(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) **EP 1 988 026 A1**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
05.11.2008 Bulletin 2008/45

(51) Int Cl.:
B65D 19/22 *(2006.01)*

(21) Application number: **07009004.8**

(22) Date of filing: **04.05.2007**

(84) Designated Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IS IT LI LT LU LV MC MT NL PL PT RO SE SI SK TR
Designated Extension States:
AL BA HR MK RS

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(54) **Plastic pallet assembly**

(57) A pallet (1) or base pad for storing and transporting goods comprises a stiffening structure (12) and plastic material surrounding the stiffening structure (12).

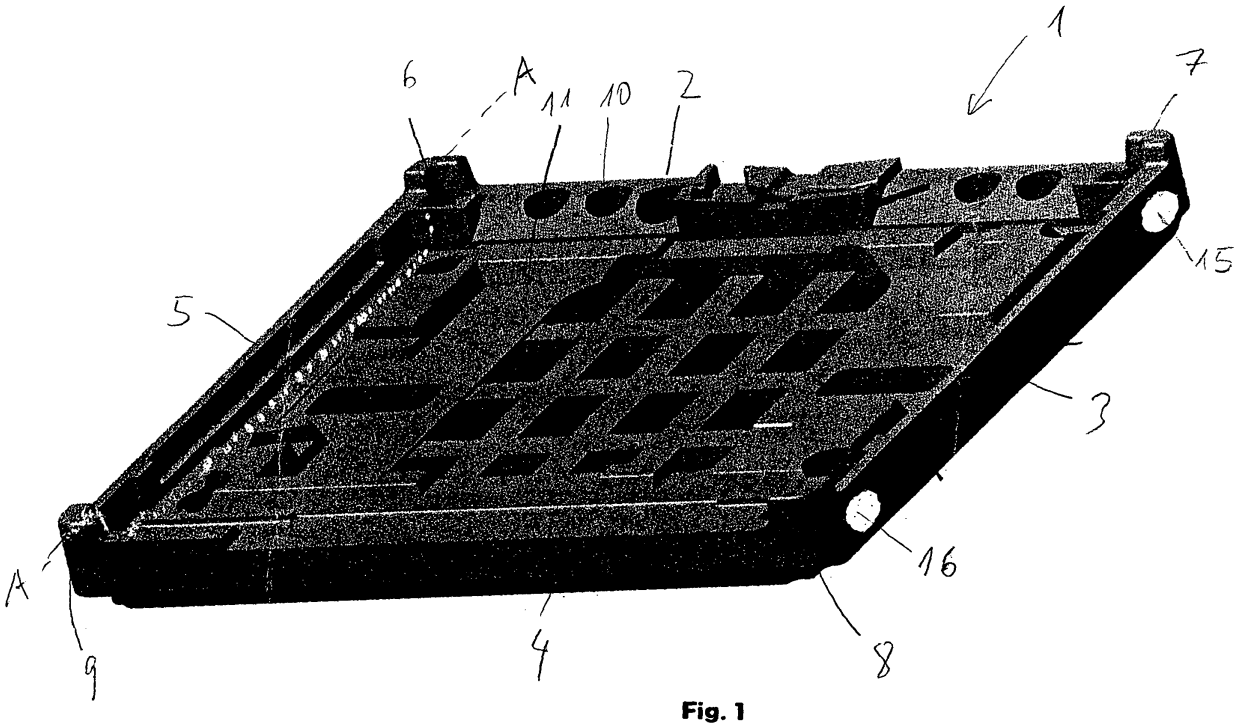


Fig. 1

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Description

Technical Field

[0001] The present invention relates to pallets for storing and transporting goods.

[0002] It is customary to transport goods and to store goods on pallets. Palletized goods are maintained in a position above the flooring which may be advantageous in areas where the flooring is either rough or of concern. Standard pallets are particularly useful in materials handling because forklift equipment can maneuver the pallets by inserting their forklift into channels provided by the pallet. Typically, pallets are constructed of wood. In the past, wooden plates have provided advantages of economy, simplicity and durability, principally because of the lack of other suitable materials. However, wooden pallets are extremely heavy and require costly hand labour in their fabrication.

