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(54) **SEAT**

(57) It is a seat that basically consists of a structural cover that is split into compartments that, in the specific case of a sofa, has different cavities for the backrest, seat, armrest and other parts of the sofa, in such a way that bags filled with a lightweight material can be fitted into and adjusted inside these cavities, so that these bags are really the elements that serve to reinforce the sofa as a whole, thus obtaining a low-cost and lightweight product that is easy to transport because of its slight volume as a result of it being possible to dismantle it before transporting it, which sets it apart from most conventional sofas, which have to be moved in their completely assembled form.

The bags can be composed of a single compartment or several, in which case each compartment may in turn be filled with different materials in order to obtain different degrees of flexibility.

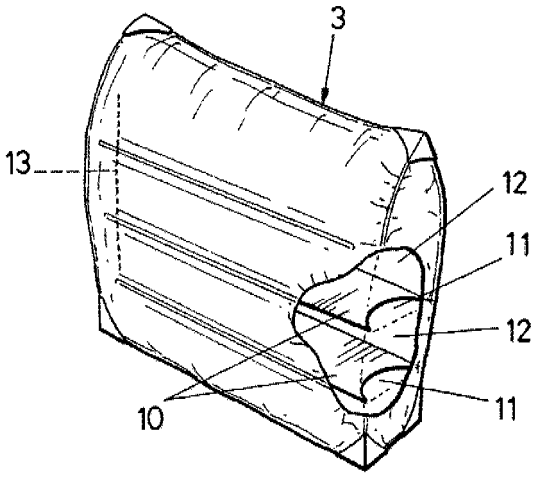


FIG.5

EP 1 992 256 A1

## Description

### OBJECT OF THE INVENTION

**[0001]** As is described in this report, this invention is a seat whose distinctive feature is that there is no internal rigid structure to serve as a support for the seat, although this in no way detracts from the required convenience and comfort of the piece of furniture in question.

**[0002]** Furthermore, it performs the same functions and has the same characteristics as a conventional seat with a rigid structure and support, albeit with the advantage of its being a lightweight seat that is also cheaper and more ecologically friendly than conventional seats.

**[0003]** It must also be pointed out that it is easy and cheap to move it from one place to another because of its volume and weight, as it can be dismantled for transportation purposes.

### BACKGROUND TO THE INVENTION

**[0004]** In a preferred practical embodiment of the invention, that is to say applied to sofas and other items of furniture of a similar nature, the conventional technique consists of establishing an internal structure that is rigid, generally made of wood, upon which the different parts and elements with a softening effect are assembled with a view to achieving the desired level of comfort.

**[0005]** The aforementioned types of seat are costly to produce, because of their complex structural nature, and they are also voluminous and heavy, which has a negative effect when it comes to storing or transporting them.

**[0006]** Other seats that do not have an internal structure have been developed in an attempt to get around the aforementioned problem, such as the one that is described in Spanish Utility Model 154.644, which consists of an inflatable armchair that comprises a slid assembly that is made up of several hollow bodies that are filled up with air under pressure.

**[0007]** It is clear that when a seat of this type is not inflated, it hardly takes up any room and it weighs very little, which overcomes the above-mentioned problems such as storage and transport. However, the basic problem that affects these pneumatic seats revolves around the fact that they are unstable and become easily misshapen, which means that they can only be used as very small armchairs.

**[0008]** European patent 0 284 294 is a chair for geriatrics consisting of water bags, which can logically be stored and transported easily when the bags are empty and they weigh very little, but this is not the case with their volume, because a fixed structure is required to support the bags, and it must also be pointed out that the deformability of the bags is excessive and that even though the chair might be suitable for solving the problems that are faced by certain senior citizens, this does not apply when it comes to a conventional seat.

**[0009]** Patent GB 1.300.733. is a cushion with one single conventional chamber that can be stuffed with fillings of different kinds, to afford different degrees of hardness, but it is clear that this cushion solution cannot be applied directly to a sofa, for example, where there have to be self-supporting elements that limit its deformability, especially where armrests and the backrest are concerned.

**[0010]** A mattress has also been developed bearing US Patent 4843666, based on a receptacle into which a variety of pads of different hardness are inserted, so that the hardness throughout the entire mattress is ideally suited to the different parts of the body that will be lying on them, yet the functionality of this mattress lies in the fact that it is supported on a flat and rigid surface, so that if this technology were to be applied to a sofa, it would have to be arranged in a rigid structure, which as has already been pointed out is undesirable because of its weight and volume, among other negative factors.

