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(54) Ouick-on shelf support for furniture and the like

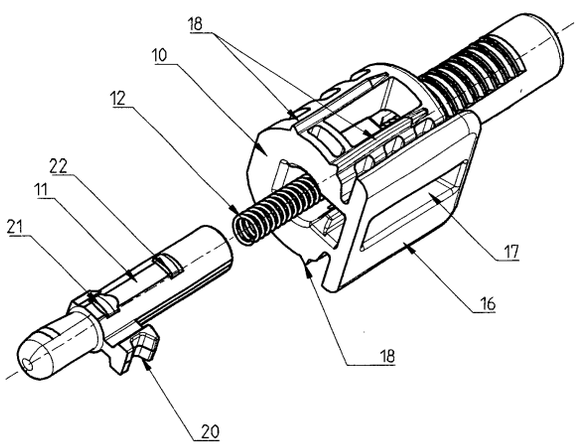
(57) Support device that, when inserted in a shelf, enables the latter to be inserted in and secured to the walls of a furniture piece such as a cabinet or the like, in a rapid and automatic manner.

The device comprises a case (10) that is inserted in the border of the shelf (13) and that holds a pin (11) loaded by a spring (12).

The pin (11) is provided with two pairs of relieves (21, 22) which are adapted to cooperate with elastic tangs (23) projecting into the case.

The pin (11) can take two stable positions, ie. a position in which it is fully inserted in the case (10) and a position in which it protrudes to enable the shelf to be joined to the wall of the cabinet. Moreover, the pin is adapted to take an intermediate unstable position between said two stable ones.

FIG. 1



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Description

[0001] The present invention refers to a support device that, when inserted in a shelf, enables the latter to be positioned in and secured to the walls of a furniture piece such as a cabinet or the like, in a rapid and automatic manner.

[0002] The shelves for furniture pieces such as cabinets, racks, bookcases and the like, are normally inserted and secured between the vertical walls thereof with the aid of various means, such as brackets, pins, studs, screws and the like. These generally known securing means consist of elements that are normally separated from the shelf itself and must therefore be mounted and fastened thereto under utilization of appropriate tools. This of course requires a number of particular operations to be carried out, which, however simple as they may also be, are not necessarily so quick and convenient to perform, since they require various parts, even quite minute ones, to be handled and various tools to be used.

[0003] In view of doing away with the drawbacks of the above described prior-art devices, a device has been proposed, which is inserted in the borders of the shelf, and which substantially consists of an elastic peg that is capable of engaging a corresponding receptacle provided in the wall of the cabinet. The peg, when in resting conditions, is protruding from the device owing to the axial thrust of the spring associated thereto. When the shelf is then inserted in the cabinet, the peg moves into interference with the wall of the cabinet and is pushed into entering in its seat against the force of the spring. When the peg ultimately comes to lie in front of the appropriate receptacle provided in the wall of the cabinet, the spring forces the peg to move outwards, thereby causing it to engage the same receptacle.

[0004] However, such a solution has a drawback in that it requires at least two bores to be drilled in the shelf in directions that are orthogonal to each other, ie. a bore intended to create the axial seat of the peg, with the related case, and a bore provided to allow for a tool to be inserted in view of causing the peg to retract when a need arises for the shelf to be released and removed from the wall of the cabinet. As a result, devices of this kind turn out to be rather complicated to install and awkward to use.

[0005] More recently, this same Applicant has filed in Italy a utility model application (no. PN2000 U 000017) covering a support device, adapted to be applied on to the side border of a shelf, which actually eliminates the drawbacks connected with prior-art devices. This device comprises a case that is inserted in the border of the shelf and contains an elastic peg, which is normally protruding from said border of the shelf and is adapted to move back into its case when the shelf is brought into interference with the wall of the cabinet. The device is characterized in that the case holding the elastic peg is provided with an open front portion, in which the peg is inserted and connected by a kind of slot-and-pin coupling, and a closed rear portion that has a smaller cross-section area than the front portion and accommodates the spring.

[0006] This technical solution is quite convenient and operable, but is actually applicable only in the case of shelves having an adequate thickness, eg. larger than 16 mm, since elastic pegs cannot have any smaller diameter than a given value, eg. 5 mm, if they are to ensure the required stability and strength.

