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(54) **Storage units**

(57) A set of components for the construction of a shelf assembly comprises at least four uprights of a length approximating to a predetermined shelf spacing, at least one shelf member, and a plurality of locating members engageable with the uprights and provided with locating means engageable with the or each shelf

member to form a shelf assembly supported on the uprights. The locating means may define sockets adapted to at least partially surround end portions of the associated uprights, each socket being adapted to receive an upper end of one upright and a lower end of another upright whereby to interconnect the uprights in vertical alignment with one another.

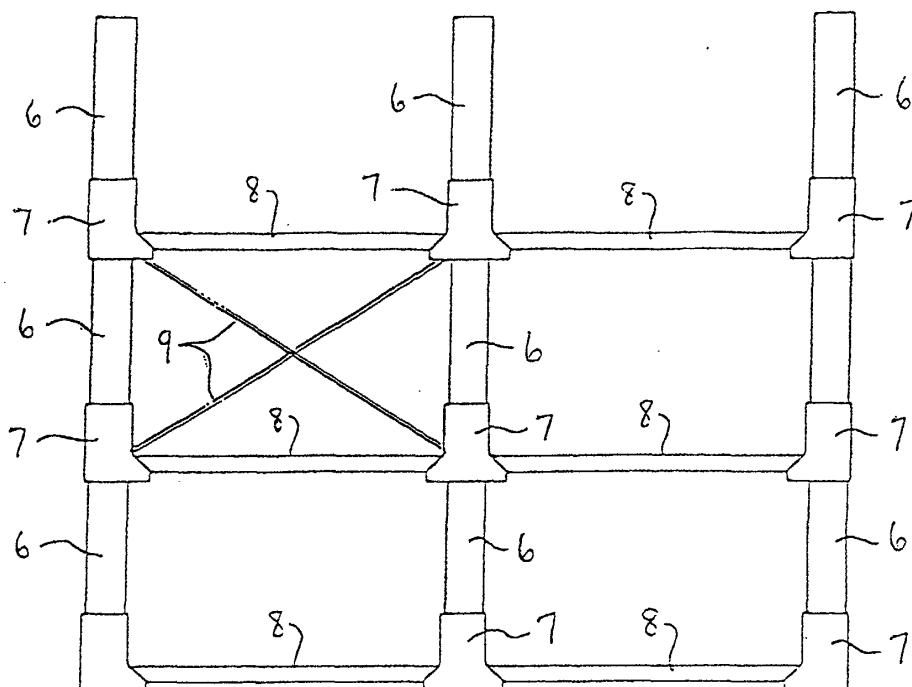


FIG. 1

## Description

**[0001]** This invention relates to free-standing storage units and particularly storage units in the form of shelving.

**[0002]** Various systems have previously been proposed for constructing shelving from kits of components. One such system includes a plurality of support members adapted to be attached to a wall or like structure and to which shelf members are attached by means of brackets engageable with the support members. Such arrangements require the use of tools to effect assembly, result in damage to the fabric of the wall or other support and are not readily moved from one location to another.

**[0003]** It has also been proposed to construct shelf units from a plurality of timber uprights between which shelf members are mounted to form a free-standing assembly. Such arrangements also require the use of tools to effect assembly and can be erected to form an assembly of only one predetermined height and width. Such systems are not readily disassembled and can only be relocated in locations where wall space of the same dimensions is available.

**[0004]** The present invention provides a set of components for the construction of a shelf assembly and comprising at least four uprights of a length approximating to a predetermined shelf spacing, at least one shelf member, and a plurality of locating members engageable with said uprights and provided with locating means engageable with the or each shelf member to form a shelf assembly supported on the uprights.

**[0005]** Preferably the set of components includes at least two and preferably four further uprights and at least one further shelf member, said locating members being so constructed as to enable interconnection of the components to provide a shelf assembly having adjacent shelves alongside or above one another as desired.

**[0006]** Preferably the set of components incorporates a multiplicity of uprights and of shelf members together with locating members adapted to be interconnected to form a plurality of alternative shelf assemblies having different arrangements of shelves dependent on user requirements.

**[0007]** Each shelf member may be formed from a plurality of plank members, adapted to be disposed in side by side relation to form the shelf member. Preferably the shelf members or plank members are formed by extrusion from synthetic plastics material and provided with internal reinforcement.

