



Europäisches Patentamt
European Patent Office
Office européen des brevets



(11)

EP 1 166 679 A1

(12)

EUROPEAN PATENT APPLICATION

(43) Date of publication:
02.01.2002 Bulletin 2002/01

(51) Int Cl.7: **A47B 57/54**

(21) Application number: **00113137.4**

(22) Date of filing: **29.06.2000**

(84) Designated Contracting States:
**AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU
MC NL PT SE**
Designated Extension States:
AL LT LV MK RO SI

(72) Inventor: **Aleardi, Daniele**
36075 Montecchio Maggiore (VI) (IT)

(74) Representative: **Bonini, Ercole**
**c/o STUDIO ING. E. BONINI SRL Corso
Fogazzaro 8**
36100 Vicenza (IT)

(71) Applicant: **S.A.F. snc di Aleardi Romano & C.**
36040 Grancona (VI) (IT)

(54) **Connection unit for the installation of shelves or support elements on bearing structures**

(57) The invention is a connection unit (1) for the installation of shelves or support elements (R) on bearing structures (S), which comprises a first sleeve (2) positioned externally with respect to said bearing structure (S) and a second sleeve (3) externally coupled to the first sleeve (2) through axial sliding. The surfaces (28, 33) of the sleeves (2, 3) in contact with each other have truncated cone-shaped longitudinal profile. The second sleeve (3) comprises two or more sectors (31, 32, 310, 320, 330, 340, 350), the longitudinal edges of which are provided with male/female coupling means (30) that are inserted one into the other by shifting them orthogonally to their surfaces, in such a way as to form the second sleeve (3) before this is externally coupled to the first sleeve (2) through axial sliding.

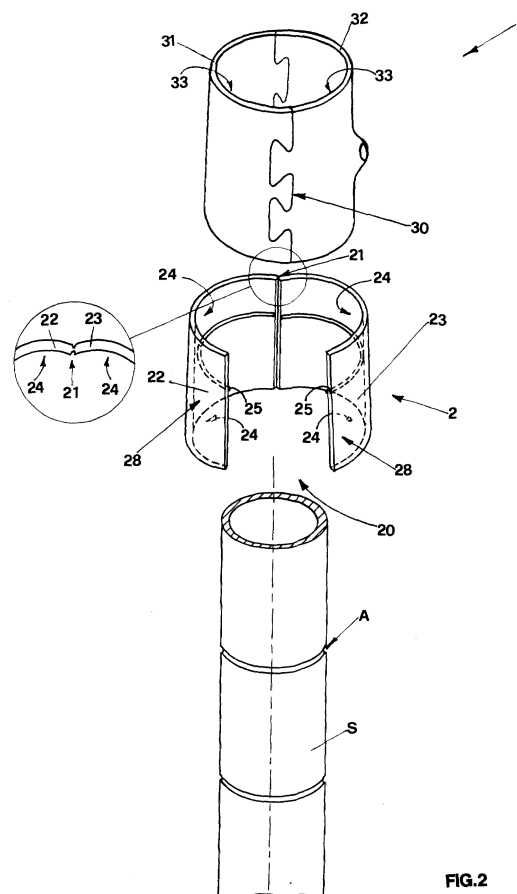


FIG.2

EP 1 166 679 A1

Description

[0001] The invention concerns a connection unit for the installation of shelves or support elements on bearing structures, particularly suitable for use when it is necessary to suspend objects from tubular bearing structures.

[0002] Sectional bearing structures are known that comprise tubular elements, which may also be removably connected to one another and to which it is possible to apply shelves or support elements by means of appropriate connection units.

[0003] In particular, the connection units are interposed between the tubular bearing element and the shelves, ensuring the correct anchorage and the stability of the latter.

[0004] Connection units are known, each one of which comprises two tubular sleeves suitable for being removably and coaxially coupled to the outside of the tubular bearing structure.

[0005] A first sleeve is generally made of plastic and envelops the tubular element partially or completely. Its external surface has the shape of a truncated cone tapering upwards and matching a corresponding tapering part of the inner surface of a second sleeve that is axially and externally coupled to it.

[0006] The assembly of the connection unit is carried out at the same time as the assembly of the tubular bearing structure.

[0007] More precisely, the operation is started by coaxially coupling the second tubular sleeve to the outside of the tubular bearing element during the assembly and fixing of the bearing structure. The first sleeve is then applied to the tubular element and finally the second sleeve is made slide axially, fitting it to the first sleeve, until the conical surfaces of each of them are coupled to each other.

[0008] The main drawback of the known connection units described above is represented by the fact that the whole connection unit cannot be completely removed without disassembling the bearing structure at least partially.

[0009] The described solution includes the possibility to remove the first sleeve without necessarily removing the second sleeve. In fact, if the bearing element has its ends fixed, for example, to an anchorage structure or to a wall or to any surface, the second sleeve cannot be withdrawn from the bearing element.

[0010] For the same reasons, also the addition of another connection unit requires the partial or complete disassembly of the structure.

[0011] A further drawback is due to the fact that the known connection unit do not ensure the interchangeability of the shelves, which reduces the functionality of the connection unit.

[0012] The present invention aims at eliminating the drawbacks of the known technique.

[0013] More precisely, one aim of the invention is the

implementation of a connection unit for the installation of shelves or support elements on bearing structures that can be applied or removed, even if the bearing structure has both ends connected to anchorage structures, with no need to partially or completely remove the structure.

[0014] Another aim is the implementation of a connection unit that ensures the interchangeability of the shelves or of the support elements applied to it; said shelves should be interchanged quickly and without using tools.

[0015] Another important aim is the implementation of a connection unit that ensures easy application to the bearing structure of any type of object.

[0016] The aims mentioned above have been achieved through the implementation of a connection unit for the installation of shelves or support elements on bearing structures that, according to the main claim, comprises a first sleeve positioned outside said bearing element and a second sleeve suitable for being coupled to the outside of said first sleeve through axial sliding, the surfaces of said sleeves that are in contact with each other having truncated cone-shaped longitudinal profile, characterized in that said second sleeve comprises two or more sectors, the longitudinal edges of which are provided with male/female coupling means that are inserted one into the other by shifting them orthogonally to the surfaces of the sectors to which they belong, in such a way as to form said second sleeve before this is coupled to the outside of said first sleeve through axial sliding.

[0017] To advantage, the connection unit which is the subject of the invention enables the installation and removal of shelves, support elements or other similar objects with no need to alter the bearing structure.