[0007] It therefore is a purpose of the present invention to provide a quick-on support device for rapid-insertion shelves in cabinets and similar furniture pieces, which is sized to smaller dimensions than the afore described device, so as to give it a more compact overall structure and reduce joining, ie. mating allowances in general, while at the same time increasing the robustness of the device itself. The device according to this new solution can therefore be used also in conjunction with shelves having a reduced thickness, since the spring-loaded, ie elastic pin may also have a smaller diameter and, as a result, require a correspondingly smaller bore to be drilled in the shelf. In view of reaching such a result, modifications have also been introduced both in the shape of the case, in which the elastic pin is accommodated, and the retaining system used for the same pin, in accordance with the characteristics that are more closely defined in the appended claims.

[0008] Features and advantages of the present invention will anyway be more readily understood from the description that is given below by way of non-limiting example with reference to the accompanying drawings, in which:

- Figure 1 is a perspective exploded view of the support device according to the present invention;
- Figures 2A, 2B, 2C are longitudinal cross-sectional views of the support device of Figure 1, in three different operating states thereof;
- Figures 3A, 3B, 3C are views of the support device in the same operating states thereof as illustrated in Figures 2A-2C, however in longitudinal sections thereof that are orthogonal to the ones illustrated in these last-mentioned illustrations;
- Figure 4 is an enlarged front view of the support device according to the present invention.

[0009] The following description refers to the connection of a shelf to the wall of a cabinet, as this has already been described in the previous utility-model application no. PN2000 U 000017.

[0010] As this is shown in Figure 1, the support device according to the present invention comprises a correspondingly shaped case 10, which is normally made of plastic material, and inside which there is mounted a

metal pin 11 that is biased, ie. loaded by a compression spring 12, equally of metal. The case 10 is inserted in the thickness of a shelf 13 (Figures 2, 3 and 4) with the front surface thereof lying flush with the border of the same shelf. The pin 11 is adapted to take three different operating positions, in which the first one (Figures 2A and 3A) corresponds to the pin 11 being inserted in a receptacle 14 provided in a wall 15 of the cabinet, the second one (Figures 2B and 3B) corresponds to a transitory condition of said pin 11 being released, ie. disengaged from the receptacle 14 in said wall 15, and the third one (Figures 2C and 3C) corresponds to the condition in which the pin 11 is kept in a stable manner inside the case 10.

[0011] The case 10 (Figures 1 and 4) has a body featuring a front portion having a cross-sectional size that is greater than the corresponding size of the rear portion thereof. The front portion is formed to include a flat base-plate 16 provided with a longitudinal slot 17 and a plurality of longitudinal ribs 18, to the purpose of enabling the same case 10 to be firmly secured in a stable position inside the shelf 13. The base-plate 16 is further provided with a longitudinal bevel 19 (see in particular Figure 4), which is provided in a position that is diametrically opposed to the one of the base-plate or flat portion 16, in view of creating a strain-relief aimed at reducing the pressure exerted onto the shelf 13 when the latter is loaded.

[0012] The case 10 is provided with a substantially constant-diameter bore extending longitudinally therethrough. In the front portion of the case there is inserted the pin 11, whereas in the rear portion there is inserted the spring 12. In a preferred manner, the pin 11 is bored axially so as to be able to accommodate and guide the front end portion of the spring 12 (Figures 2 and 3), which therefore is actually housed between the inner extremity of the case 10 and the corresponding extremity of the bore of the pin 11.

[0013] The pin 11 is further provided with a concave tooth 20 and must be mounted inside the case 10 in such a manner as to enable this tooth 20 to lie facing the slot 17. The purpose of such a tooth 20 is in fact to enable the pin 11 to be operated with the aid of an appropriate tool (eg. a screwdriver), so as to cause it to slide within the case 10, when a need arises for the shelf 13 to be released from the wall 15. In this connection, the pin 11 is provided with a couple of pairs of mutually opposing relieves 21, 22 (Figures 3A-3C) that are adapted to cooperate with two diametrically opposed elastic tangs 23 extending inwards in an axial direction from the front edge of the case 10.