**[0011]** Patent WO 9602402 describes a seat that has a rigid frame, referenced as (12)-(13), upon which two superimposed compartments are mounted that are filled with fluid. This solution is along the structural lines of European Patent 0 284 294, so the same considerations made about the latter are valid.

**[0012]** The applicant is unaware of any of the seats of the aforementioned types, which lack a rigid structure and that are nevertheless sufficiently substantial to conserve their essential shape, with deformations that are similar to those that affect pieces of furniture with rigid structures, without this detracting from maximum comfort where the users are concerned.

### DESCRIPTION OF THE INVENTION

**[0013]** The seat that is the object of the invention is mainly characterised by the fact that it is equipped with a series of bags filled with a softening material with different degrees of hardness and density, for example of the perlite or granulated type, although any other product might be suitable. Grains of the lightest types of material are normally used that are easy to fill by pneumatic means, such as polymers, polypropylene, polystyrene, polyethylene, etc.

**[0014]** Each one of these bags containing the filler material forms part of the seat, in such a way that a sofa might have, for example, one bag for each armrest, another one for the backrest, another one for the horizontal part of the seat, etc, with the same density or different densities.

**[0015]** In accordance with the essence of the invention, the aim of the above-mentioned bags is to fill up what could be referred to as the structure of the sofa or seat in question, consisting of a flexible cover that is split into compartments, preferably made of a textile or something similar, which on the one hand coincides in form and size with the perimeter of the piece of furniture, and that on the other hand is equipped with inner partitions of the same type, which not only make the structure of the cover rigid, but also serve as a housing for the aforementioned

different bags or groups of bags, and each one of the compartments has at least one intake equipped with means for closure, such as a zip, for example. It is thus possible to achieve a compact assembly by totally occupying the aforementioned compartments with the bags concerned, which serves to keep the shape of the sofa or piece of furniture in question perfectly stable, not only when empty but also when in use, apart from the slight and specific deformations in the zones where the body is resting, similar to the small deformations, albeit temporary, to which a conventional sofa is subjected, because the piece of furniture returns to its original shape as soon as it is unoccupied.

**[0016]** Normally, each segmented space will have an intake so that the bags inside can be adjusted, although it is also possible that several segmented spaces might have one single intake when the individual space in question is larger.

**[0017]** Another major characteristic of the invention is that each one of the bags has a substructure composed of intermediate partitions that separate different compartments, and give the bag its rigid nature, these partitions being provided with passages that connect up with the adjacent compartments, so that the filling process for these compartments takes place as swiftly and, above all, as correctly as possible, without there being any risk of hollows or empty spaces.

**[0018]** In another embodiment, there could be bag compartments that are independent, so that they can be filled with different materials and thus different densities, thereby obtaining different degrees of hardness that can be adapted to the ergonomics of the seat and, all in all, greater comfort for the user. Where this embodiment is concerned, it is only to be expected that each compartment has its own intake, although it would also be possible for there to be one single communal intake, as long as one of the ends of the compartments leads to this communal intake.

**[0019]** In another embodiment of the structure for the bags with special shapes and/or when they lack the required rigidity, it has been planned to incorporate independent rigid structures that will evidently be inserted through intakes in the bags so that they can be placed in the volume that is taken up by the filling material, a sheeting element being positioned in between so that it can form part of the bag, thereby managing to increase the consistency, solidity and rigidity of the bags in a positive way, thus ensuring that the seat is likewise more consistent, solid and rigid in the zones where these bags are placed.

**[0020]** Another characteristic of the invention is that the bags are provided with reinforcements at the edges in the places where these coincide with the edges of the sofa, in such a way that this characteristic, together with the insertion of intermediate partitions, makes the seat more rigid and solid, so that it does not flatten when the user sits down on it. The reinforcements can also be placed on the corners of the bags.

**[0021]** Therefore, once all the bags have been filled, they are inserted into the covers, basically made of foam material, which eventually makes them look like a traditional armchair. Finally, an outer cover is placed over them to give them look appealing, and this cover may either be made of leather, cloth or any other textile.

