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(54) Plank support for a plank in a rack

(57) Shelf support for a shelf in a rack, comprising a first protruding support member which can be coupled to a post of said rack and a second protruding support member which is displaceable along said first protruding support member and coupled thereto, which second protruding support member is provided with a support element for a shelf which extends along said second protruding support member and is coupled thereto for tilting over a determined angle.

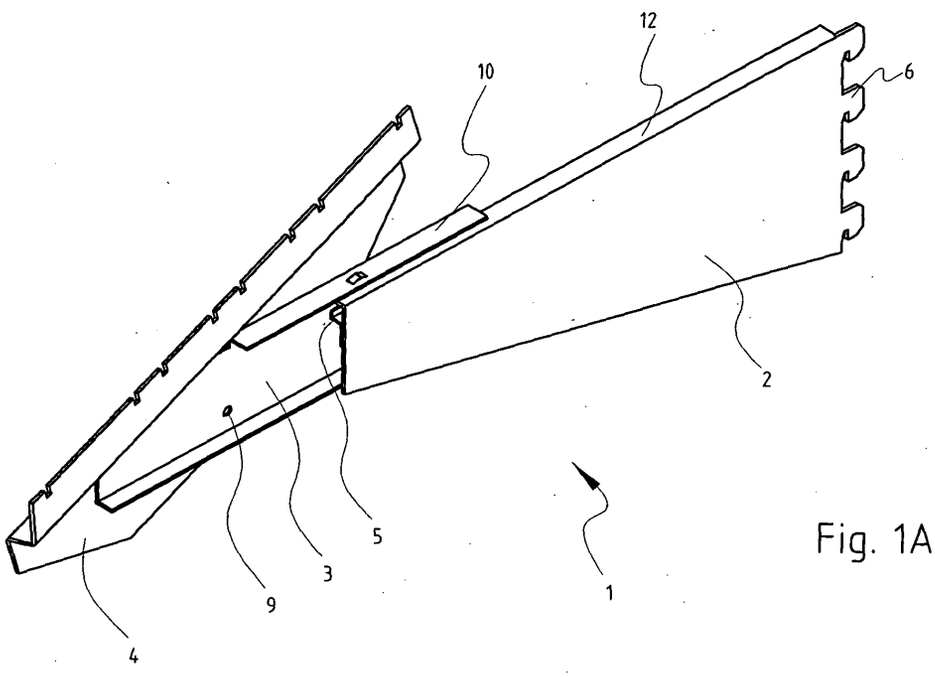

Fig. 1A

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Description

[0001] The invention relates to a shelf support for a shelf in a rack. Such a rack is intended particularly for placing along a wall or in a free space in a supermarket such that supermarket staff or buyers can walk along the racks with a pallet truck or shopping trolley to respectively stock these racks or collect goods displayed therein.

[0002] Known from the American patent no. 5 160 051 is a rack wherein four posts placed at the corners of a rectangle are connected along the long sides of this rectangle by horizontal supports placed at different heights. Placed on opposite pairs of supports are rectangular containers for displaying of goods thereon. As a consequence of the differing height of the supports, the containers are oriented obliquely downward toward the front, i.e. toward the customer, and goods placed in these containers slide to the front under the influence of gravity. Proper functioning of the known rack achieves that the goods supplied first are always within direct reach of the customer, and the most recently supplied goods are furthest removed from the customer, which is of course conducive to realizing a flow of goods on the basis of the "first in-first out" principle.

[0003] It is a drawback of the known rack that goods placed therein can tip over when handled carelessly by the customer, as a result of which the relevant container appears, wrongly, to be empty. It is known for instance that elongate, high and therefore not very stable packs with dairy products tip over easily in such sloping containers.

[0004] It is a further drawback of the known rack that it is awkward for supermarket staff to fill the sloping containers with new goods since, as the container becomes further filled from the relatively low forward part, the relatively high rear part becomes increasingly difficult to access. Filling of such a rack is therefore labour-intensive, and therefore relatively expensive.

[0005] It is an object of the invention to provide a shelf support for a shelf in a rack with which goods, as they are supplied, can be placed in easy manner beyond the direct reach of a customer, and whereby it is precisely those goods already present on this shelf which can be placed in easy manner within reach of a customer.

[0006] It is also an object to provide such a shelf support which can be manufactured in simple and efficient manner.