[0014] Normally, the pin 11 is loaded, ie. biased by the spring 12 to extend out of the case 10 (Figures 2A and 3A) in a locked position defined by the tangs 23 engaging, ie. abutting against the relieves 22. Such an abutment constitutes a positive and reliable stop contrivance in view of limiting the extent to which the pin is capable of sliding out of the case. It should in fact be noticed that the relieves 22 have such a right-angled sectional profile as to prove effective in providing a retaining means for the pin 11 to be retained against the tangs 23. On the contrary, the relieves 21 protrude from the body of the pin 11 to a lesser extent than the relieves 22 and have a sectional profile showing a plane with a reduced inclination so as to constitute an unstable abuttal for the free ends of the tangs 23.

[0015] When the shelf 13 has to be attached to the wall 15 of the cabinet, it is sufficient for the border of the shelf to be brought into interference with the surface of the wall, so that the pin 11 is pushed into the case against the action of the spring 12, until the relieves 21 ultimately reach the free ends of the tangs 23 (Figures 2B and 3B). In this position, the pin 11 finds itself in a loose condition. As a result, when the pin 11 comes to lie in front of the respective receptacle 14 in the wall 15, the spring 12 pushes the same pin into said receptacle, in the stable attachment position illustrated in Figures 2A and 3A.

[0016] For the shelf to be removed, use must be made of a tool in order to act with it on the concave tooth 20 so as to cause the pin 11 to slide back into the case 10 against the action of the spring 12, until the relieves 21 are brought into engagement with the elastic tangs 23 (Figures 2C and 3C). The pin 11 is at this point fully released from the respective receptacle 14 and the shelf 13 can so be removed. Then, by acting again on the concave tooth 20 with the tool, the pin 11 can be caused to slide again into its extracted position, ie. the position in which it protrudes from the case 10, so that it is ready for being re-inserted in a respective receptacle 14.

[0017] The aim of the present invention is therefore reached through the use of a pin 11 and a spring 12, both of them made of metal, which enable the respective diameters to be reduced, while however increasing their strength. In addition, the simplification in the shape of the pin 11 and the modification of the retaining system thereof allow for the overall size of the whole device to be reduced along with the mating or coupling allowances. Furthermore, the compactness of the case 10 makes the device adaptable also to shelves having a reduced thickness (eg. 16 mm), while anyway complying with the requirements of the applicable standard regulations.

Claims

1. Support device for application to the side border of a shelf in order to enable the latter to be positioned in and secured to the walls of a furniture piece, such as a cabinet or the like, in a rapid and automatic manner, comprising a case (10) that is inserted in the border of the shelf (13) and contains an elastic pin (11, 12) that normally protrudes from the border of the shelf and is adapted to slide back into said case thereof when the shelf is brought into interference with the surface of a wall (15) of the cabinet,

characterized in that the pin (11) is provided with two pairs of relieves (21, 22) that are adapted to cooperate with elastic tangs (23) extending into the case (10), in which a first such pair of relieves (21) constitute an unstable engagement for the free ends of the tangs (23), whereas the second pair of relieves (22) constitute an abutment to limit the extent to which the pin (11) is allowed to extend out of the case (10).

2. Support device according to claim 1, **characterized in that** said second pair of relieves (22) have a right-angled sectional profile, whereas said first pair of relieves (21) protrude from the body of the pin (11) to a lesser extent than the relieves (22) and have a longitudinal-section profile showing a plane with a reduced inclination.

3. Support device according to claim 1 or 2, **characterized in that** the pin (11) is provided with a concave tooth (20) adapted to be actuated, through a slot (17) provided in the body of the case (10), by means of a tool in view of causing the same pin to retract into the case and enabling the shelf (13) to be so released from the wall (14) of the cabinet.

4. Support device according to claim 3, **characterized in that** the slot (17) is provided in a flat base-plate (16) of the case (10) constituting a support element for the whole device.

5. Support device according to any of the preceding claims, **characterized in that** the pin (11) is perforated axially and the spring (12) is housed between the inner extremity of the case (10) and the inner extremity of said axial bore of the pin (11).