[0018] The goals and advantages described above will be highlighted in greater detail in the description of some among many possible applications of the invention in question, illustrated in the attached drawings, wherein:

- Figure 1 shows the connection unit subject of the invention applied to a bearing structure;
- Figure 2 is an axonometric exploded view of the connection unit shown in Figure 1;
- Figure 3 shows a longitudinal section of the connection unit of Figure 2;
- Figure 4 shows a component of the connection unit of Figure 2;
- Figures from 5 to 7 show the assembly of the connection unit of Figure 2;
- Figures from 8 to 15 show some variant applications of the connection unit of Figure 3;
- Figures 16 and 17 show different structures that can be obtained by using the connection unit of Figure 1.

[0019] The connection unit which is the subject of the invention, indicated as a whole by 1, is shown in Figure 1, wherein, as it can be observed, it is used to obtain a

column C comprising a tubular bearing element S that by means of the connection unit 1 supports shelves R on which objects are positioned, which for example are constituted by floral compositions O.

[0020] The connection unit 1, as shown in Figure 2, comprises a first sleeve 2, which can be externally coupled to the bearing element S, and a second sleeve 3 suitable for being externally coupled to the first sleeve 2.

[0021] In particular, the first sleeve 2 is constituted by two shells 22, 23 joined by a longitudinal rib 21 that ensures their reciprocal rotation, so that an opening 20 can be obtained, which makes it possible to apply them outside the bearing element S.

[0022] The surfaces 28 and 33 of the sleeves 2 and 3, which are visible in Figure 3, are in contact with each other, have truncated cone-shaped longitudinal profile, can be matched and are diverging in the downward direction.

[0023] According to the invention, the second sleeve 3 comprises two sectors 31 and 32, each one of which is provided with male-female coupling means 30 obtained on its longitudinal edge, said coupling means being inserted one into the other by shifting them orthogonally to the surfaces of the sectors 31 and 32 to which they belong, in order to form the second sleeve 3 before it is externally coupled to the first sleeve 2 through axial sliding.

[0024] More precisely, the male-female coupling means 30 provided in each sector 31 and 32 visible in detail in Figure 4 respectively comprises protrusions 34 and recesses 35 that are practically trapezoidal, have rounded corners and can be matched.

[0025] According to other applications of the invention, the protrusions and recesses can have broken mixed or curved profile.

[0026] The external surface of each sector 31, 32 is provided with fastening means 38 constituted by through holes visible in Figure 3 and suitable for housing the screws V that fasten the shelves R.

[0027] In the application described herein the inner surface 24 of the first sleeve 2 is provided with an annular edge 25 suitable for being fitted into a corresponding annular recess A present on the bearing element S, when the sleeve 2 is externally coupled to the latter.

[0028] According to a further application of the invention, the first sleeve 2 can be constituted by a plurality of independent shells or form a single unit together with the bearing structure S.

[0029] Practically, the anchorage of the connection unit 1 to the bearing structure S requires first of all the positioning of the first sleeve 2 on the bearing element S.

[0030] More precisely, the operator reciprocally separates the shelves 22 and 23 by rotating them around the rib 21 and connects them to the outside of the bearing element S, making the annular edge 25 fit into the annular recess A. At this point he releases the two shells 22 and 23, which owing to their own elasticity return to their original position and form the sleeve 2 again, as

shown in Figure 5.

[0031] The operator then arranges the two sectors 31 and 32 outside the bearing element S, as shown in Figure 6, at first by radially bringing them near each other until the protrusions 34 and the recesses 35 are superimposed, then shifting them orthogonally to the surfaces of the sectors themselves in diametral direction, in such a way as to insert each protrusion 34 into the corresponding recess 35 and to form the second sleeve 3.

[0032] Finally the operator, as shown in Figure 7, shifts the second sleeve 3 axially along direction B, until coupling its inner surface 33 to the outer surface 28 of the first sleeve 2, thus closing the sectors 31 and 32 outside the first coupling 2.

[0033] Once the coupling has taken place, the connection unit 1 can withstand any reasonable force G that may be applied to the second sleeve 3 in axial direction. In this situation, in fact, the tapering of the touching surfaces 28 and 33 of the two sleeves 2 and 3 is such as to resolve the force G into a component radial to the bearing element S, making the inner surface 24 of the first sleeve 2 match the outer surface of the bearing element S and generating a friction force that balances the force G.

[0034] Obviously, the transversal section of the bearing element S is preferably circular but can have any shape, and the annular protrusion 25 must not necessarily be present on the sleeve 2, since it is not indispensable for the functionality of the connection unit 1.

[0035] The Figures from 8 to 15 show as many variant applications of the connection units suitable for the installation of the different shelves R used. More precisely, Figure 8 shows a variant application of the connection unit subject of the invention that differs from the application described above due to the fact that one of the half-shells, indicated as a whole by 310, is provided with two protrusions 41 on the top of which a through hole 42 has been made to ensure the installation - by means of a screw not represented in the figure - of the bearing element 43 if this comprises a curved tubular element 44 defining a slit 45 suitable for housing the board T, as shown in Figure 13.

[0036] Figure 9 shows a variant application of the connection unit subject of the invention that differs from the application described above due to the fact that one of the half-shells, indicated as a whole by 320, is provided with two protrusions 47 positioned transversally with respect to the sector 31 in which as many through holes 46 have been made in order to install the bearing element 48, always by means of a screw not represented in the figure. The bearing element 48, in this case, is constituted by a tubular element bent in such a way as to form a practically circular element suitable for housing a flowerpot or a container Q, as shown in Figure 14.

[0037] Figure 10 shows a variant application of the connection unit subject of the invention that differs from the application described above due to the fact that one of the half-shells, indicated as a whole by 330, is pro-

vided with four protrusions 49, on each one of which a through hole 50 has been made to ensure the coupling to two bearing elements 44 of the type shown in Figure 8.

[0038] Figure 11 shows a variant application of the connection unit subject of the invention that differs from the application described above due to the fact that one of the half-shells, indicated as a whole by 340, is provided with protrusions 51 suitable for being housed into a corresponding recess obtained on the bearing element 54.

[0039] Figure 12 shows a variant application of the connection unit subject of the invention that differs from the application described above due to the fact that one of the half-shells, indicated as a whole by 350, is provided with two elements 51 suitable for coupling to as many bearing elements 54.