[0007] These objectives are achieved, and other advantages gained, with a shelf support for a rack which according to the invention comprises a first protruding support member which can be coupled to a post of this rack and a second protruding support member which is displaceable along this first protruding support member and coupled thereto and which is adapted to support a shelf for displacement and for tilting over a determined angle.

[0008] In a rack wherein a shelf rests on at least two shelf supports according to the invention, for the purpose of replenishing the stock on this shelf it is possible in simple manner to pull the shelf forward, i.e. toward the user, and then tilt it through a determined angle so that this shelf protrudes from the rack in a downward sloping orientation. In order to prevent goods placed on the shelf falling off this shelf in the downward oriented position thereof, a shelf for a support according to the invention is preferably provided on its front side with a standing edge. When the shelf is tilted goods that are still present slide forward, whereafter freshly supplied goods, for instance of a more recent production date, can be placed behind these goods that are still present. Replenishing stocks in this manner provides practical advantages particularly in the case of shelves arranged relatively high, i.e. eye level.

[0009] In an embodiment of a shelf support according to the invention, the second protruding support member is provided with a support element for a shelf extending along this second protruding support member and coupled thereto for tilting through a determined angle.

[0010] The first protruding support member is herein provided for instance with a guide rail for guiding therein at least one guide element coupled to the second protruding support member, which guide element for instance comprises a roller bearing.

[0011] In another embodiment of a shelf support according to the invention, the second protruding support member comprises an elongate element which is formed by bending plate material and which in the situation of use is provided on its top side with a horizontal edge zone and a vertical edge extending obliquely downward therefrom for supporting the support element thereon in respectively the non-tilted and tilted situation.

[0012] In this latter embodiment the first protruding support member preferably comprises an element which is formed by bending plate material and which in the situation of use is provided on its top side with a horizontal edge zone which extends under the horizontal edge zone of the second protruding support member, wherein said edge zones are provided with co-acting bounding means for bounding the displacement of the second protruding support member along the first protruding support member.

[0013] A guide rail on a first protruding support member manufactured from plate material is preferably also manufactured from plate material, wherein guide rail and first protruding support member are for instance coupled in each case by co-acting, local plastic deformations arranged according to a method per se known from US-A-4 760 634, which is now generally designated Tox®-joining.

[0014] In order to prevent a shelf on shelf supports according to the invention unintentionally or unwittingly being pulled forward, at least one of these shelf supports is preferably provided with first locking means for locking the second protruding support member against displacement along the first protruding support member,

which first locking means for instance comprise a pin coupled to the second protruding support member and displaceable in lengthwise direction, and a hole corresponding therewith in the first protruding support member.

[0015] In yet another embodiment, the support element in a shelf support is provided with second locking means for locking a shelf supported by this support element against tilting.

[0016] The invention further relates to a rack provided with at least two shelves extending in the situation of use one above another on above described shelf supports, which rack is provided according to the invention with third locking means for locking more than one shelf against displacement.

[0017] If more than one shelf can be pulled forward out of a rack, there is the danger of the rack falling forward under the weight of goods placed on these shelves if it is not anchored. This danger is not present in a rack provided with the third locking means.

[0018] In an exemplary embodiment the third locking means comprise an elongate locking element which in the situation of use is coupled to a second protruding support member of the respective shelves and which is provided on its outer end with a first wedge-shaped part and a second wedge-shaped part in opposite direction thereto, and a vertically displaceable actuator strip provided with openings corresponding with the respective first and second wedge-shaped parts, wherein the first wedge-shaped part in each case of a first locking element is adapted for the purpose, during displacement of the second protruding support member coupled thereto from a first position, wherein the associated shelf is received in the rack, to a second position wherein this shelf is placed at least partially outside the rack, of displacing the actuator strip from a first position to a second position in which this actuator strip locks the second wedge-shaped part of a second locking element of another second protruding support member coupled thereto against displacement of this other second protruding support member, and wherein the second wedge-shaped part of this first locking element is adapted for the purpose, during displacement of the first mentioned second protruding support member from the second to the first position, of displacing the actuator strip from the second to the first position.

[0019] The invention will be elucidated hereinbelow on the basis of exemplary embodiments, with reference to the drawings.