Background of the Invention

[0003] In the past decades, disposable pallets have been proposed and, with the growth of plastics industry, a wide variety of plastics have been investigated to determine their suitability for use in producing pallets. Plastic pallets can easily be molded and are stronger and lighter in weight than wooden pallets; also, they can now be made with recyclable material. Furthermore, plastic pallets are more durable than wooden pallets. Recent plastic pallets that are light in weight, durable, capable of supporting heavy loads, easy to manufacture and have a minimum number of interchangeable parts are disclosed in US patents 5 343 814 or 4 843 976.

[0004] The pallets and connectors disclosed in these patents have described an effort to improve thereon, to reduce the cost and weight of the pallets and to increase strength and yet not decrease durability.

[0005] From US patent 5 197 395 a plastic pallet with a deck assembly is known that includes two identical decks that are interconnected by identical connectors. Each connector includes a central core and a surrounding sleeve interconnected by spokes. The core has flexible tangs that extend beyond opposite ends of the sleeve and lock onto the deck. Each deck includes a plurality of respective segments consisting of a pair of open shells and the periphery of each deck is reinforced by respective segments that are internally reinforced by gussets.

[0006] The frame members or decks have openings which define surrounding abutments that are recessed below the exposed surface and the connectors have flexible tangs that have barbs which engage the abutments.

[0007] Each connector consists of a hollow circular core which has slots extending from opposite ends to produce first and second sets of tangs. Spokes are integral with the peripheral surface of the core between the tangs and a sleeve is integral with the outer ends of the spokes. The sleeve has tapered portions between each pair of spokes and alternating tapered portions are reversely tapered to provide additional rigidity for the connectors. Additionally, the hollow core has a force-absorbing inner flange equally spaced from the respective tangs and has axial ribs extending from the flange aligned with a tang. Each tang has a tapered barb adjacent a free end and an aligned inner integral rib which extends to the flange so that forces transmitted to the tangs are directed towards the flange.

[0008] It is the object of the present invention to provide for a pallet which is suitable for overseas dispatch and can be reused a plurality of times.

[0009] The pallet according to the invention is characterized in that it comprises a strengthening structure and plastic material surrounding the strengthening structure.

[0010] The plastic material prevents noxious insects from nesting in the strengthening structure even if it is made of an organic material.

[0011] The pallet may be comprised of a plurality of layers (multilayer design) which are interconnected to each other chemically or mechanically.

[0012] Advantageous embodiments of the aforementioned pallet are contained in the dependent claims and in the description.

[0013] To permit a considerable support of the pallet and to provide a high load-capacity by the stiffening structure such is at least substantially of rectangular form and entirely embedded in the pallet.

[0014] Advantageously, the stiffening structure comprises at least one bar or strip or a plurality of bars or strips put together to form the rectangular structure, or the structure is molded in a single form. The bars or strips may be interconnected by different means, e. g. by screws or by special engaging connectors or clip connectors.

[0015] A preferable embodiment of the pallet comprises a stiffening structure wherein the bars possess protrusions and recesses wherein the protrusions are put into the recesses to form a complete structure of interspaced or interstitial bars.

[0016] Preferably, the bars or strips are at least partially of wood or of a high density plastic material.

[0017] To avoid the nesting and spreading of insects during overseas transport the bars or strips are entirely surrounded by a plastic material of low density.

[0018] According to a preferable embodiment of the invention the material of the bars or strips is propylene or another plastic material having a density of about 80 g / dm^3.

[0019] Preferably, the parts surrounding the bars or strips are made of foamed plastic material, especially of foamed polypropylene, having a density of about 20 g / dm^3.

[0020] A very simple structure of a pallet that is easy to assemble comprises at least one bar or strip extending in a direction rectangular to the direction in which forklift tines extend which are to lift and lower the pallet.