**[0008]** Preferably each locating member is adapted to engage a pair of said uprights and to space same apart by a predetermined distance to form an end support for the, or one section of the, completed shelf assembly. The locating members advantageously define sockets adapted to at least partially surround end portions of the associated uprights, each socket being adapted to receive an upper end of one upright and a lower end of

another upright whereby to interconnect said uprights in vertical alignment with one another. A plurality of uprights and locating members may be assembled in this way to produce shelf assemblies of a variety of different heights.

**[0009]** Preferably said locating means comprises a shelf support member projecting laterally from the associated locating member and at least one detent member projecting upwardly from the shelf support member and engageable in a recess formed in the underside of an associated shelf member. Preferably at least two detent members are provided for engagement with each shelf member.

**[0010]** The invention also provides a shelf assembly constructed from a set of components as aforesaid.

**[0011]** An embodiment of the invention will now be described, by way of example only, with reference to the accompanying drawings, in which:-

Fig. 1 is a front elevation of a shelf assembly constructed from components according to the invention;

Fig. 2 is an exploded perspective view showing components from which an assembly according to Fig. 1 may be constructed;

Fig. 3 is an enlarged fragmentary view of one end of a shelf member showing the internal construction;

Fig. 4 is a vertical cross-section through part of a locating member shown in Fig. 2 showing an upright engaged therewith; and

Fig. 5 is a perspective view of part of a locating member with parts broken away to show the internal construction.

**[0012]** Referring to the drawings, Fig. 1 shows a self-standing shelf assembly 5 constructed from a plurality of uprights 6 interconnected by locating members 7 between which shelves 8 extend. The unit is assembled from a plurality of the components 6, 7 and 8 interconnected, in the illustrated example, to form a unit having a base and shelves at two heights each consisting of two shelf members arranged alongside one another. As will be described hereafter, the same components may be employed to produce a variety of heights and widths of shelf unit adapted to different locations. While the construction of the components is such as to produce a relatively rigid self-standing structure, additional rigidity may be imparted, if desired, by means of cross braces 9.

**[0013]** Referring to Fig. 2 of the drawings, each of the uprights 6 comprises a hollow box-like member of square cross-section and of a length approximating to the desired distance between vertically spaced shelves of the assembled unit. Since in most instances the as-

sembled unit will consist of at least two and possibly three or more shelves spaced vertically above one another, the lengths of the uprights are relatively short compared to the likely overall height of most shelf units to be assembled from the components. This is a beneficial feature which will be referred to subsequently hereafter.

**[0014]** Each pair of uprights 6 are spaced apart and interconnected by a locating member 7 comprising a pair of sockets 10 interconnected by a shelf support member 11. Each of the sockets 10 is shaped and dimensioned to receive an end of an associated upright 6, the construction of the sockets 10 being such that they are supported on the upper ends of lower uprights 6 and are adapted in turn to support the lower ends of upper uprights 6. For this purpose, as shown in Figs. 4 and 5, a cylindrical collar 12 is mounted within and spaced from the side walls of the sockets 10 part way along their length, the collar 12 having upwardly and downwardly projecting ends 13A and 13B adapted to engage within the ends of associated uprights 6. In this manner the upper ends of lower uprights 6 support the locating members 7 which in turn support the lower ends of the uprights above. Several uprights may be interconnected vertically by locating members 7 in this manner to provide end supports for shelf units of a variety of different heights.

**[0015]** In the illustrated embodiment, each shelf member 8 is formed from three plank members 14, opposite ends of which are supported on the shelf support members 11 which interconnect each pair of sockets 10. The plank members 14 are formed from synthetic plastics material by extrusion and are of hollow construction provided with internal reinforcing ribs 15 (Fig. 3). The lengths and wall thicknesses of the planks are selected such as to minimise bowing of the shelf members 8 under the maximum load recommended for use with the assembled unit.

**[0016]** Inclined web members 16 divide each shelf support member 11 into three sections corresponding in width to the respective plank members 14. Pairs of apertures 17A are formed in the under surface of each end of each plank member 14 and are adapted to locate over upwardly projecting detents 18 on the shelf support member 11. The plank members 14 thus link and space apart the locating members 7 at each level of the assembled unit by a distance equal to the length of the plank members.