[0040] Figure 15 shows a further variant application of the invention, in which a different bearing element 52 suitable for supporting practically cylindrical containers is represented.

[0041] Finally, Figures 16 and 17 show two structures in which the connection unit 1 is used to obtain a multifunctional unit and a clothes-stand, respectively.

[0042] It is also important to observe how, if the bearing element S has circular section, the coupling of the connection unit to the bearing structure allows the connection unit to rotate axially by exploiting the friction created in this situation by the first sleeve 2.

[0043] In a further application of the invention, the coupling means, either male and female, can partially or completely belong to one of the two sectors 31 and 32.

[0044] Variant applications of the invention may comprise any number of sectors to constitute the second sleeve 3 and include the first sleeve 2 as integral part of the bearing element S.

[0045] Furthermore, it is important to observe that the second sleeve 3 may be provided with any number of ribs 21 and may be constituted by independent half-shells that, during the assembly, must be coupled one by one to the outside of the bearing element S, in such a way as to envelop it at least partially.

[0046] Upon implementation changes may be necessary that are to be regarded as completely protected by the present patent, provided that they are based on the same innovative concept illustrated in the above description and in the following claims.

Claims

1. Connection unit (1) for the installation of shelves or support elements on bearing structures (S), which comprises a first sleeve (2) arranged externally to said bearing element (S) and a second sleeve (3) suitable for being externally coupled to said first sleeve (2) through axial sliding, the surfaces (28,

33) of said sleeves (2, 3) that are in contact with each other having truncated cone-shaped longitudinal profile,

characterized in that said second sleeve (3) comprises two or more sectors (31, 32, 310, 320, 330, 340, 350) provided with male-female coupling means (30) obtained on the longitudinal edges of the sectors (31, 32, 310, 320, 330, 340, 350), said coupling means being inserted one into the other by shifting them orthogonally to the surfaces of the sectors (31, 32, 310, 320, 330, 340, 350) to which they belong, to form said second sleeve (3) before this is externally coupled to said first sleeve (2) through axial sliding.

2. Connection unit (1) according to claim 1, **characterized in that** said male-female coupling means (30) are respectively constituted by protrusions (34) and recesses (35) with broken mixed or curved profile and these profiles can be matched.

3. Connection unit (1) according to claim 1, **characterized in that** said first sleeve (2) is provided with a longitudinal opening (20) for the coupling to said bearing elements (S).

4. Connection unit (1) according to claim 1, **characterized in that** said first sleeve (2) comprises two or more shells (22, 23) connected to one another by means of longitudinal ribs (21) suitable for ensuring that they can be reciprocally moved away from one another.

5. Connection unit (1) according to claim 1, **characterized in that** said two or more shells are independent of one another.

6. Connection unit (1) according to claim 1, **characterized in that** said bearing element (S) is externally provided with one or more annular recesses (A) that are spaced and parallel to one another, each one of which is suitable for housing a corresponding annular edge (25) provided on the inner surface (24) of said first sleeve (2).

7. Connection unit (1) according to claim 1, **characterized in that** said bearing element (S), said first sleeve (2) and said second sleeve (3) have practically circular transversal sections.

8. Connection unit (1) according to claim 1, **characterized in that** said sectors (31, 32, 310, 320, 330, 340, 350) are provided with fastening means (38, 41, 47, 49, 51) for the shelves (R, 44, 48, 54).