**[0022]** The following are just some of the advantages of the new seat that is the object of the invention:

- The material that is used makes it cheaper.
- The seat weighs less.
- It is more convenient to handle.
- It is easier to transport.
- The in situ manufacturing methods are ecologically friendly.
- Different densities of the filling material can be used, depending on the zone to be filled.
- It is easy to store the seat without the filling.
- It is easy to fill the seat in the shop itself.
- It makes it easy to design the seat using only flexible materials (textiles, canvas, foam, etc) that do not determine its shape, in contrast to the conventional rigid structures that are normally used.

**[0023]** The bags are normally made of textile materials and even those that are mentioned above, although it is also possible to manufacture the bags heat-sealable material, the different parts being joined together by heat-sealing, as well as the intakes. Even when this heat-sealable material is impermeable, it will contain micro-perforations to enable the release of air while the bags are being filled, thereby preventing vacuums from forming and defects appearing in them.

**[0024]** In order to aid a better understanding of the characteristics of the invention, a set of drawings is accompanied as an integral part of this description where for purposes of illustration and in a non-limiting manner the following is represented.

## BRIEF DESCRIPTION OF THE DRAWINGS

**[0025]**

Figure 1.- This drawing shows a perspective view of the seat that is the object of the invention. It basically consists of a cover that is split into compartments and some bags with a filling material that adapt to the shape of the compartments inside the cover.

Figure 2.- This drawing shows a perspective view of the lower surface of the structural cover split into compartments that basically shows some open compartment spaces prepared to fit the respective bags with their filling.

Figure 3.- This drawing shows a perspective view of a bag with the filling material, highlighting the reinforcements for the edges and corners.

Figure 4.- This drawing shows a section view of the seat assembly clearly showing details of the different parts that form the seat, the parts in question in this case being for a sofa.

Figure 5.- This drawing shows a perspective view of a bag split into compartments.

Figure 6.- This drawing shows a perspective view of a bag split into compartments with a structure that is different from the one shown in the preceding figure.

Figure 7.- This drawing shows a perspective view of a bag into which a rigid piece could be inserted to make the bag more solid and give it more substance.

Figure 8.- This drawing shows a perspective view of a section of a bag with the rigid part incorporated.

## DESCRIPTION OF A PREFERRED EMBODIMENT OF THE INVENTION

**[0026]** Considering the numbering that is used in the figures, the seat is initially composed of at least one flexible foam cover (1) that is split into compartments where several open cavities are defined (2) in which the respective bags (3) are adapted with a filling material (4), made of perlite or other granulated materials, in such a way that as soon as these bags (3) are inserted and adjusted within the cavities (4), they are closed, thus forming and strengthening the seat assembly.

**[0027]** These cavities (2) are separated from each other by partitions that are inserted between them (5), which form part of the cover (1).

**[0028]** The edges of the bags, and even the corners, are equipped with reinforcements (6) and (7) in order give the seat assembly a better shape.

**[0029]** Furthermore, cover (1) may also be provided with reinforcements (8) and (9) at the edges and, above all, at the corners.

**[0030]** Each one of the bags (3) constitutes a part of the seat, in such a way that in the specific case of a sofa, we have one bag (3) for each armrest, one for the sofa backrest and another one for the seat, etc.

**[0031]** The sofa will be covered with an outer decorative cover (15) that can be made of a wide variety of materials.

**[0032]** The bags can also be made to contain one single compartment containing a filling material, such as can be seen in Figure 3, although the bags can also be given different layouts and structures, such as those shown in Figures 5 to 8.

**[0033]** Therefore, the bag (3) can have an internal substructure that is composed of internal partitions (10) that separate different compartments (12), partitions that are provided with intakes (11) between the compartments so that the process of filling these compartments can be both as rapid and correct as possible, making sure that there are no vacuums created or empty spaces left, as well as guaranteeing that there are no variations in the density of a volume occupied by the same type of filling material (4).

**[0034]** In another embodiment it is envisaged that the compartments (12') in the bags (3) be independent so that they can be filled up with different materials, that thus have different densities, thereby making sure that the hardness can be different and adapted to the ergonomics of the seat and, all in all, make it more comfortable to sit in. In this embodiment, it is most often the case that each compartment (12) has its own intake (13), although it would also be possible to have one single communal intake, as long as one of the ends of the compartments (12) leads to this communal intake (13).