[0020] In the drawings

Fig. 1A and 1B show respectively in perspective view and side view an embodiment of a shelf support according to the invention with extended and tilted support element;

Fig. 2A and 2B show respectively in perspective view and side view an embodiment of a shelf support according to the invention with extended and non-tilted support element;

Fig. 3A and 3B show respectively in perspective view and side view an embodiment of a shelf support according to the invention with retracted and non-tilted support element;

Fig. 4 is an exploded view of the shelf support shown in Fig. 1A-3B;

Fig. 5A and 5B show respectively in perspective and cross-sectional view an embodiment of a locking against sliding-out of a support element of a shelf support as shown in fig. 4;

Fig. 6A and 6B show respectively in side view and top view a locking of a support element against tilting in a shelf support according to the invention, and

Fig. 7A, 7B and 7C show in cross-sectional view a detail of an actuator strip and locking elements for locking of more than one shelf against displacement in a rack with support elements according to the invention.

[0021] Corresponding components are designated in the figures with the same reference numerals.

[0022] Fig. 1A - Fig. 4 show a shelf support 1 for a shelf in a rack (not shown) which is assembled from a first protruding support member 2 of bent plate material, a second protruding support member 3 of bent plate material which is coupled thereto and displaceable along this first protruding support member 2, and a support element 4 for a shelf coupled to the second protruding support member 3 and likewise of bent plate material. First protruding support member 2 is provided with hooks 6 which correspond with openings formed for this purpose in a post of a rack, and with a guide rail 5 (shown in Fig. 1B and 2B) for guiding therein two roller bearings 7 (shown in Fig. 4) which are coupled with their shafts 8 to second protruding support member 3. Support element 4 is coupled to second protruding support member 3 for tilting over a determined angle on a shaft 9. Second protruding support member 3 is provided on its top side with a horizontal edge zone 10 and a vertical edge 11 extending obliquely downward therefrom for supporting the support element 4 thereon in respectively non-tilted and tilted position. First protruding support member 2 is provided on its top side with a horizontal edge zone 12 which extends below horizontal edge zone 10 of second protruding support member 3, wherein said edge zones 10, 12 are provided with co-acting lips 14, 13 which respectively extend obliquely forward in downward direction and obliquely rearward in upward direction and which bound the displacement of second protruding support member 3 along first protruding support member 2.

[0023] Fig. 5A and 5B show a part of a support 1, wherein a pin 16 with a compression spring 17 is enclosed displaceably in an L-profile 19 fixed against support element 4, which pin protrudes permanently through second profile 3 and releasably through a hole 15 in first profile 2, whereby second profile 3 is locked

against displacement. The locking of second profile 3 is released by pulling control ring 18.

[0024] Fig. 6A shows a shelf support 1, the support element 4 of which is provided with a horizontal slot 20 in which an L-shaped locking element 21 is received releasably so as to lock support element 4 against tilting on shaft 9.

[0025] Fig. 6B shows a top view of locking element 21 which is received in a U-profile 22, fixed to second protruding support member 3, for displacement counter to the force of a spring 17.

[0026] Fig. 7A shows a post for a rack with closed rear 23 (on the left in the figure) and a front side 24 (on the right in the figure) in which openings 25 are arranged through which extend respective locking elements 26, 27 which are each connected to a second protruding support member (not shown) of a shelf support (not shown). Each locking element 26, 27 is provided on its outer end with a first wedge-shaped part 28 and a second wedge-shaped part 29 in opposite direction thereto. Received in post 23, 24 is a vertically displaceable actuator strip 30 which is provided with openings 31 corresponding with the first 28 and second wedge-shaped parts 29. Actuator strip 30 is received on its top side in a releasable clamping element (not shown).

[0027] Fig. 7B shows how, when one shelf is moved forward (to the right in the figure as according to the horizontal arrow) and when the associated second protruding support member and the relevant locking element 26 are thereby moved forward, the actuator strip 30 is pressed downward by the first wedge-shaped part 28 of locking element 26 (as according to the vertical arrow), as a consequence of which the actuator strip 30 is displaced in front of the second wedge-shaped parts 29 of the other locking elements 27, which are thus locked against forward displacement.

[0028] Fig. 7C shows the post in a situation where a locking element 26 is displaced fully forward and actuator strip 30 is in its lowest position. When the one shelf is re-placed, and therewith the associated locking element 26, the second wedge-shaped part 29 of this locking element 26 presses actuator strip 30 upward, whereby the wedge-shaped second parts 29 of the other locking elements 27 are released and one of the shelves associated with these other locking elements 27 can be pulled forward as desired, and the cycle described here is repeated.

