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(54) **Stackable tray**

(57) A stackable tray (4) includes a tray body (10), which is formed by a cardboard blank consisting of a heat resistant cardboard, wherein according to the invention a guiding means is provided which allows for a shifting of the tray (4) relative to a similar tray (6) located below

the tray (4) in a first direction parallel to its surface, when the tray (4) is stacked on a similar tray (6), and wherein a shifting in a second direction (24) which is substantially perpendicular to the first direction (22) parallel to its surface is substantially prevented.

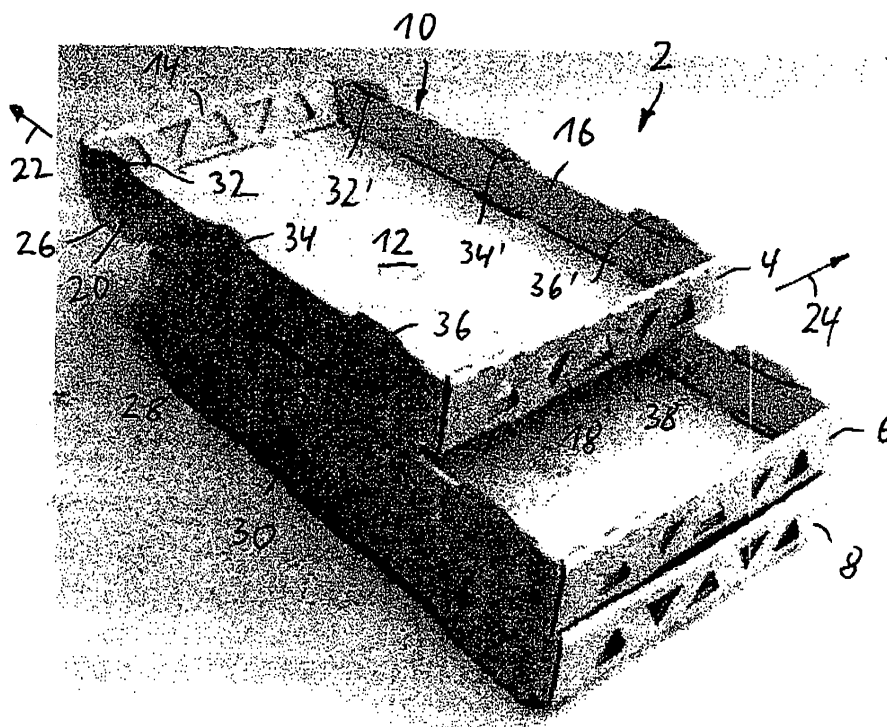


Fig. 1

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Description

[0001] The invention relates to a stackable tray as defined in the preamble of claim 1.

[0002] A tray of this kind is known from WO2004/08285 A1 and is particularly suited for serving food onboard aircraft. This known tray includes a tray body which is formed by a cardboard blank. In order to allow for heating food received on the tray in a hot-air oven, the cardboard blank is made of a heat-resistant cardboard. In order to enhance the stability of a stack consisting of a plurality of similar trays, the upper side of the tray is provided with protrusions, which are located on opposing side walls, and which extend from the respective opposing side walls upwardly. In a stack of trays the protrusions are received in recesses, which are formed on the lower side of the tray which is stacked above the tray in question.

[0003] It is an object of the invention to provide a tray as defined in the preamble of claim 1 the handling of which is simplified.

[0004] This object is achieved by the teaching of claim 1.

[0005] It is a basic idea of the teaching according to the invention to construct a tray such that the stability of a stack consisting of a plurality of such trays is high, but to provide for shifting of the trays relative to each other. According to the invention guiding means is provided which, when the tray is stacked upon a similar stack, allows for a shifting of the trays relative to each other in a first direction parallel to its surface, while shifting in a second direction which is perpendicular to the first direction is prevented.

[0006] Given that according to the invention shifting of the trays relative to each other in a first direction, e.g. in the longitudinal direction of the trays, is possible, the handling of the trays according to the invention is simplified. If a stack consisting of a plurality of trays according to the invention is used in a hot-air oven onboard an aircraft, owing to the stability of the stacks relative to each other, a single tray may be removed from the stack by pulling it from the stack in the longitudinal direction. Therefore, removing trays from the stack is simplified substantially.