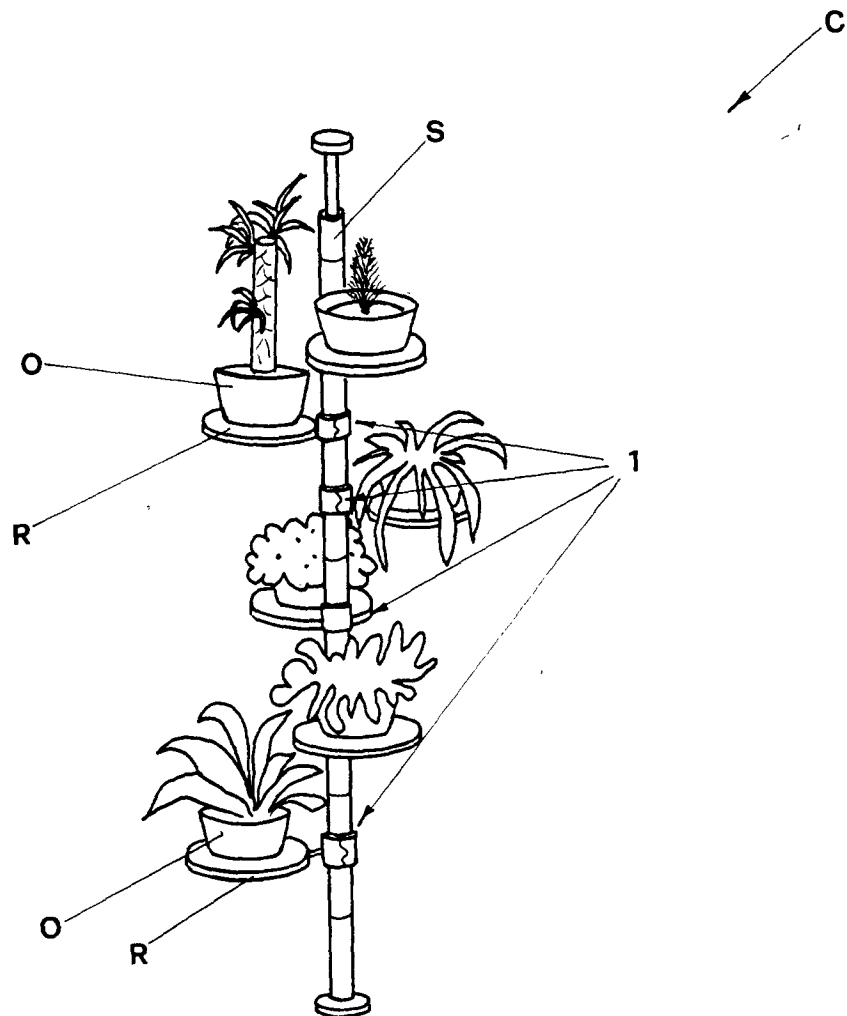


FIG.1

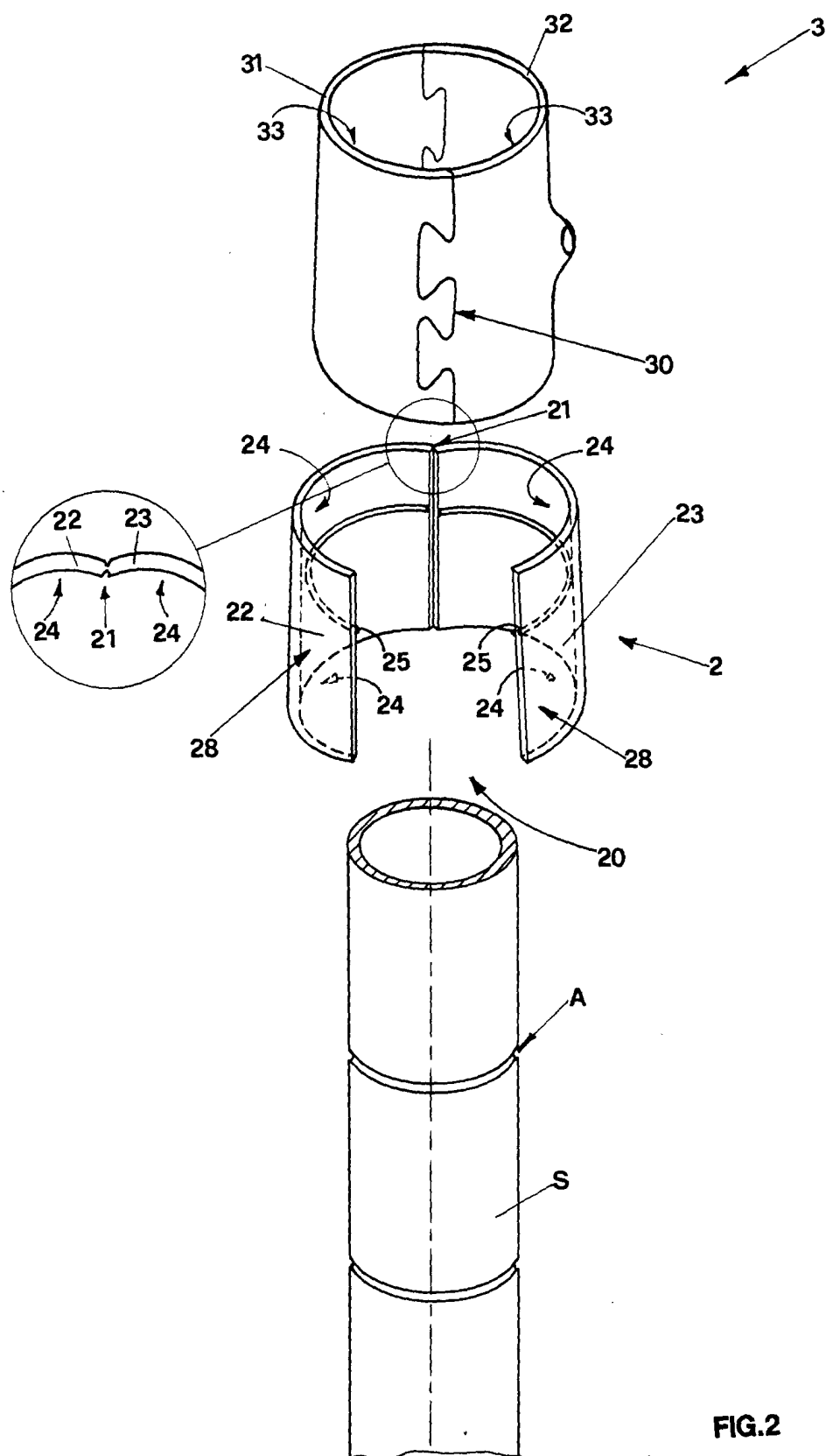
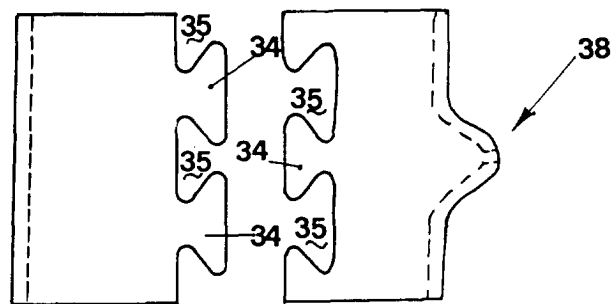
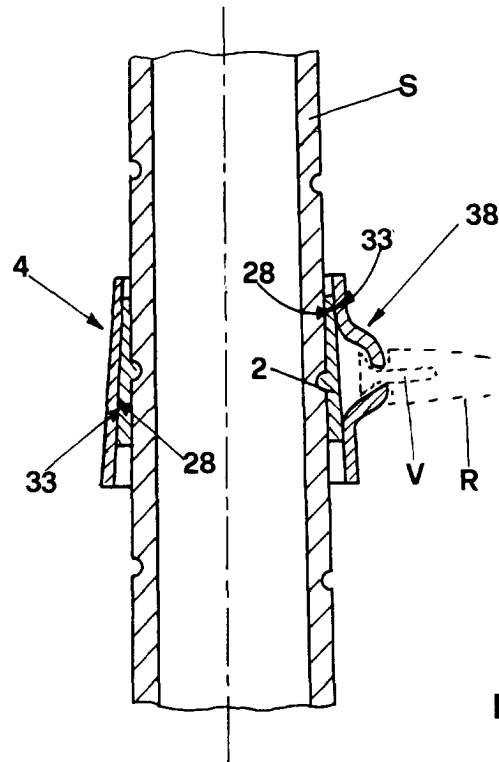