[0021] In a special embodiment of the invention it is

provided for that the at least one bar or strip extends in the vicinity of the front side and/or of the rear side of a household appliance to be put on the upper side of the pallet.

[0022] Preferably, the corners of the pallet are formed to at least partially overlap the sidewalls of the household appliance; thus the sidewalls are protected against being damaged during transport. If the corners have an indentation or a recess on their undersides the pallets are easy to be stacked.

[0023] In another advantageous embodiment of the invention the pallet comprises projections or protrusions and recesses or depressions on its upper side which respectively correspond to projections and recesses of the household appliance to be stacked on the pallet. Further, the recesses or through holes serve to save material and to make the pallets more lightweight. Preferably, two channels or indentations are provided for inserting the tines of a forklift.

[0024] Thus, the pallet according to the present invention combines a plurality of advantages that makes it a comfortable means to the handling of household appliances during transport and storing.

Brief Description of the Drawings

[0025]

Figure 1 is a perspective view of a plastic pallet,
Figure 2 is a perspective view of a grid structure comprised by the pallet and
Figure 3 is a cross-sectional view along a line A - A in Fig. 1.

[0026] While this invention is susceptible of embodiments in many different forms, there is shown in the drawings and will herein be described in detail a preferred embodiment of the invention. However, the present disclosure is to be considered as an exemplification of the principles of the invention and is not intended to limit the broad aspect of the invention to the embodiment illustrated.

[0027] A pallet 1 (fig. 1) is generally rectangular in shape and consists of a plastic material that forms the base and the deck of the pallet 1 whereas in the interior of the pallet 1 a stabilizing bar or a plurality of stabilizing or reinforcing bars or a grid or lattice of such strengthening material is arranged that is covered and completely surrounded by the plastic material.

[0028] The pallet 1 comprises four sidewalls 2 to 5 that raise on each of the sides of the pallet 1 wherein opposing side are substantially parallel to each other. On their exterior side the sidewalls 2 to 5 are substantially vertical whereas to the interior of the pallet 1 the sidewalls 2 to 5 may have an inclined surface that slopes from the exterior to the interior. At the corners of the sidewalls 2 to 5 four projections 6 to 9 serve to hold the appliance in the measurements of the pallet 1. Therefore, the projections 6 to 9 possess recesses on their interior vertical sides that are adapted to the corners of a household appliance or any other product to be transported by the pallet 1. Additionally, the projections 6 to 9 preferably have the form of hollow cones so as to permit inserting of projections of the same form at their undersides. Therefore, it is possible to stack a plurality of pallets 1 wherein the projections 6 to 9 of an underlying pallet fit into the cavities on the undersides of the projections 6 to 9 of the upperlying pallet.

[0029] The pallet 1 possesses a plurality of round or rectangular indentations or recesses 10, 11 which serve to save material or that may receive parts on the underside of a household appliance positioned on the pallet 1 or any accessory part of the appliance.

[0030] A plurality of the recesses 6 forms a grid or a rib structure in the pallet 1. This grid structure may, however, be reinforced in its interior by a structure of a strengthening material such as a plurality of bars that are arranged in a rectangular form 12 as shown in fig. 2. The recesses 6 may be arranged on the upper side of the pallet 1 only or also on the underside. In another embodiment they are embodied as bores connecting the upper side to the downside of the pallet 1. The from 12 may be monolithic or consist of a plurality of bars 13 interleaved with each other.

[0031] The pallet 1 comprises strengthening bars that are arranged preferably in the proximity of the sidewalls 2 to 5 such as bar 14 (fig. 3). The bars may be made from wood, preferably however, they are made from a plastic material having a higher density than the material used for the surrounding exterior parts of the pallet 1. A suitable material is high density polypropylene, having a density of about 80 g / dm^3. Therefore, after the grid structures 12 and stiffening bars 13 are molded in molding forms they are put in another molding in which they are covered by another plastic material having a lower density, such as a low density polypropylene material having a density of about 20 g / dm^3.