Claims

1. Shelf support (1) for a shelf in a rack, comprising a first protruding support member (2) which can be coupled to a post (23, 24) of said rack and a second protruding support member (3) which is displaceable along said first protruding support member (2) and coupled thereto and which is adapted to support a shelf for displacement and for tilting over a determined angle.

2. Shelf support (1) as claimed in claim 1, **characterized in that** the second protruding support member (3) is provided with a support element (4) for a shelf extending along said second protruding support member (3) and coupled thereto for tilting through a determined angle.

3. Shelf support (1) as claimed in claim 2, **characterized in that** the first protruding support member (2) is provided with a guide rail (5) for guiding therein at least one guide element (7) coupled to the second protruding support member (3).

4. Shelf support (1) as claimed in claim 3, **characterized in that** the guide element comprises a roller bearing (7).

5. Shelf support (1) as claimed in any of the claims 2-4, **characterized in that** the second protruding support member (3) comprises an elongate element which is formed by bending plate material and which in the situation of use is provided on its top side with a horizontal edge zone (10) and a vertical edge (11) extending obliquely downward therefrom for supporting the support element (4) thereon in respectively the non-tilted and tilted situation.

6. Shelf support (1) as claimed in claim 5, **characterized in that** the first protruding support member (2) comprises an element which is formed by bending plate material and which in the situation of use is provided on its top side with a horizontal edge zone (12) which extends under the horizontal edge zone (10) of the second protruding support member (3), wherein said edge zones (10, 12) are provided with co-acting bounding means (14, 13) for bounding the displacement of the second protruding support member (3) along the first protruding support member (2).

7. Shelf support (1) as claimed in any of the claims 1-6, **characterized in that** it is provided with first locking means (15-18) for locking the second protruding support member (3) against displacement along the first protruding support member (2).

8. Shelf support as claimed in claim 7, **characterized in that** the first locking means comprise a pin (16) coupled to the second protruding support member (3) and displaceable in lengthwise direction, and a hole (15) corresponding therewith in the first protruding support member (2).

9. Shelf support (1) as claimed in any of the claims 2-8, **characterized in that** the support element (4) is provided with second locking means (20, 21) for

locking a shelf supported by said support element against tilting.

10. Rack provided with at least two shelves extending in the situation of use one above another on shelf supports (1) as claimed in any of the claims 1-9, **characterized in that** the rack is provided with third locking means (26, 27, 30) for locking more than one shelf against displacement.

11. Rack as claimed in claim 10, **characterized in that** the third locking means comprise an elongate locking element (26, 27) which in the situation of use is coupled to a second protruding support member (3) of the respective shelves and which is provided on its outer end with a first wedge-shaped part (28) and a second wedge-shaped part (29) in opposite direction thereto, and a vertically displaceable actuator strip (30) provided with openings (31) corresponding with the respective first (28) and second wedge-shaped parts, wherein the first wedge-shaped part (28) in each case of a first locking element (26) is adapted for the purpose, during displacement of the second protruding support member coupled thereto from a first position, wherein the associated shelf is received in the rack, to a second position wherein said shelf is placed at least partially outside the rack, of displacing the actuator strip (30) from a first position to a second position in which this actuator strip (30) locks the second wedge-shaped part (29) of a second locking element (27) of another second protruding support member coupled thereto against displacement of this other second protruding support member, and wherein the second wedge-shaped part (29) of this first locking element (26) is adapted for the purpose, during displacement of the first mentioned second protruding support member from the second to the first position, of displacing the actuator strip (30) from the second to the first position.