FIG.2



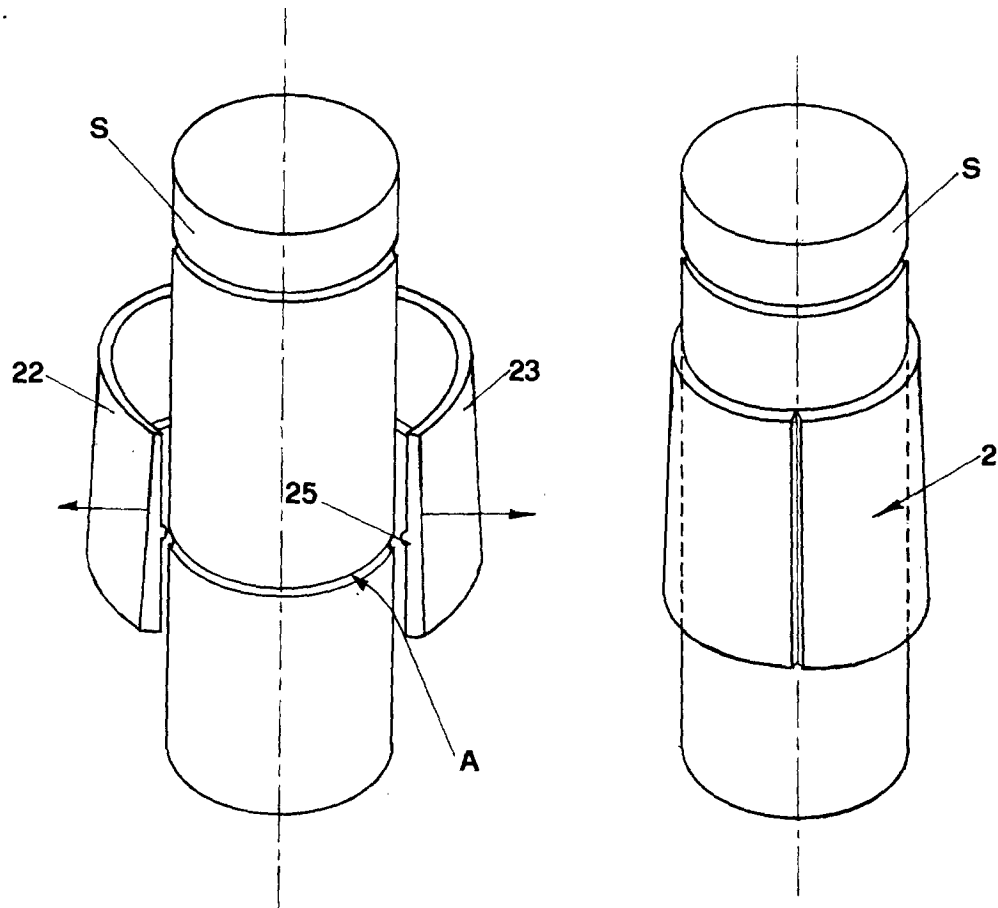


FIG.5

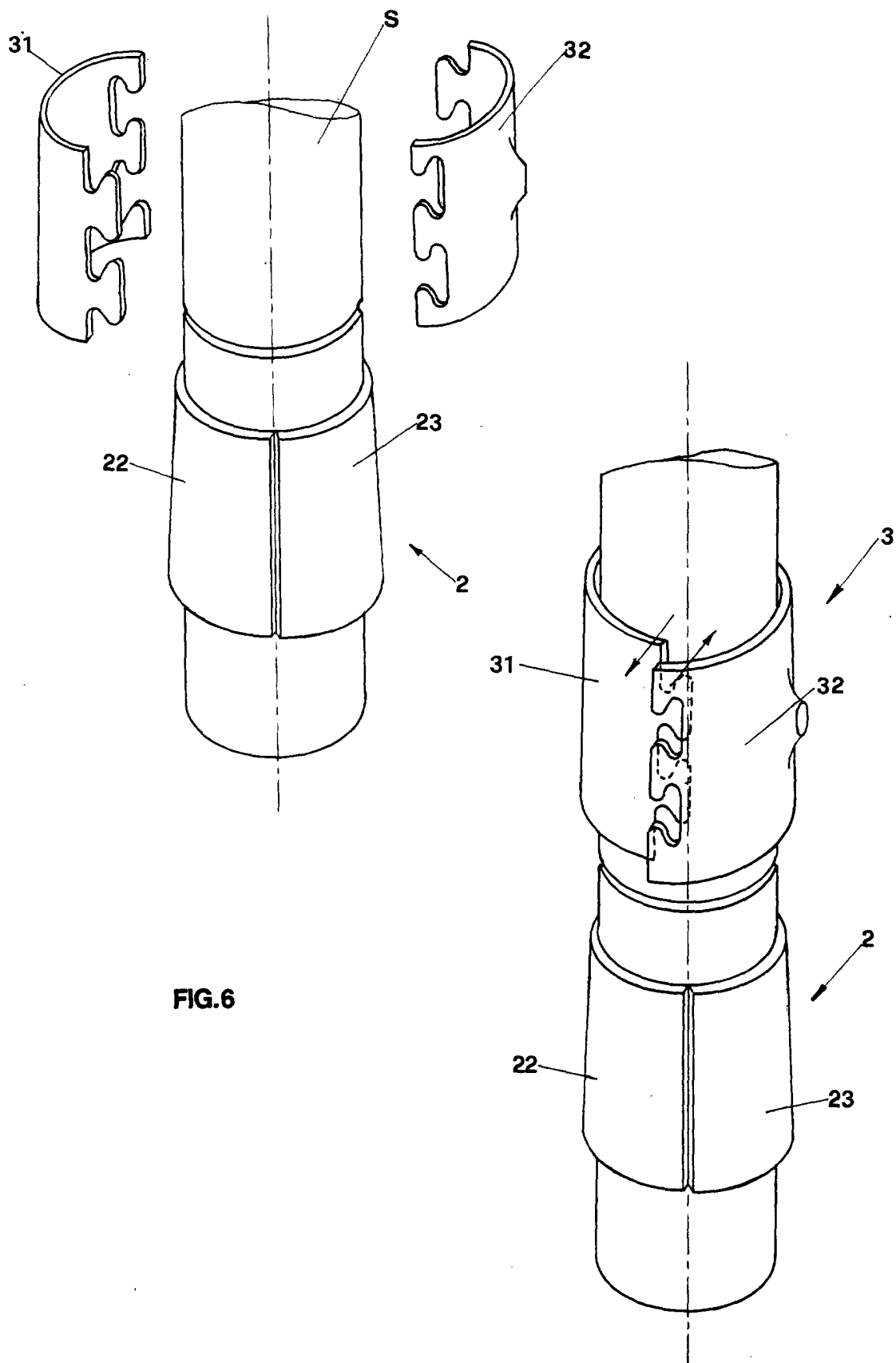


FIG.6

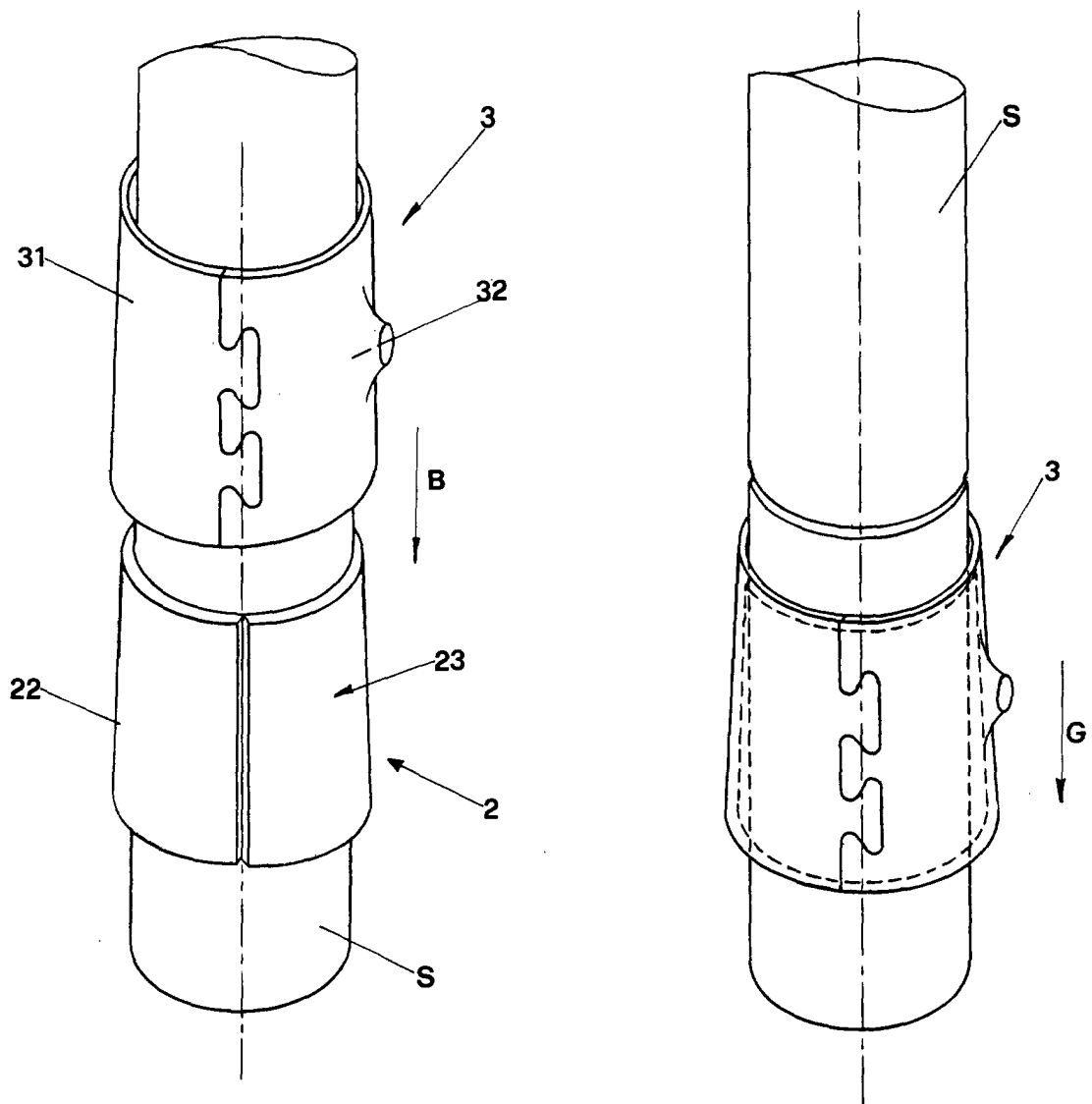