[0007] Likewise, the stacking of trays according to the invention is substantially simplified, given that when stacking one tray on another tray, the upper tray may be slid on the lower tray.

[0008] The tray according to the invention is simple, may be manufactured at low costs, and may be used in multiple ways. The tray according to the invention is particularly suited for receiving and serving food onboard aircraft.

[0009] The guiding means provided by the invention may be embodied in a suitable manner as long as the guiding means provides for a shifting in the first direction while shifting in the second direction is substantially prevented.

[0010] In order to construct the tray according to the invention in a particularly simple and cost-effective man-

ner, according to a preferred embodiment the guiding means includes at least two tongue-like or flap-like guiding elements which extend downwardly on opposing sides of the tray body and which in the stacked position overlap the tray body of a tray stacked below in the stack. Therefore, on the one hand a high stability of a stack of trays is obtained; and, on the other hand, shifting the trays relative to each other in the first direction, e. g. in the longitudinal direction of the trays, is possible.

[0011] The shape, number, size, and construction of the guiding elements may be varied within wide limits. In order to enhance the stability of a stack consisting of a plurality of trays according to the invention and to simultaneously improve the guiding of the trays relative to each other upon shifting in the first direction, a further preferred embodiment provides that on at least one side edge of the tray body at least two guiding elements are located which are spaced relative to each other along the side edge.

[0012] In the embodiments described above, it is preferred that the guiding elements extend along the side edge over a substantial part, in particular over 20 to 40 per cent of the length of the side edge.

[0013] In order to further enhance the stability of the stack and the guiding of the trays relative to each other, it is preferred that on each of two opposing side edges of the tray body at least two guiding elements are located which are spaced relative to each other along the side edge.

[0014] Fundamentally, it is sufficient if guiding elements are provided which extend downwardly from the tray body. According to a preferred embodiment of the invention, the tray body includes walls, wherein, from opposing walls related to a side edge, at which side edge at least one guiding element is located, at least one guiding element extends upwardly. By this means the stability of the stack and the guiding of the trays relative to each other is further enhanced.

[0015] Basically, the guiding element or the guiding elements may be separate elements which are connected to the tray body. In order to simplify the manufacturing of trays according to the invention, it is preferred that at least one of the guiding elements is integral with the tray body.

[0016] A stack of trays according to the invention consists of at least two trays according to the invention as claimed in claim 7.

[0017] The invention will now be explained in greater detail with reference to the accompanying drawings, wherein all features which are claimed in the claims or described in the specification or which are shown in the drawings define the subject matter of the invention, either taken alone or in any combination with each other, regardless of their combination in the claims, as well as regardless of the wording used in the specification, and the representation used in the drawings.

[0018] In the drawings:

- Fig. 1 is a perspective view of a stack of trays consisting of a plurality of trays according to the invention, wherein one tray is shown in a position shifted relative to the rest of the stack,
- Fig. 2 is a side view of the stack shown in figure 1, wherein the trays are not shifted relative to each other,
- Fig. 3 is a front view of the stack according to Fig. 1 and
- Fig. 4 is a plan view of a cardboard blank used for manufacturing an embodiment of a tray according to the invention.

[0019] Fig. 1 shows a stack 2 of trays, including trays 4, 6, 8 according to an embodiment of the invention. For ease of discussion, only three trays 4, 6, 8 are shown in Fig. 1. However, according to the invention it is possible to stack more than three trays. In the following, only tray 4 will be explained. The trays 6, 8 are constructed in a likewise manner.

[0020] The tray 4 includes a tray body 10 which includes a bottom 12 and walls 14, 16, 18, 20. The tray body consists of a cardboard blank (see Fig. 4) which is manufactured from a heat-resistant cardboard.

[0021] According to the invention, a guiding means is provided which in a stack 2 of trays provides for a shifting of the tray relative to tray 6 in a first direction, which in this embodiment corresponds to the longitudinal direction of tray 4, and which is marked by an arrow 22. As can be seen in Fig. 1, the first direction is parallel to the surface of tray 4. Furthermore, the guiding means prevents the trays from shifting in a second direction, which corresponds to the transverse direction of tray 4, and which is marked by an arrow 24 in Fig. 1.