**[0017]** As best seen in Fig. 3, the plank members 14 are provided with additional internal longitudinally-extending, horizontal web members 19 incorporating apertures 17B corresponding in shape and size to and aligned with the apertures 17A. The length of the detents 18 on the shelf support members 11 is such that, when the plank members 14 are engaged with the shelf support members, the detents 18 engage the apertures 17A and 17B. This considerably increases rigidity and resistance to bowing of the plank members 14 compared with

the position where the apertures 17A only provided.

**[0018]** In assembling a shelf unit from the components, end supports are first constructed from a desired number of uprights 6 and locating members 7, following which the end supports are connected to one another by engagement of the plank members 14 with the detents 18 on the shelf support members 11. Thus in the case of the unit shown in Fig. 1, three end supports would first be assembled and then interconnected by six groups of plank members 14 to form the shelves 8, thus providing a unit having a base and two shelves at different heights with two adjacent shelves 8 at each height.

**[0019]** An advantageous feature of the system is that the uprights 6 are located at the ends of the assembled shelf unit and do not project forwardly or rearwardly from the forward and rear edges of the shelves. This results in a particularly compact unit in addition to imparting rigidity and being of pleasing aesthetic appearance. The construction of the sockets 10 imparts stability to the uprights 6 engaged within them and thus serves the dual function of rigidifying the end units and forming locating members for the ends of the shelves themselves. The web members 16 and detents 18 locate the plank members against lateral movement and the resulting structure is extremely stable and sufficiently rigid to form a self-standing unit not requiring attachment to a wall or similar structure. Further rigidity is imparted by the provision of the connecting members at the lower ends of the bottom uprights and fitting of the base shelf or shelves just above the ground.

**[0020]** The two lower locating members 7 shown in Fig. 2 of the drawings are provided with shelf support members 11 projecting from opposite sides to enable shelves to be provided at both sides of the locating members. The upper locating member 7A shown in Fig. 2 incorporates only one shelf support member 11 and is intended for use at an end of the assembled unit where shelves extend from the locating member in only one direction. Normal locating members 7 may however be used at the ends if desired.

**[0021]** A particularly advantageous feature of the arrangement shown is the relatively short length of the uprights 6. Generally all the uprights will be of the same length which corresponds approximately to the desired vertical spacing between adjacent shelves 8. Uprights 6 of different length may however be provided to enable different shelf spacings to be employed although the relatively short length of the uprights is important in providing versatility of assembly and enabling the components to be supplied in packs of relatively small overall size.

**[0022]** By virtue of the relatively short length of the uprights 6, it is possible to assemble a plurality of the components in a variety of different ways to produce shelf units of different overall dimensions. Thus, for example, the components used to form the unit shown in Fig. 1, could instead be arranged to provide up to six shelves vertically above one another or could produce a unit

having three sets of two shelves or three shelves above one another at one end, two central shelves and a further shelf at ground level at the other end. Systems consisting of greater numbers of components can be assembled in a considerable variety of different ways to provide shelf units adapted to different locations. As a result the system may readily be moved from one location to another in a house or the like and reassembled in a different manner adapted to the wall space available at the new location.

[0023] Components of the kind described may be sold in various combinations. The minimum kit would consist of four uprights, two locating members and one shelf member which may comprise a single component or two or more plank members of the kind shown in the drawings. Such a kit would enable the construction of only one shelf at a fixed height from the ground. A more usual basic kit might consist of twelve uprights, six locating members and three shelf members to produce a unit corresponding to one half of the unit shown in Fig. 1 of the drawings. By virtue of the nature of the components, a purchaser acquiring a basic system could subsequently acquire additional components to enable a shelf unit to be extended upwardly or to one side or to be reassembled to a different overall shape to suit an alternative location.

[0024] It should be noted also that assembly of shelf units from the components described may be effected without the use of tools. The uprights are a simple push fit in the opposite ends of the locating members and the plank members may be engaged with the detents on the shelf support members without the use of tools of any kind. Where bracing members 9 are provided the only tool required to fit them is a screwdriver.

[0025] Various modifications may be made without departing from the invention. For example while in the arrangement described the sockets into which the uprights engage are provided in interconnected pairs, separate individual sockets may be provided if desired. Interconnected sockets however contribute substantially to the rigidity of the assembled units and are preferred. Alternative means of engaging the locating members with the uprights and the shelf members with the locating members may be employed. Moreover while it is preferred that the components are made from synthetic plastics material, they may be made from other materials if desired.