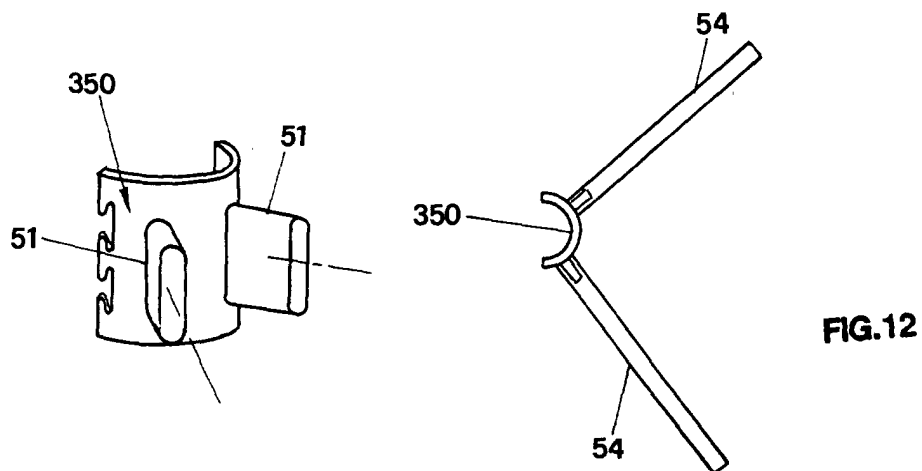
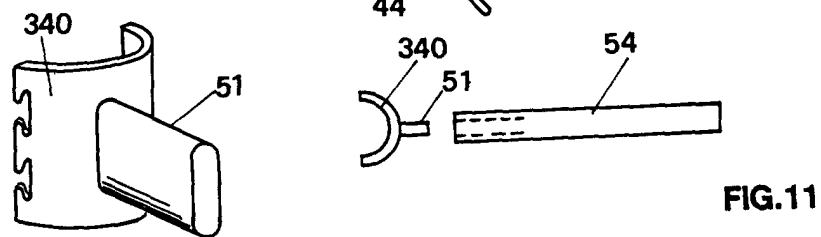
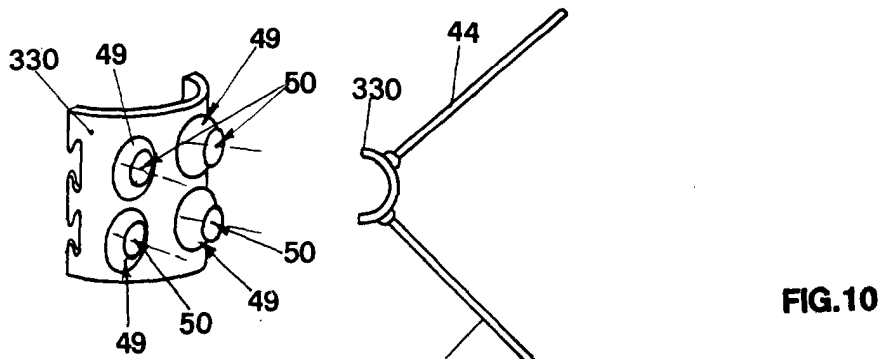
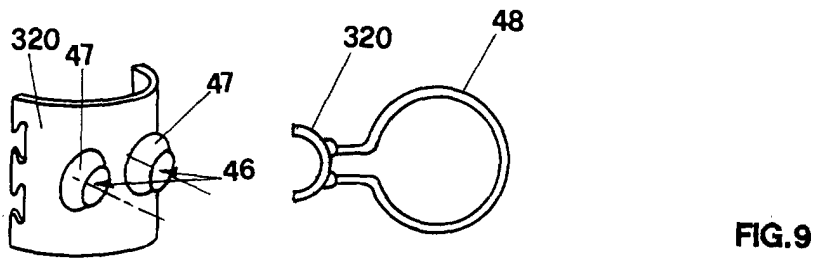