[0022] In the illustrated embodiment, the guiding means includes tongue-like or flap-like guiding elements 26, 28, 30, which extend from a side edge of a tray body 12 downwardly, and which in the stacking position overlap the tray body of tray 6 placed under tray 4.

[0023] As shown in Fig. 1, guiding elements 26, 28, 30 are spaced relative to each other along the side edge. It cannot be seen in Fig. 1 that on the opposing side edge of the tray corresponding guiding elements 26', 28' and 30' are located so that the guiding elements 26, 28, 30 and 26', 28', 30' overlap the tray body of tray 6 placed under tray 4 on both sides. It furthermore cannot be seen in Fig. 1 that pairs of the guiding elements 26, 26' and 28, 28' and 30, 30' respectively are in alignment with each other. In the embodiment shown in Fig. 1 further guiding elements 32, 34, 36 and 32', 34', 36' are provided which extend upwardly from opposing walls 16, 20.

[0024] In order to enable heating of food received on the trays 4, tray body 10 includes a plurality of openings for hot air, wherein in Fig. 1 only one of the openings is referenced by reference numeral 38.

[0025] As shown in Fig. 1, the tray 4 is shiftable in the direction of the arrows 22 by means of the guiding elements 26, 28, 30 and 26', 28', 30'. However, a shifting in

the direction 24 is substantially prevented.

[0026] As can be seen in Fig. 2, which shows a side view of stack 2, the guiding elements 26', 28', 30' of tray 4 overlap the tray body of tray 6 on its upper side.

[0027] Fig. 3 shows a front view of stack 2.

[0028] Fig. 4 shows a plan view of a cardboard blank from which the tray body 10 of tray 4 is formed. As shown, the guiding elements 26, 28, 30 and 26', 28', 30' respectively as well as the further guiding elements 32, 34, 36 and 32', 34', 36', respectively, are integral with the tray body 10.

[0029] The tray according to the invention may be manufactured easily and at low cost. By means of the tray according to the invention, a stack consisting of a plurality of trays has high stability and may be handled in an easy manner owing to the shiftability of the trays relative to each other in the first direction.

20 Claims

1. Stackable tray, including a tray body, which is formed by a cardboard blank consisting of a heat resistant cardboard, **characterized by** guiding means, and which guiding means allows for a shifting of the tray (4) relative to a similar tray (6) located below the tray (4) in a first direction parallel to its surface, when the tray (4) is stacked on a similar tray (6), wherein a shifting in a second direction (24) which is substantially perpendicular to the first direction (22) parallel to its surface is substantially prevented.
2. Stackable tray as claimed in claim 1, **characterized in that** the guiding means includes at least two tongue-like or flap-like guiding elements (26, 26'), which guiding elements extend from opposing side edges of the tray body (10) from the lower side of the tray body, and which guiding elements overlap the tray body of a tray stacked below the tray (4) on both sides.
3. Tray as claimed in claim 2, **characterized in that** on at least one side edge of the tray body (10) at least two guiding elements (26, 28, 30) are located, said guiding elements (26, 28, 30) being spaced relative to each other.
4. Tray as claimed in claim 2, **characterized in that** on two opposing side edges of the tray body (10) at least two guiding elements (26, 28, 30, 26', 28', 30') are located, said guiding elements being spaced relative to each other.
5. Tray as claimed in any of claims 2 to 4, **characterized in that** the tray body (10) includes walls (14, 16, 18, 20), wherein from opposing walls (16, 20),

which are located at a side edge respectively at which at least one guiding element (26, 28, 30, 26', 28', 30') is located, at least one further guiding element, (32, 34, 36, 32', 34', 36') extends upwardly.

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6. Tray as claimed in any of claims 2 to 5, **characterized in that** at least one of the guiding elements (26, 28, 30, 26', 28', 30') is integral with the tray body.

7. Stack of trays, **characterized in that** it includes at least two trays (4, 6, 8) as claimed in any of the preceding claims, said trays (4, 6, 8) being stacked on each other.