[0026] Whilst endeavouring in the foregoing specification to draw attention to those features of the invention believed to be of particular importance it should be understood that the Applicant claims protection in respect of any patentable feature or combination of features hereinbefore referred to and/or shown in the drawings whether or not particular emphasis has been placed thereon.

## Claims

1. A set of components for the construction of a shelf assembly comprising at least four uprights (6) and at least one shelf member (8), **characterised by** a plurality of locating members (7) engageable with said uprights (6) and provided with locating means (18) engageable with the or each shelf member (8) to form a shelf assembly supported on the uprights, and further **characterised in that** the length of each of said uprights (6) approximates to a predetermined shelf spacing of the assembly.
2. A set of components according to claim 1 **characterised in that** it includes at least two further uprights (6) and at least one further shelf member (8), said locating members (7) being so constructed as to enable interconnection of the components to provide a shelf assembly having adjacent shelves (8) alongside or above one another as desired.
3. A set of components according to claim 1 **characterised in that** it includes four further uprights (6) and at least one further shelf member (8), said locating members (7) being so constructed as to enable interconnection of the components to provide a shelf assembly having adjacent shelves (8) alongside or above one another as desired.
4. A set of components according to claim 1 **characterised in that** it comprises a multiplicity of uprights (6) and of shelf members (8) together with locating members (7) adapted to be interconnected to form a plurality of alternative shelf assemblies having different arrangements of shelves dependent on user requirements.
5. A set of components according to any preceding claim **characterised in that** each shelf member (8) is formed from a plurality of plank members (14) adapted to be disposed in side by side relation to form the shelf member.
6. A set of components according to any preceding claim **characterised in that** said shelf members (8) or plank members (14) are formed by extrusion from synthetic plastics material and provided with internal reinforcement (15).
7. A set of components according to any preceding claim **characterised in that** each locating member (7) is adapted to engage a pair of said uprights (6) and to space same apart by a predetermined distance to form an end support for the, or one section of the, completed shelf assembly.
8. A set of components according to any preceding claim **characterised in that** said locating members

(7) define sockets (10) adapted to at least partially surround end portions of the associated uprights (6), each socket (10) being adapted to receive an upper end of one upright (6) and a lower end of another upright (6) whereby to interconnect said uprights (6) in vertical alignment with one another. 5

9. A set of components according to any preceding claim **characterised in that** said locating means (7) comprises a shelf support member (11) projecting laterally from the associated locating member and at least one detent member (18) projecting upwardly from the shelf support member (11) and engageable in a recess (17A) formed in the underside of an associated shelf member (14). 10 15

10. A set of components according to claim 9 **characterised in that** at least two detent members (18) are provided for engagement with each shelf member (14). 20

11. A shelf assembly **characterised in that** it is constructed from a set of components according to any preceding claim. 25