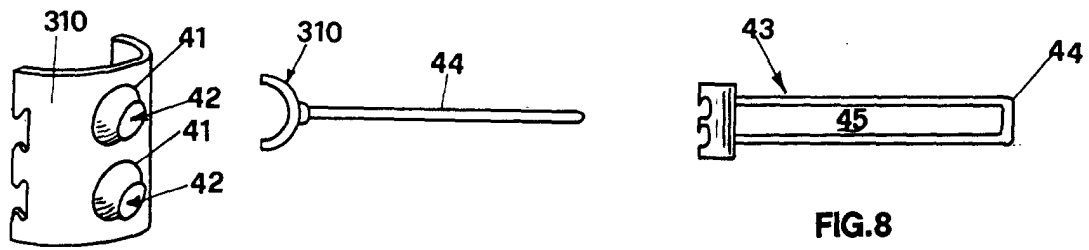
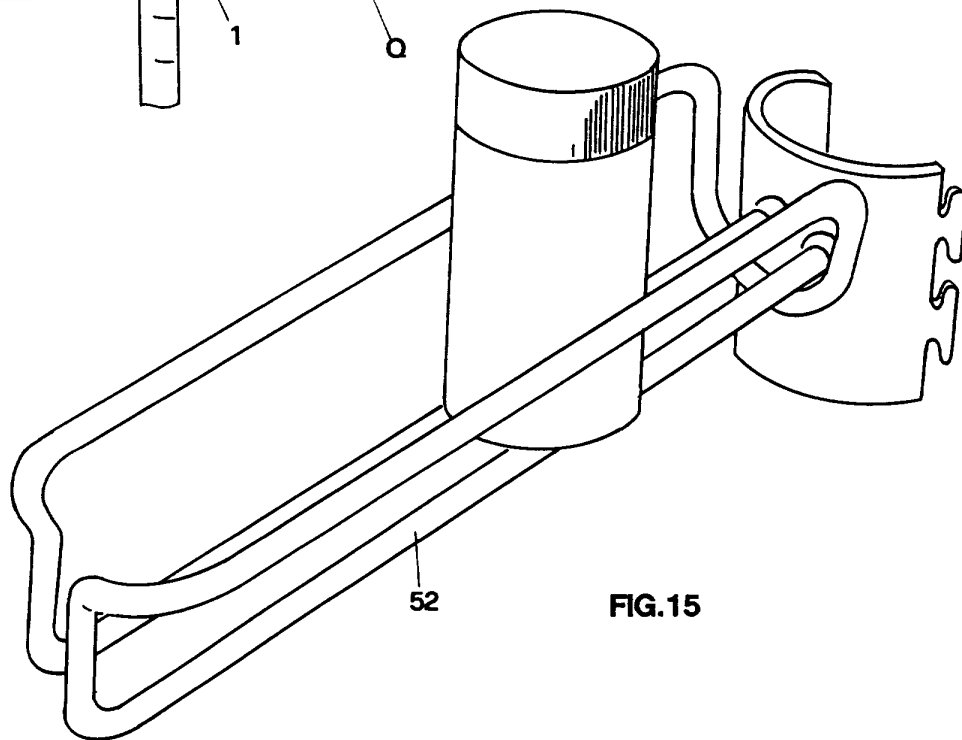
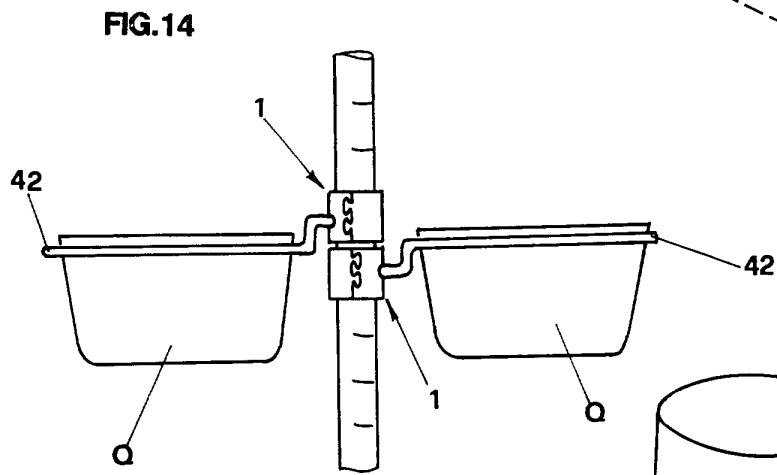
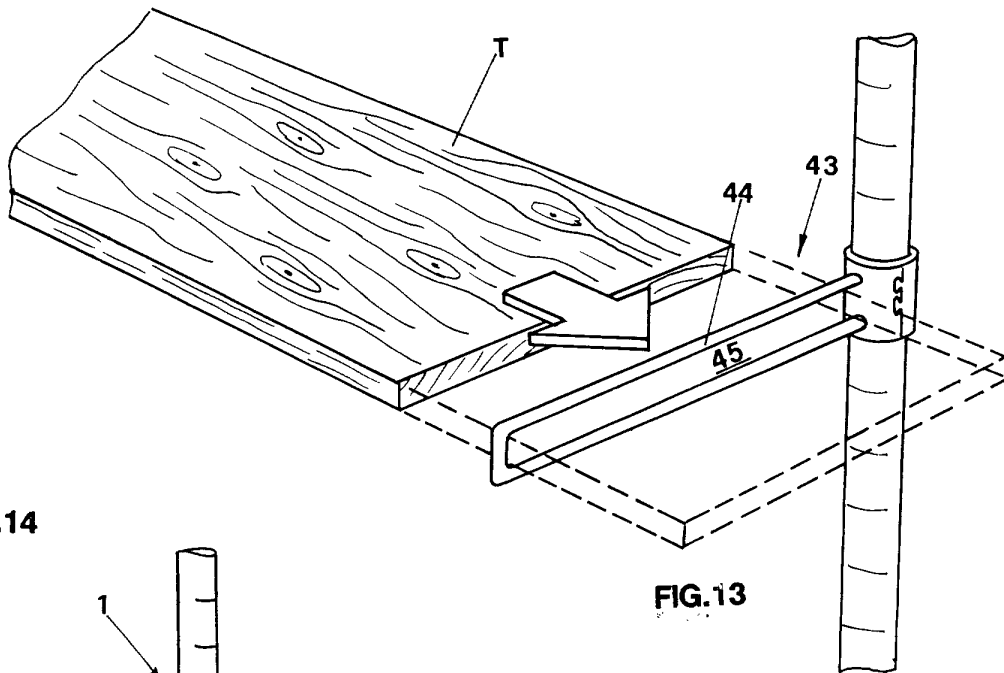