**[0035]** In another embodiment of the structure for the bags (3) with special shapes and/or when they lack the required rigidity, it has been planned to incorporate independent rigid structures (14) that will evidently be inserted through the intakes (13) in the bags (3) so that they can be placed in the volume that is taken up by the filling material (4), with the possibility of inserting a sheeting element (16) attached to the encapsulating material surronding the bag (3), so that this element can form part of the bag (3), thereby increasing the consistency, solidity and rigidity of the bags (3) in a positive way, thus ensuring that the seat is likewise more consistent, solid and rigid in the zones where these bags (3) are placed.

**[0036]** The cavities (2) in the flexible structural cover (1) can optionally accommodate blocks or pieces (17) of material that is elastomeric or similar, instead of the aforementioned bags (3), in order to modify the hardness, comfort of the seat, etc.

**[0037]** As has already been pointed out, the construction described manages to cut down greatly on the cost, volume and weight, in such a way that in the specific case of a sofa, when a traditional sofa with a wooden frame is compared to the one that is the object of the invention, the following results are obtained:

- Approximately twenty-one different raw materials are used to make a traditional sofa, whereas only about seven are used to make a sofa in accordance with the invention, which means that the cost of raw materials used in the latter is approximately 36% less.

- A conventional sofa requires a construction process that involves sixteen operating phases, whereas only eight phases are involved in making a sofa in accordance with the invention, and all of these phases can be automated.

- The volume taken up (before filling) is roughly 95.7% less for sofas that are eventually the same size, while at the same time the reduction in weight is approximately 77% (after filling), with the obvious advantag-

es where storing and transporting are concerned, plus the fact that access to many homes is difficult, which is no longer a problem with the piece of furniture that is the object of invention, because it is easy to dismantle.

**[0038]** All of this leads to optimum ergonomics and an almost limitless design potential.

## Claims

1. A seat, such as a sofa or similar, of the type that contains light filling material in the form of granules contained in bags in a similar way to cushions with different layouts, **characterised by** the fact that it contains an outer cover (1) as a structural element, which is flexible in nature, preferably made of textile material or similar, provided with inner partitions (5) that help to enhance the structural function and serve to form several compartments (2) inside the piece of furniture, each of which is provided with intakes, and occupied by the respective b ags (3) containing filling material, the cover and bags constituting a compact assembly that can be adjusted with means for closure that can keep the general layout of the piece of furniture stable as pressure is exerted upon it when it is being used for the purpose for which it is intended.

2. A seat, as in Claim 1, **characterised by** the fact that each bag (3) has at least one compartment, which contains the filling material (4), which can be perlite, polymers, polypropylene, polystyrene, polyethylene or similar materials.

3. A seat, as in Claim 2, **characterised by** the fact that the bags (3) have an internal substructure composed of internal partitions (10) that separate different compartments (12) occupied by the filling material (4).

4. A seat, as in Claim 3, **characterised by** the fact that the internal substructure of the bags (3) has intakes (11) incorporated into the internal partitions (10), which serve to connect adjacent compartments (12).

5. A seat, as in Claim 3, **characterised by** the fact that the internal partitions (10) in the bags (3) create independent compartments (12') so that they can be filled with different filling materials with different densities.

6. A seat, as in any of the preceding claims, **characterised by** the fact that it has at least one rigid body (14) incorporated into the filling material (4) a sheeting element being positioned in between (16); all of this being provided with a view to making the softened bodies formed by the bags (3) solid and to giving them substance.

7. A seat, as in Claim 2, **characterised by** the fact that the bags (3) have at least one intake (13) leading into them, equipped with means for closure.

8. A seat, as in any of Claims 3 to 6, **characterised by** the fact that the bags with an internal substructure are equipped with one single communal intake (13).

9. A seat, as in Claim 5, **characterised by** the fact that the independent compartments (12') each have intakes (13).

10. A seat, as in any of the preceding claims, **characterised by** the fact that at least the external covering for bags contains a heat-sealable material; all of this is provided in order to give the bag its shape by joining up its different parts by heat-sealing and with the possibility of closing the intakes (13) also by heat-sealing.

11. A seat, as in Claim 10, **characterised by** the fact that the heat-sealable material for the bags (3) is impermeable and has micro-perforations.

12. A seat, as in any of the preceding claims, **characterised by** the fact that the cover split into compartments (1) is covered with a second outer cover (15) that is decorative.