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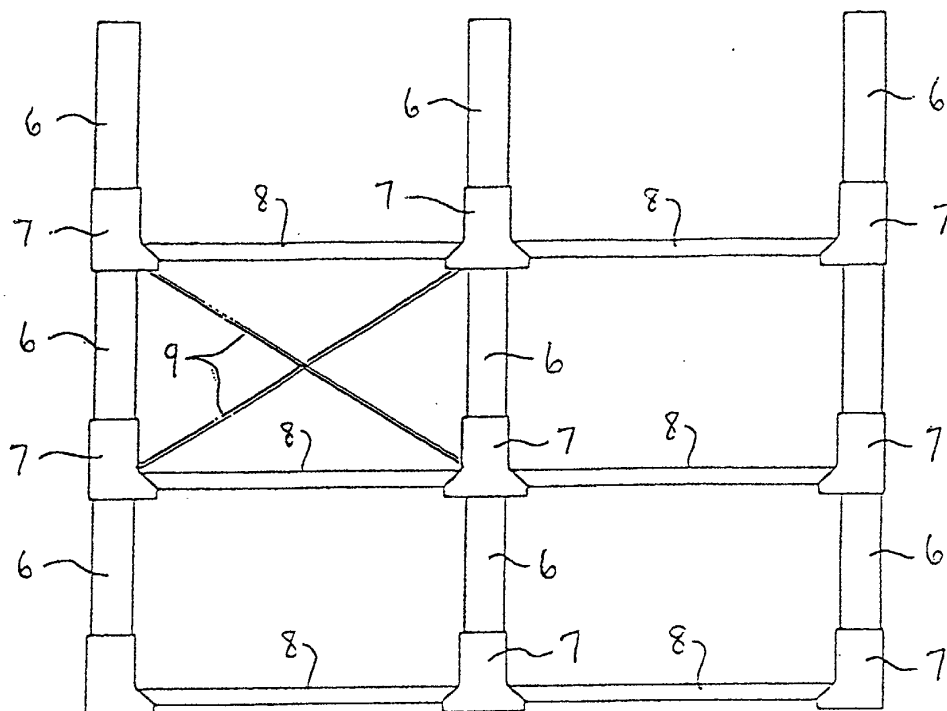
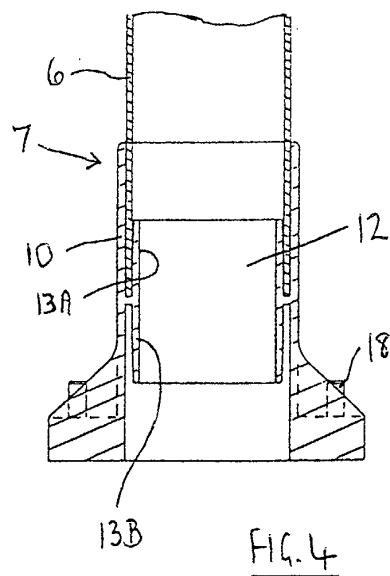
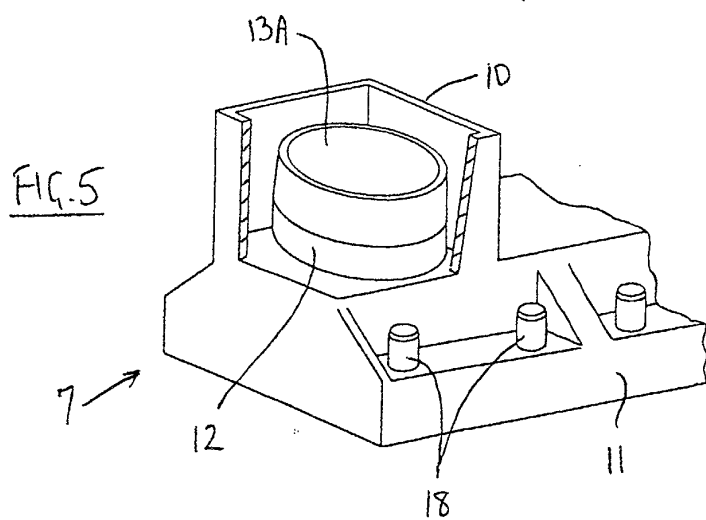
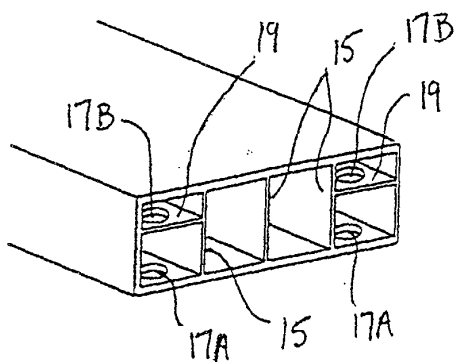
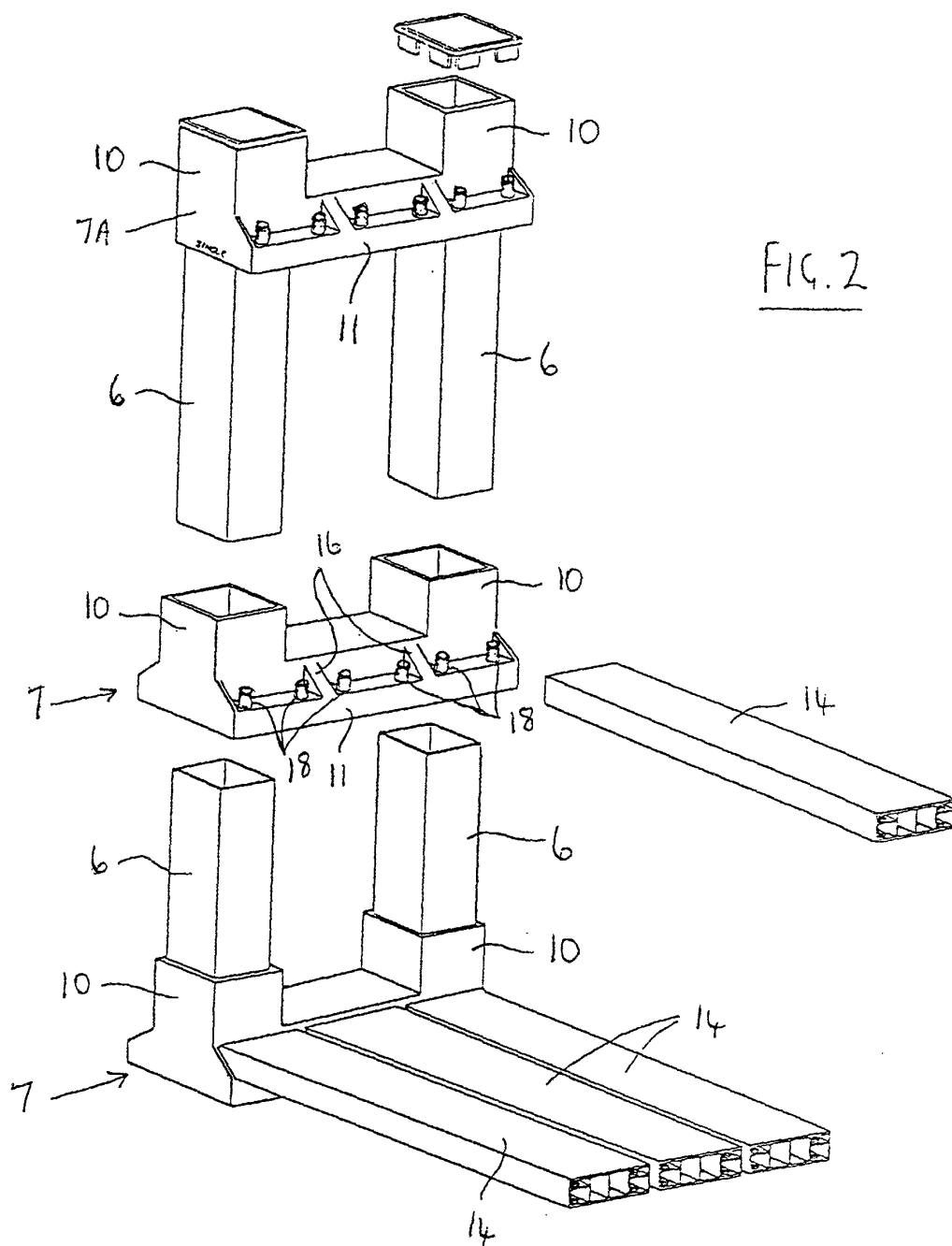