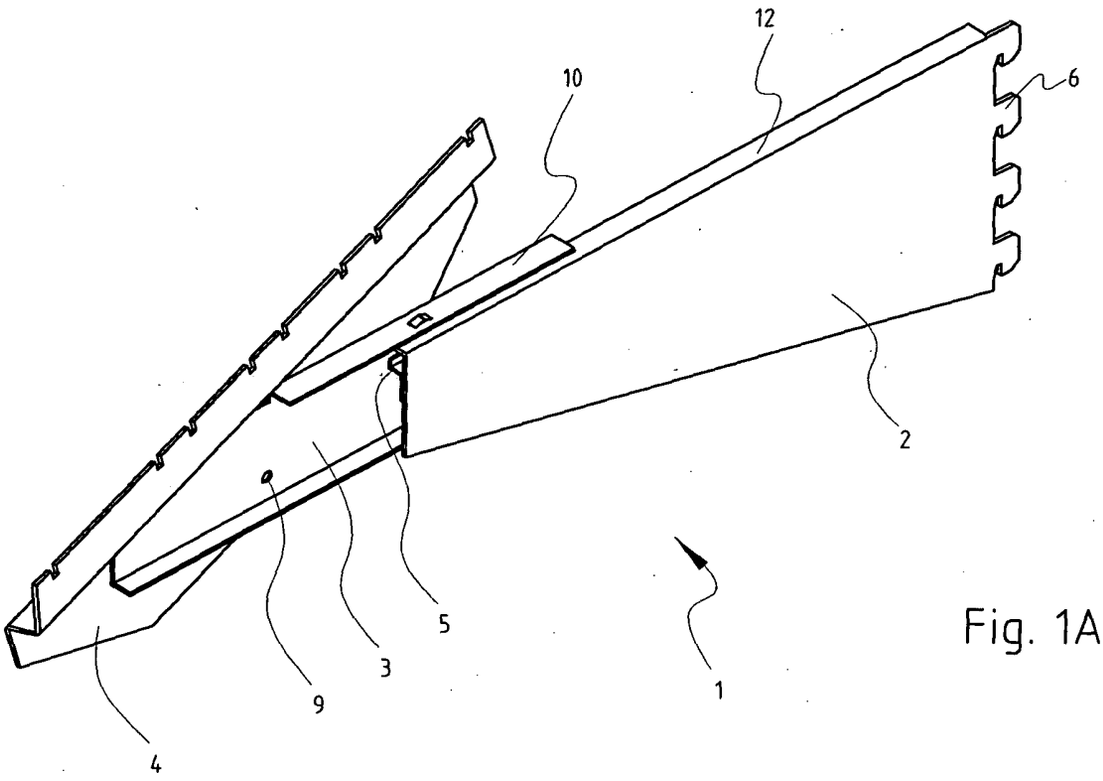

Fig. 1A

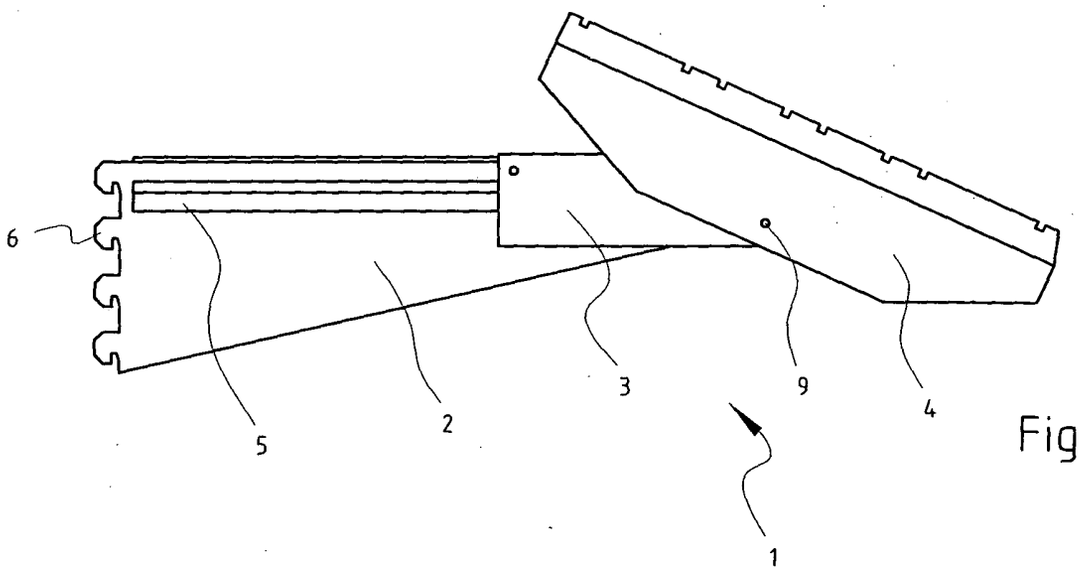

