than the priority date claimed

"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

"X" document of particular relevance: the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance: the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

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INTERNATIONAL SEARCH REPORT
 Information on patent family members

06/07/02

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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 0376167 A2	04/07/90	SE 0376167 T3 AT 86940 T DE 3843996 A,C DE 58903820 D	15/04/93 28/06/90 00/00/00
EP 0399215 A1	28/11/90	CA 2014731 A DE 69016259 D,T JP 2296968 A US 4920710 A	25/10/90 02/11/95 07/12/90 01/05/90
US 3673402 A	27/06/72	NONE	
US 5927440 A	27/07/99	NONE	