[0032] In another embodiment of the invention the pallet 1 may be comprised of two major components: an upper part, a deck, and a lower part, a base that may be connected by special connectors that are suitable to ensure a stable connection between the upper and the lower part. When put together, the upper and the lower part form a cavity in the interior that is provided for receiving the reinforcing bars or strips or a reinforcing grid structure.

[0033] In each embodiment of the invention lateral apertures 15, 16 may be provided to receive the forklift tines. In the alternative, special recesses may be provided in the lateral surfaces of the side walls 4, 5. Many different embodiments of the invention may be realized wherein reinforcing parts are foreseen to support the appliance to be put on the pallet. As the surfaces of the pallet are entirely constituted of a plastic material it has a high resistivity against environment influences and may not be damaged by insects.

Claims

1. Pallet (1) or base pad for storing and transporting goods comprising a stiffening structure (12) and plastic material surrounding the stiffening structure (12).

2. Pallet (1) according to claim 1 wherein the stiffening structure (12) is at least substantially of rectangular form.

3. Pallet (1) according to claim 1 or 2 wherein the stiffening structure (12) comprises at least one bar or strip or a plurality of bars or strips put together to form the rectangular structure or molded in a single form.

4. Pallet (1) according to any of the preceding claims wherein the bars possess protrusions and recesses wherein the protrusions are put into the recesses to form a complete structure of interspaced or interstitial bars.

5. Pallet (1) according to any of the preceding claims wherein the bars or strips are at least partially of wood or of a high density plastic material.

6. Pallet (1) according to any of claims 2 to 5 wherein the bars or strips are entirely surrounded by plastic material of low density.

7. Pallet (1) according to claim 5 or 6 wherein the material of the bars or strips is propylene or another plastic material having a density of about 80 g / dm^3.

8. Pallet (1) according to claim 6 wherein the material surrounding the bars or strips is a foamed plastic material having a density of about 20 g / dm^3.

9. Pallet (1) according to any of the preceding claims wherein at least one bar (14) or strip extends in a direction rectangular to the direction in which forklift tines extend which are to lift and lower the pallet (1).

10. Pallet (1) according to any of claims 5 to 9 wherein the at least one bar (14) or strip extends in the vicinity of the front side and/or of the rear side of a household appliance to be put on the upper side of the pallet (1).

11. Pallet (1) according to claim 10 wherein the corners (6 to 9) of the pallet (1) are formed to at least partially overlap the side walls of the household appliance.

12. Pallet (1) according to claim 11 wherein the corners (6 to 9) have an indentation or a recess on their undersides

13. Pallet (1) according to any of the preceding claims wherein the pallet (1) is stackable.

14. Pallet (1) according to any of the preceding claims wherein the pallet (1) comprises projections or protrusions and recesses (10, 11) or depressions which respectively correspond to projections and recesses of the household appliance to be stacked on the pallet.

15. Pallet (1) according to any of the preceding claims wherein the pallet (1) comprises two channels or indentations (15, 16) that are provided for inserting the tines of a forklift.