Fig. 1B

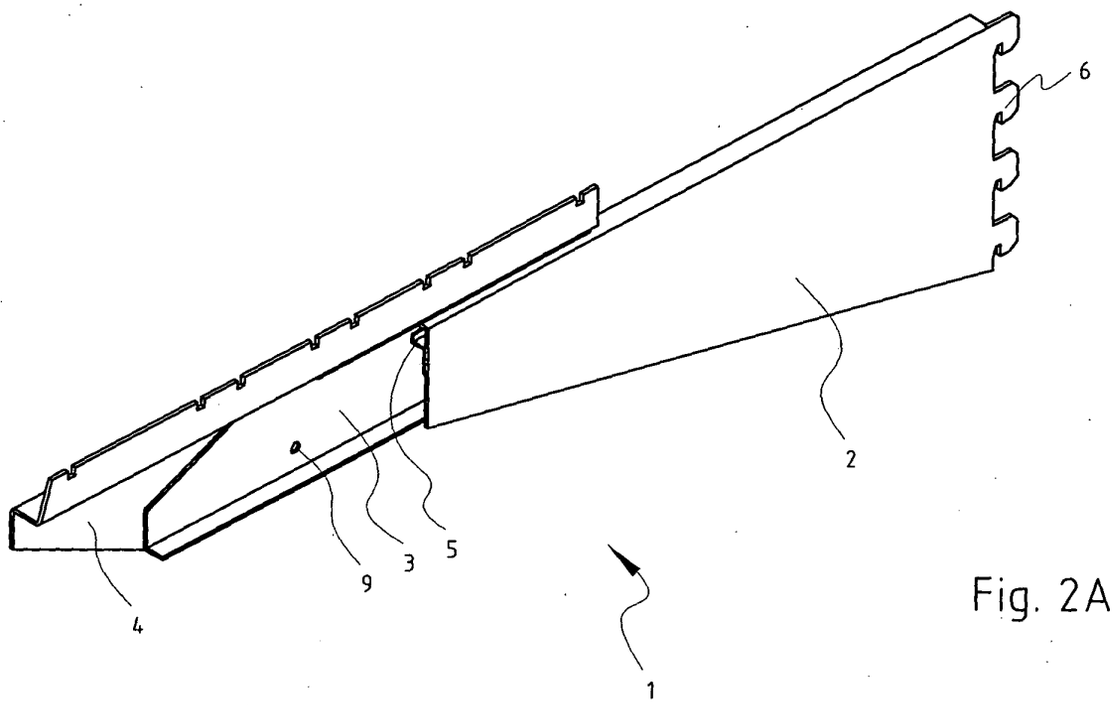

Fig. 2A

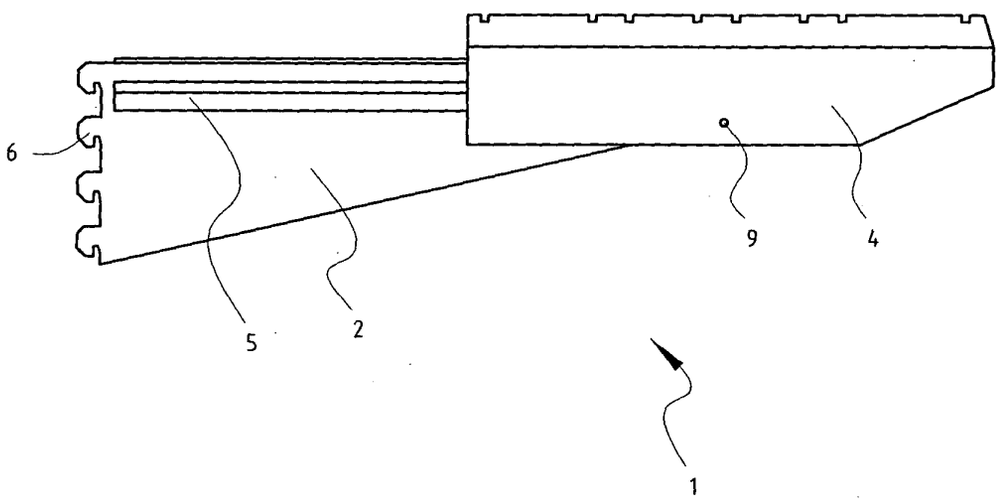