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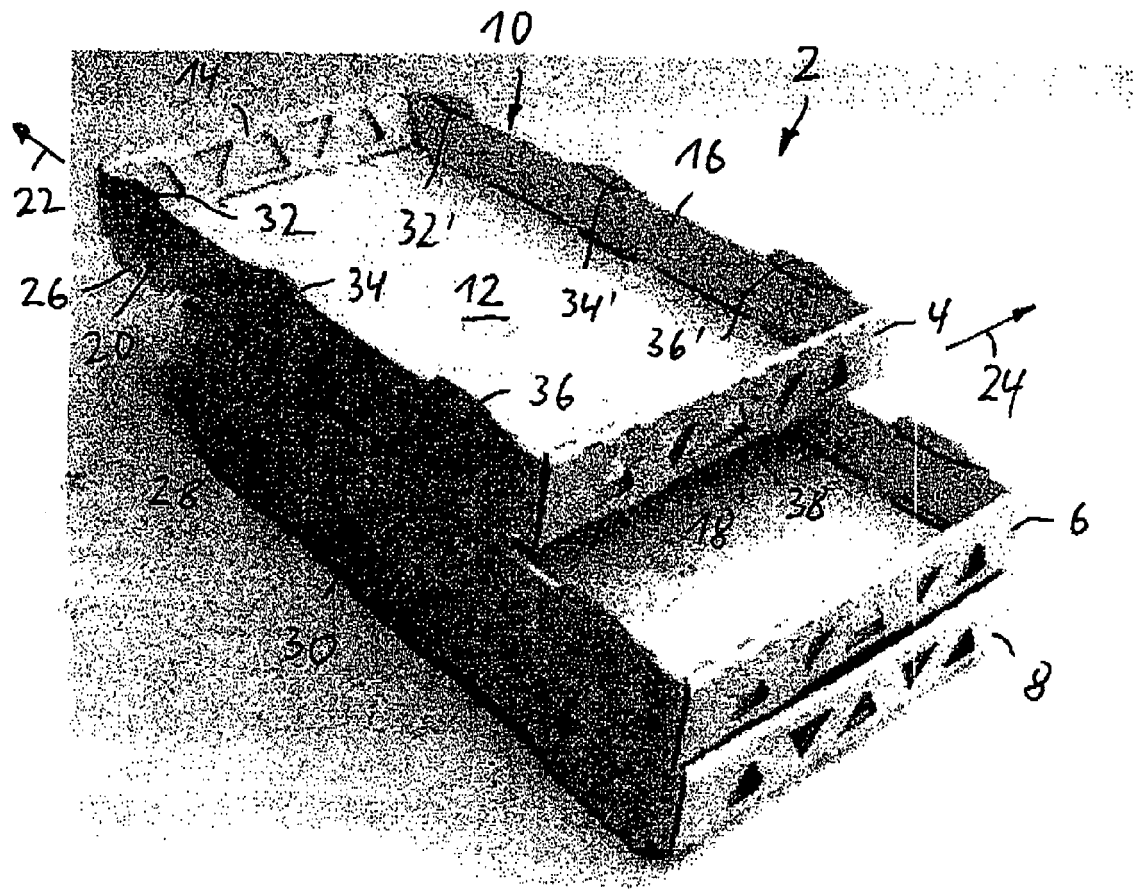