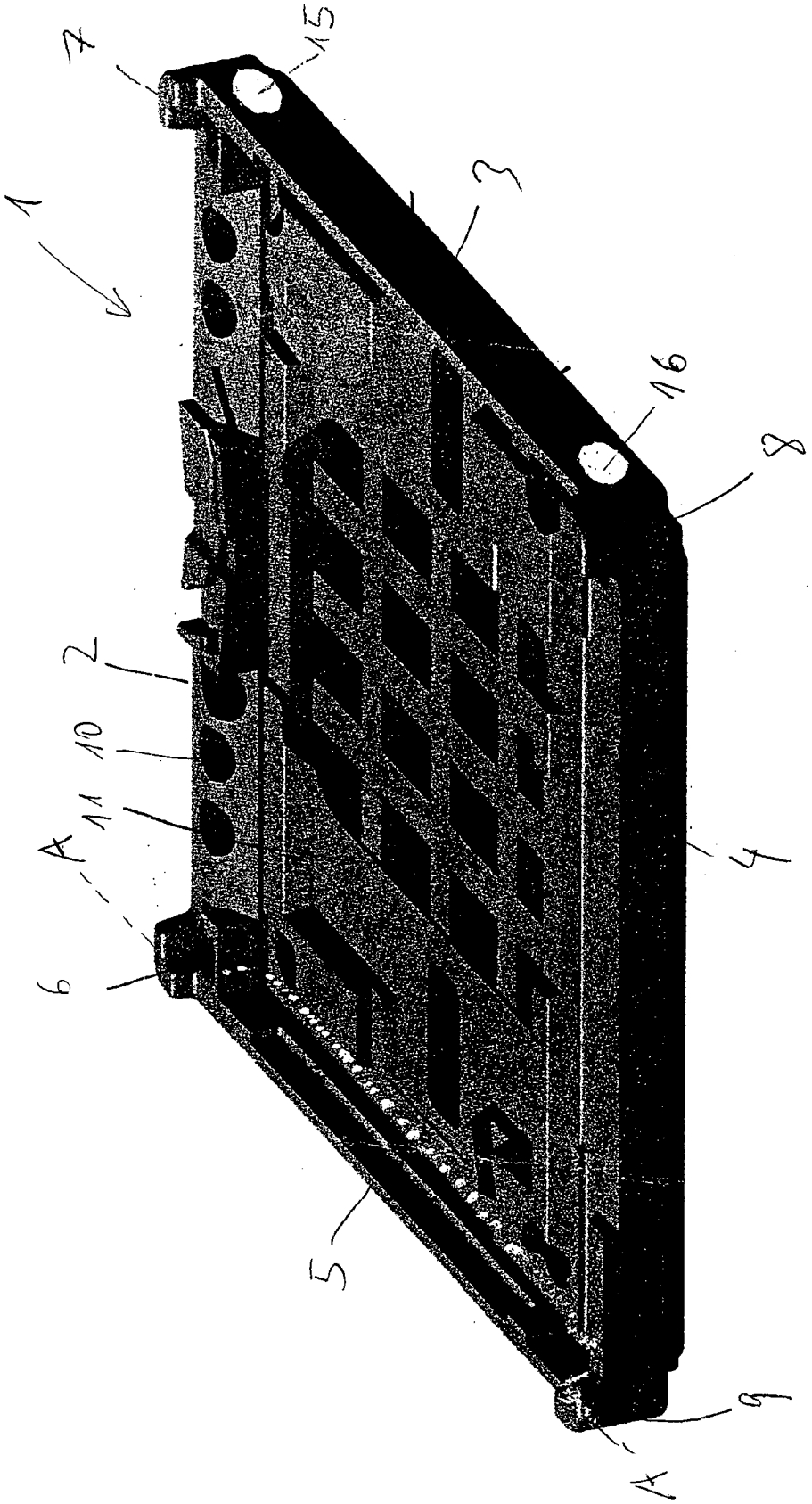


Fig. 1

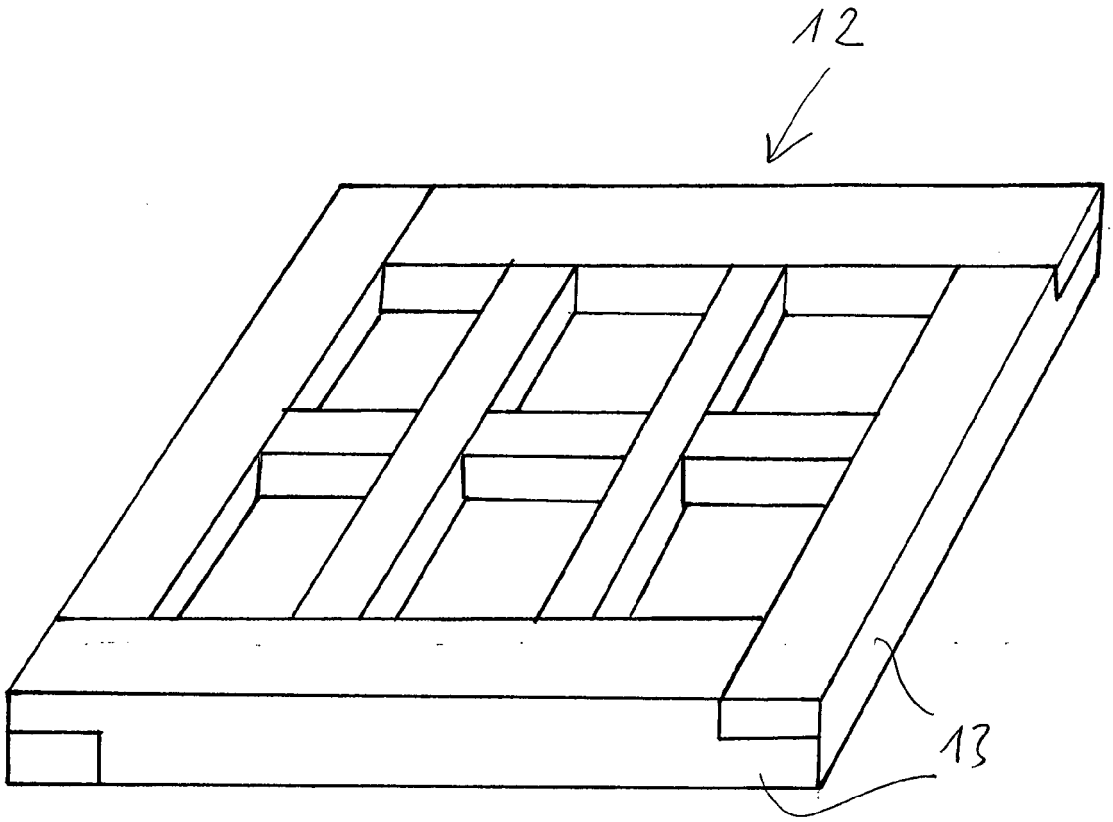


Fig. 2

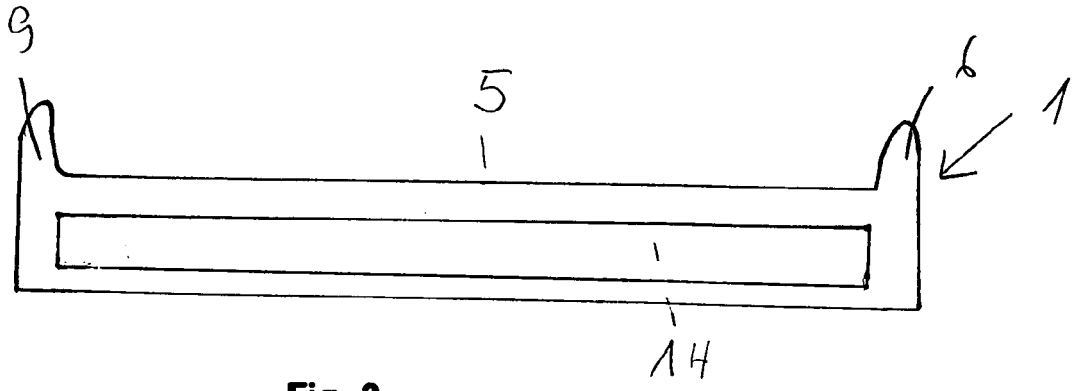


Fig. 3

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EUROPEAN SEARCH REPORT

Application Number
EP 07 00 9004

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	DE 19 26 053 A1 (KARL MUENCH OHG) 26 November 1970 (1970-11-26)	1-6, 8-10,13, 15	INV. B65D19/22
Y	* page 2 - page 5; claims 1,2,4; figures 1,2 *	11,12,14	

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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	29 October 2007	Fitterer, Johann

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

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