FIG. 1

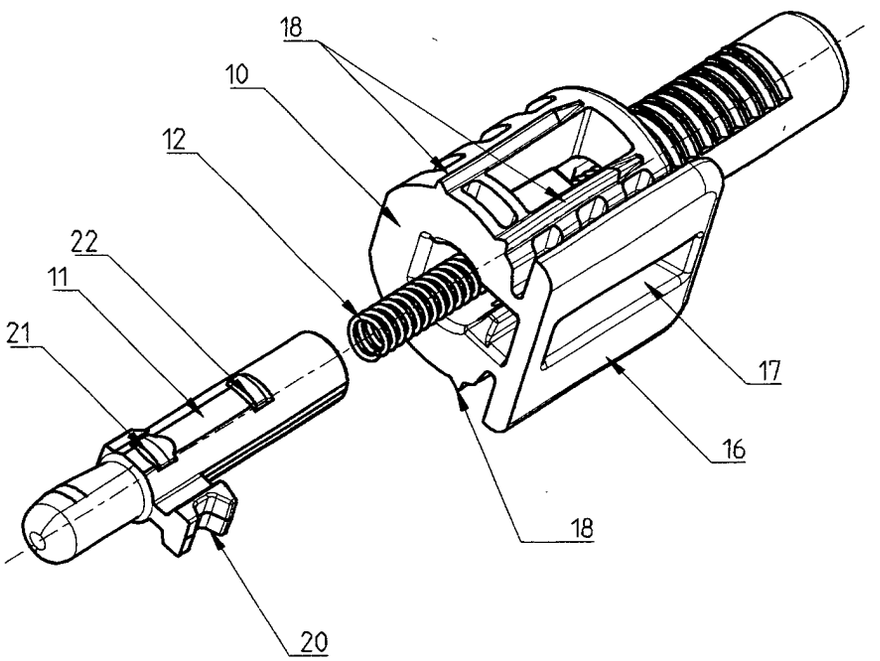


FIG. 2A

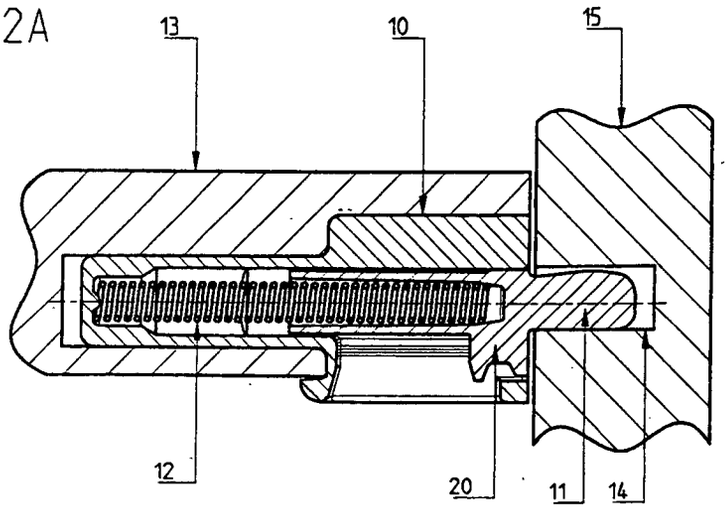


FIG. 2B

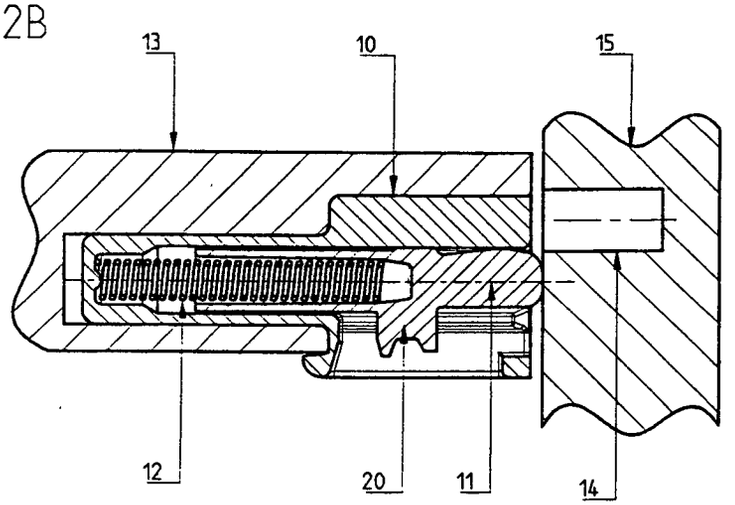


FIG. 2C

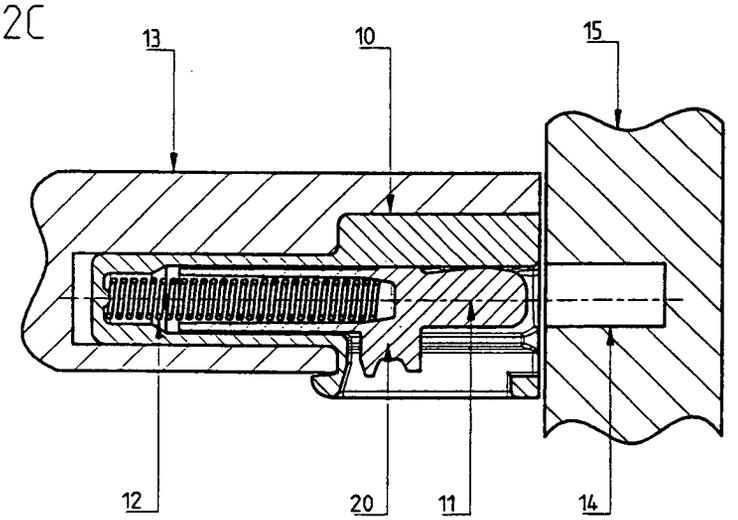


FIG. 3A

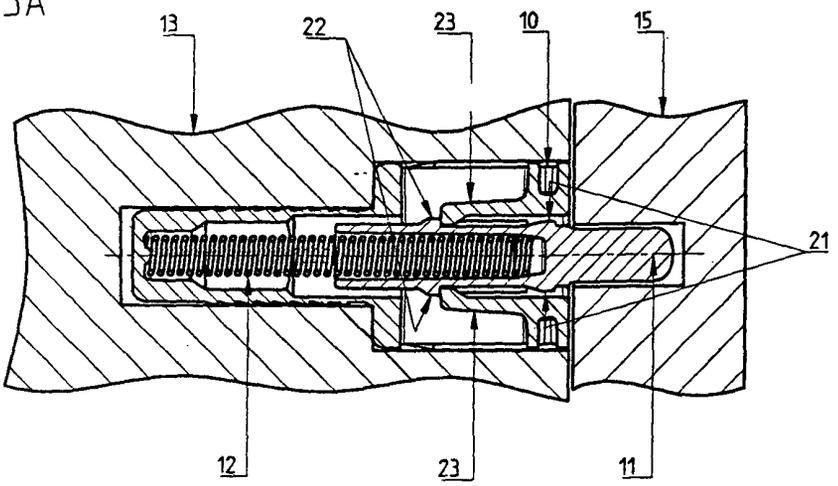


FIG. 3B

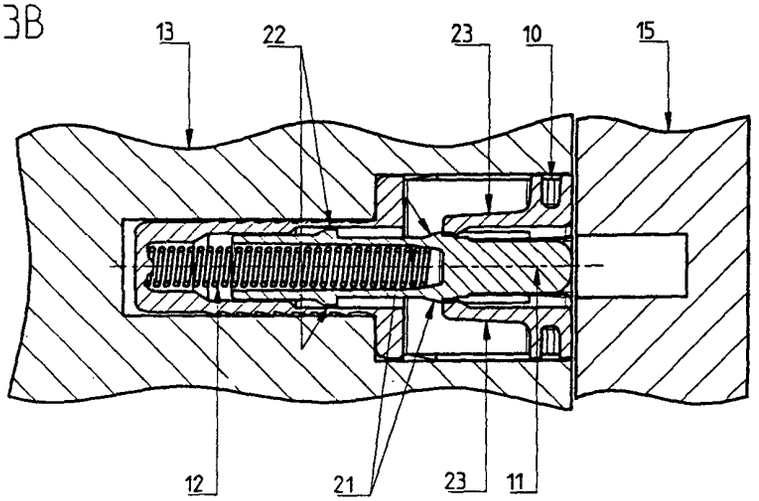


FIG. 3C

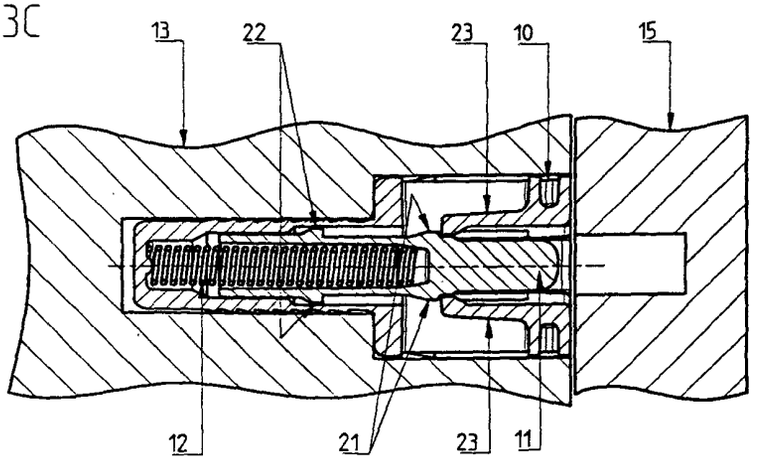
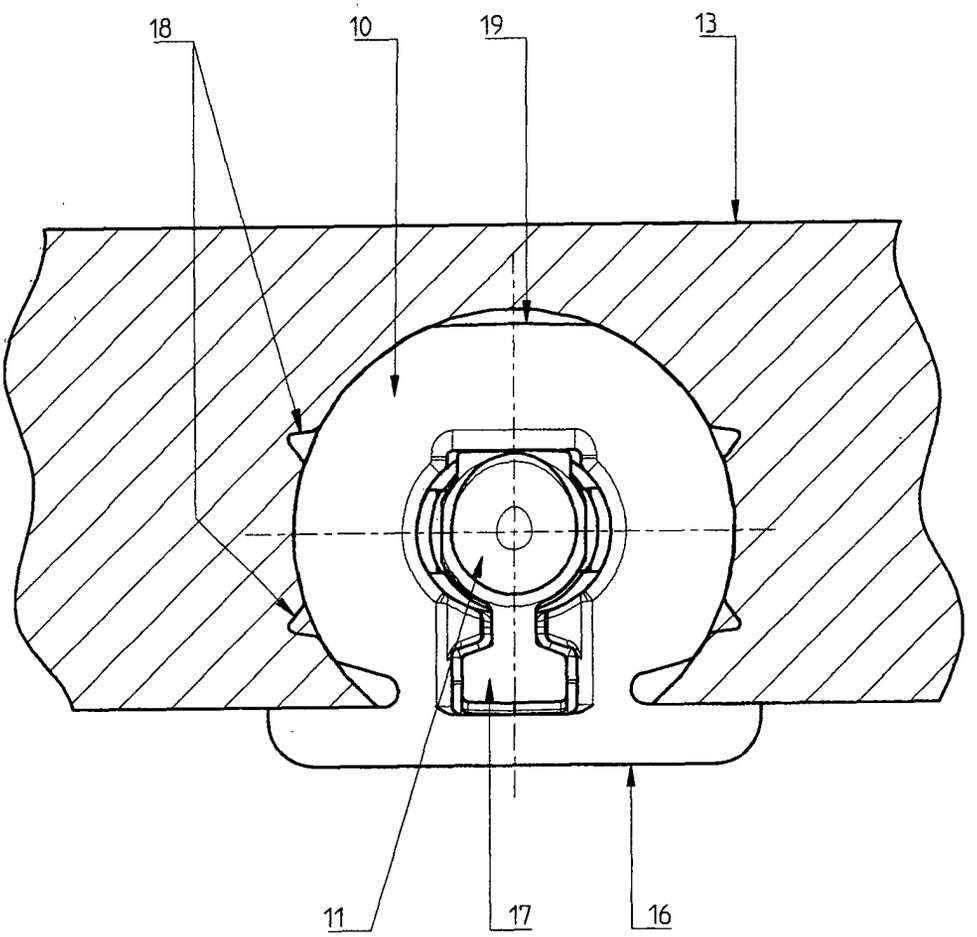


FIG. 4



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EUROPEAN SEARCH REPORT

Application Number
EP 02 00 0992

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)
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A	US 3 750 238 A (TANNER R) 7 August 1973 (1973-08-07) * column 1, line 60 - column 2, line 24; figures 1-9 * * column 2, line 49 - column 3, line 6 *	1	
A	FR 2 040 601 A (DARIOSECQ) 22 January 1971 (1971-01-22) * claims 1-4; figure 1 *	1	
A	FR 2 655 527 A (RIDDER JEAN BAPTISTE DE ;AUMAITRE HUBERT (FR)) 14 June 1991 (1991-06-14) * abstract; figure 1 *	1	

TECHNICAL FIELDS SEARCHED (Int.Cl.7)

A47B
F16B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	15 May 2002	Jones, C

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15-05-2002

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