FIG.7





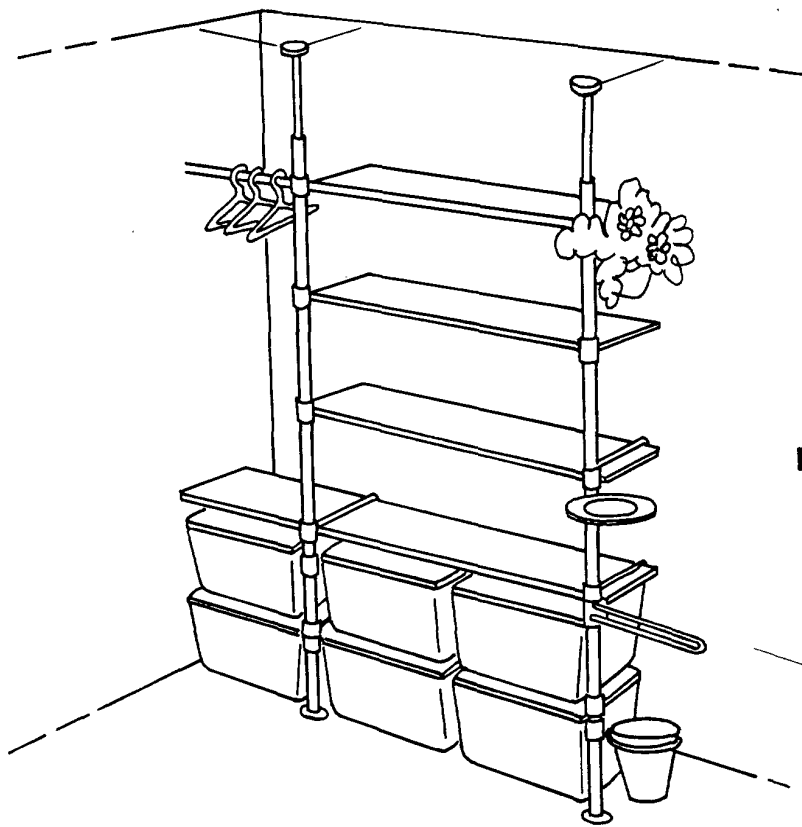


FIG. 16

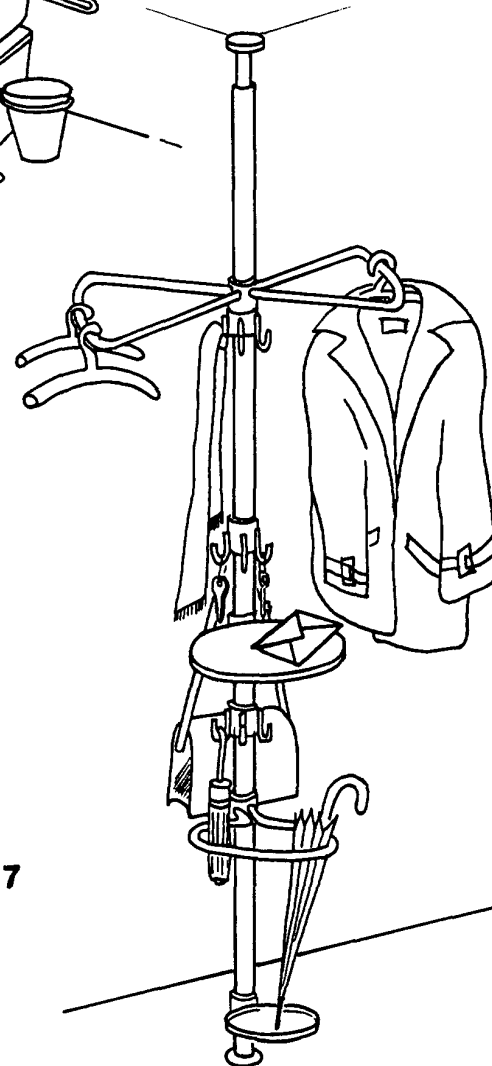


FIG. 17



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 00 11 3137

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
X	DE 299 19 093 U (YANG) 13 January 2000 (2000-01-13)	1,2,5-7	A47B57/54
Y	* page 3, last paragraph - page 4, paragraph 2; figures 1-5 *	3,4	
Y	US 6 068 143 A (WANG CHANG CHOU) 30 May 2000 (2000-05-30)	3,4	
A	* abstract; figures 2,5 * * column 2, last paragraph - column 3, paragraph 1 * * column 2, line 39 - line 53 *	1,4-8	
A	US 5 924 581 A (CHEN HENRY) 20 July 1999 (1999-07-20) * column 2, last paragraph - column 3, paragraph 4; figures 2-5 *	1,5-8	
			TECHNICAL FIELDS SEARCHED (Int.Cl.7)
			A47B
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 29 November 2000	Examiner Jones, C
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

EPO FORM 1503 03/92 (P04001)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 00 11 3137

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

29-11-2000

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
DE 29919093 U	13-01-2000	NONE	
US 6068143 A	30-05-2000	NONE	
US 5924581 A	20-07-1999	NONE	

EPO FORM P0489

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82