Fig. 2B

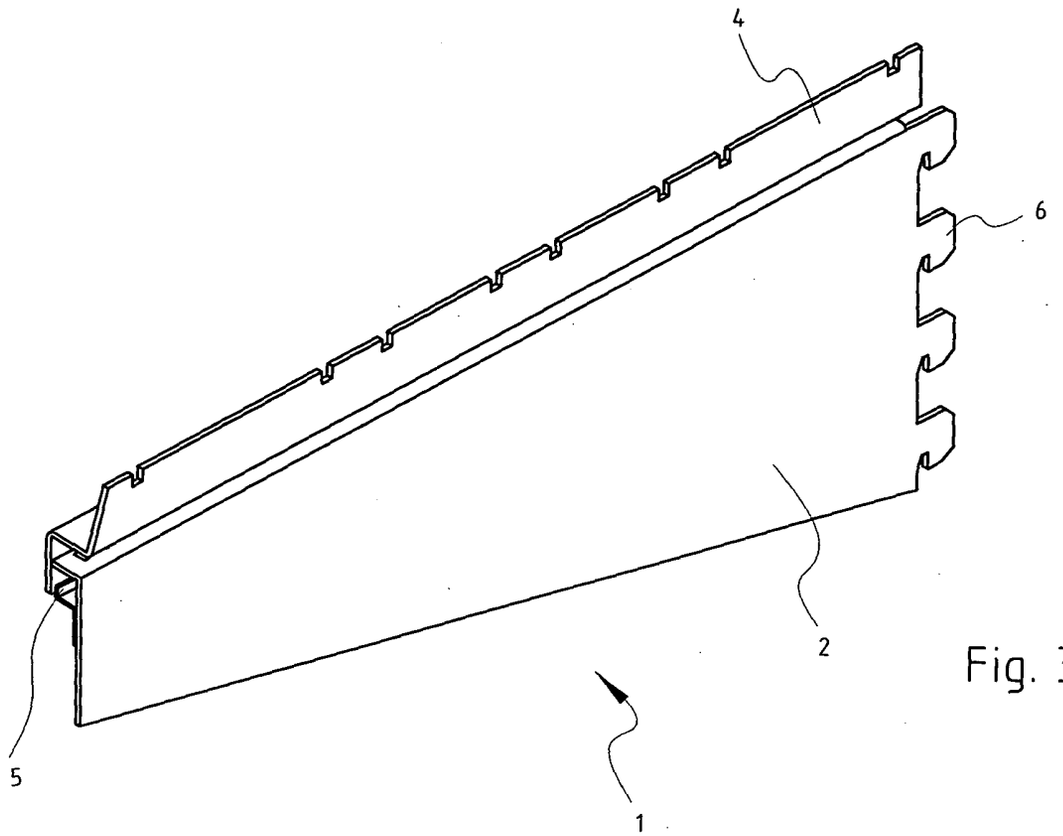

Fig. 3A