13. A seat, as in Claim 6, **characterised by** the fact that the sheeting element (16) that covers the rigid body (14) forms an essential part of the material that encapsulates the bag (3).

14. A seat, as in Claim 6, **characterised by** the fact that the sheeting element (16) that covers the rigid body (14) has an independent body that is joined to the material that encapsulates the bag (3).

15. A seat, as in Claim 1, **characterised by** the fact that the compartments in the structural cover (1) are filled with or contain blocks or pieces (17) of material that is elastomeric or similar.

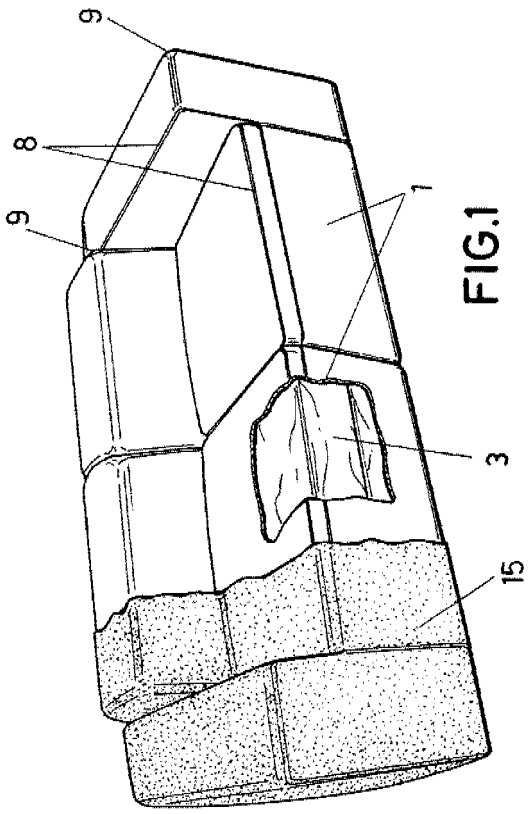


FIG.1

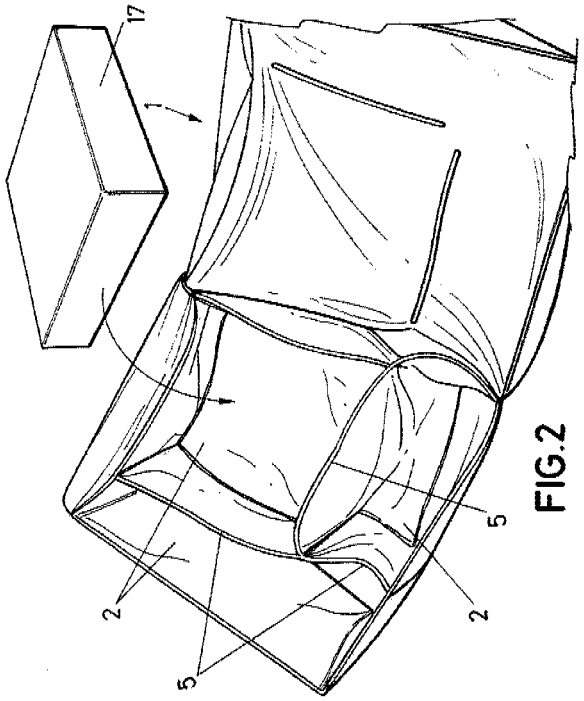


FIG.2

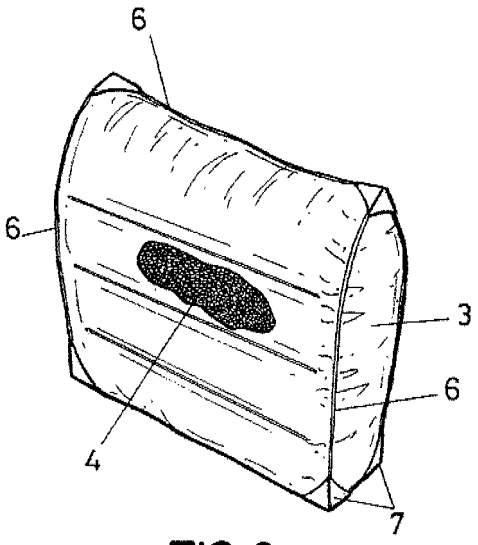


FIG.3

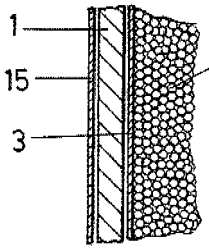


FIG.4

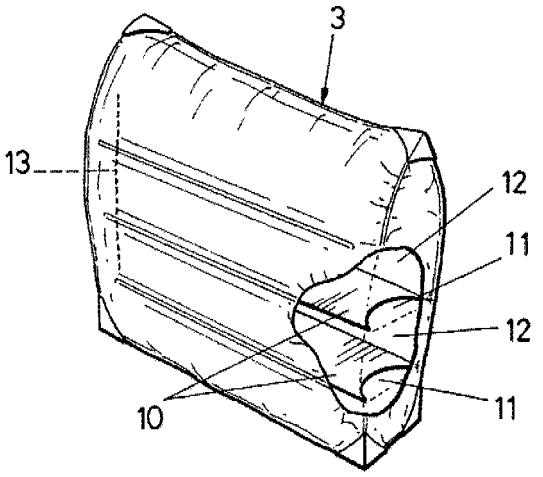


FIG.5

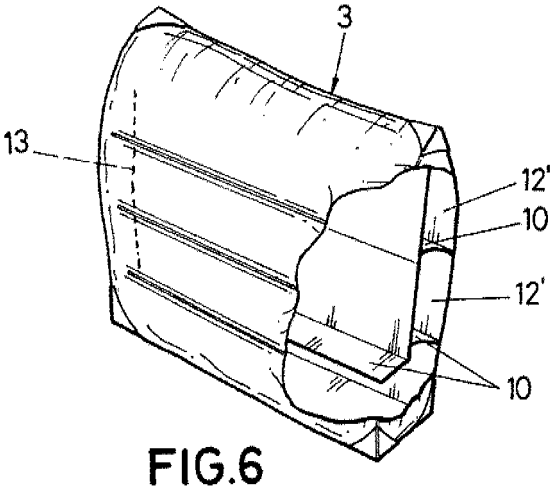


FIG.6

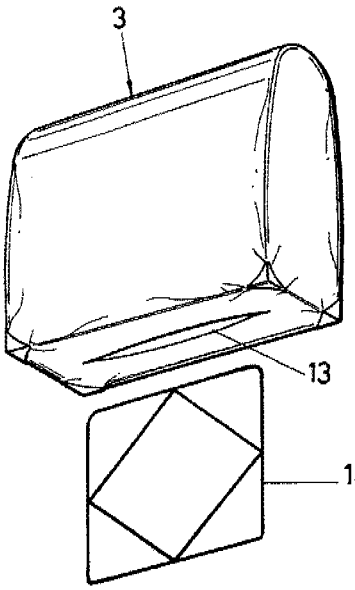


FIG.7

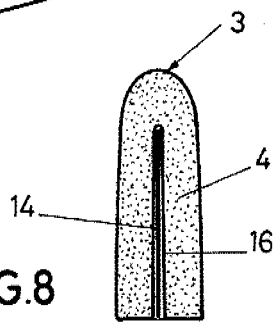


FIG.8

INTERNATIONAL SEARCH REPORT

International application No.
PCT/ ES 2007/000115

A. CLASSIFICATION OF SUBJECT MATTER

see extra sheet
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)
A47C

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 practicable, search terms used)

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C. DOCUMENTS CONSIDERED TO BE RELEVANT

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

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| Date of the actual completion of the international search | Date of mailing of the international search report |
|---|---|
| 28 May 2007 (28.05.2007) | (19/06/2007) |
| Name and mailing address of the ISA/<br>O.E.P.M.<br><br>Paseo de la Castellana, 75 28071 Madrid, España.<br>Facsimile No. 34 91 3495304 | Authorized officer<br>F. Monge Zamorano<br><br>Telephone No. +34 91 349 55 41 |

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INTERNATIONAL SEARCH REPORT

Information on patent family members

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INTERNATIONAL SEARCH REPORT

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PCT/ ES 2007/000115

CLASSIFICATION OF SUBJECT MATTER

*A47C 27/14* (2006.01)
*A47C 31/12* (2006.01)
*A47C 7/18* (2006.01)

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## REFERENCES CITED IN THE DESCRIPTION

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