Fig. 1

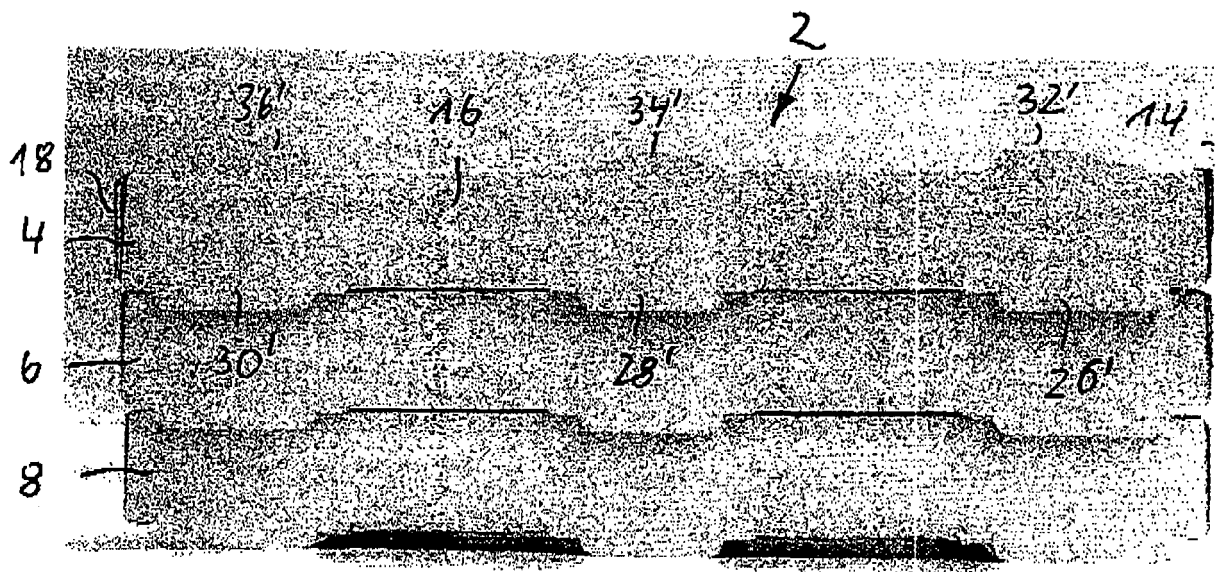


Fig. 2

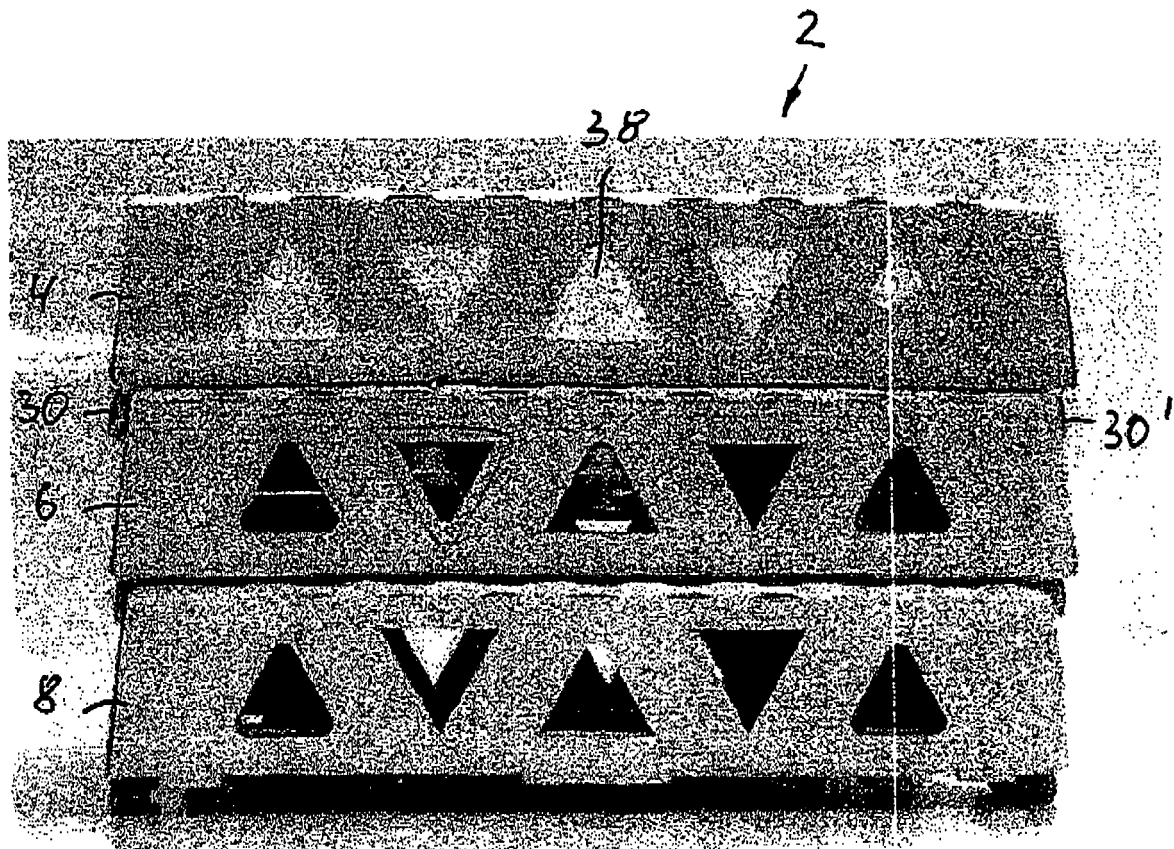


Fig. 3

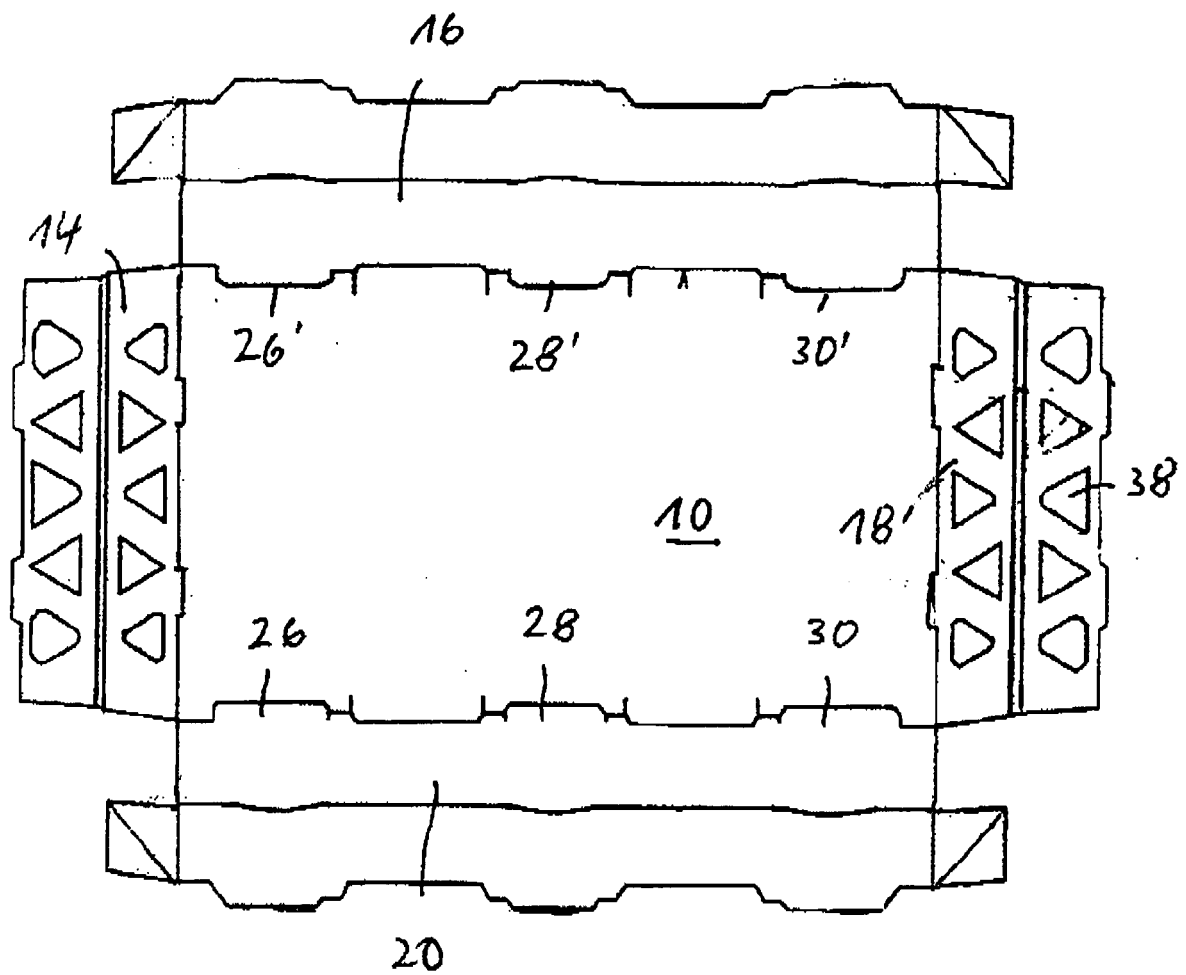


Fig. 4



DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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Y	* the whole document *	5	
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A	FR 2 411 091 A1 (VAL REX [FR]) 6 July 1979 (1979-07-06) * the whole document *	1-7	
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The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 18 June 2007	Examiner Visentin, Mauro
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**ANNEX TO THE EUROPEAN SEARCH REPORT
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EP 07 00 4570

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

REFERENCES CITED IN THE DESCRIPTION

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