FIG. 1







European Patent  
Office

# EUROPEAN SEARCH REPORT

Application Number  
EP 01 31 0179

| DOCUMENTS CONSIDERED TO BE RELEVANT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                           |                                                          |                                              |
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| Category                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Citation of document with indication, where appropriate, of relevant passages                                                             | Relevant to claim                                        | CLASSIFICATION OF THE APPLICATION (Int.Cl.7) |
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|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                           |                                                          | A47B                                         |
| The present search report has been drawn up for all claims                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                           |                                                          |                                              |
| Place of search<br><b>THE HAGUE</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                           | Date of completion of the search<br><b>15 March 2002</b> | Examiner<br><b>Jones, C</b>                  |
| <p>CATEGORY OF CITED DOCUMENTS</p> <p>X : particularly relevant if taken alone<br/>Y : particularly relevant if combined with another document of the same category<br/>A : technological background<br/>O : non-written disclosure<br/>P : intermediate document</p> <p>T : theory or principle underlying the invention<br/>E : earlier patent document, but published on, or after the filing date<br/>D : document cited in the application<br/>L : document cited for other reasons<br/>&amp; : member of the same patent family, corresponding document</p> |                                                                                                                                           |                                                          |                                              |

EPO FORM 1503 03/82 (P4C01)



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

EP 01 31 0179

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  
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15-03-2002

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