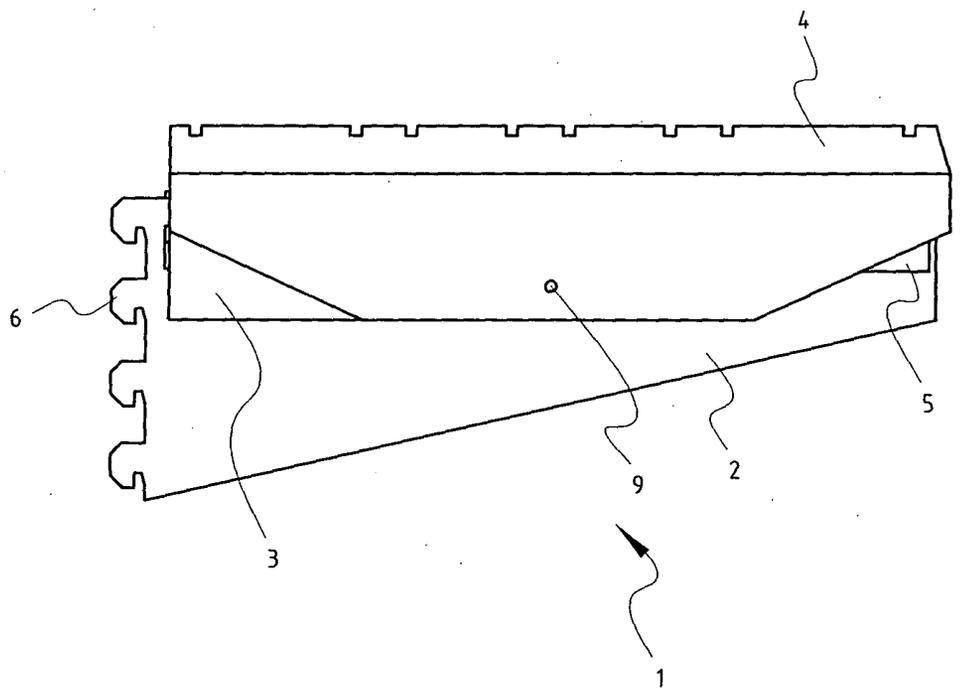

Fig. 3B

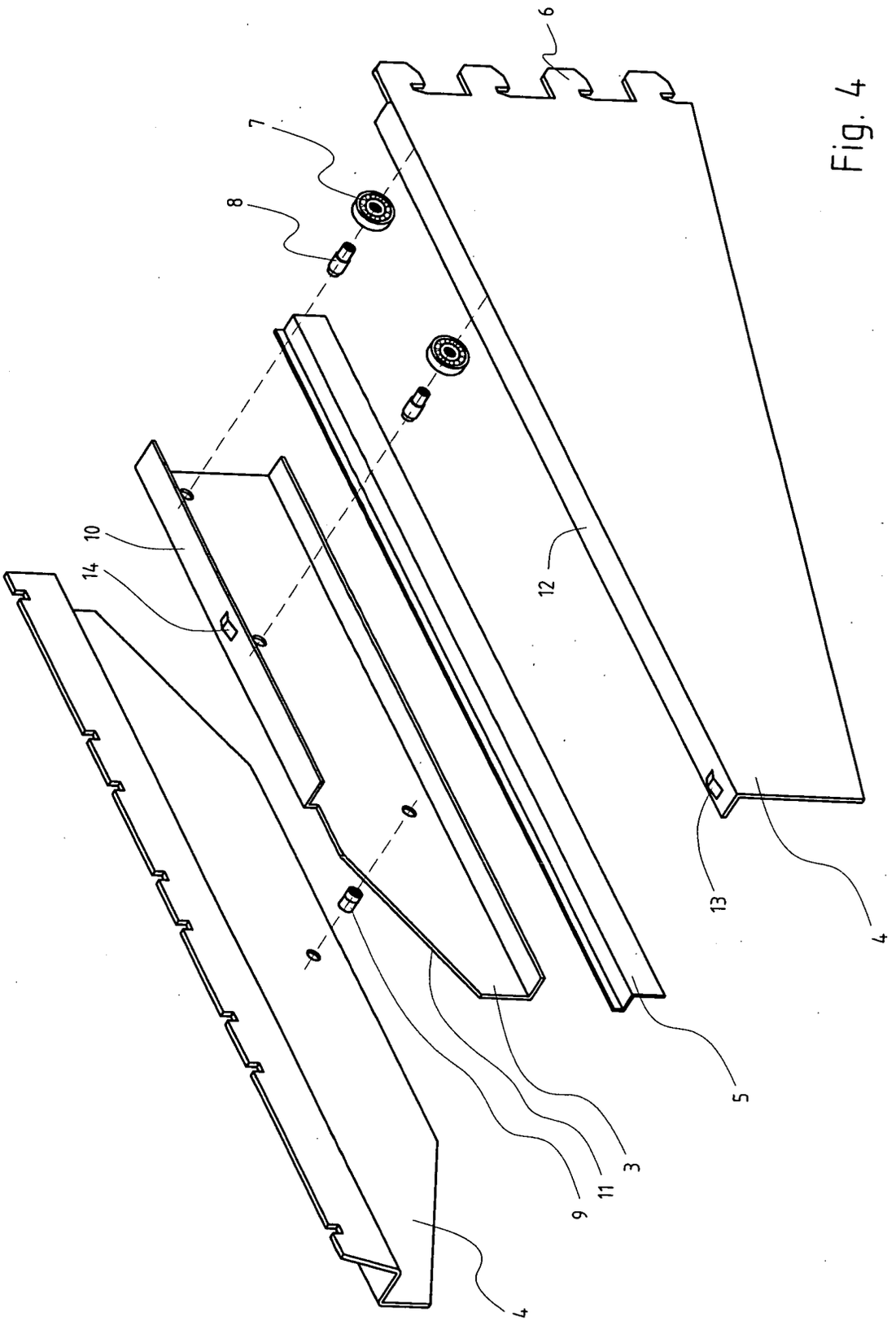

Fig. 4

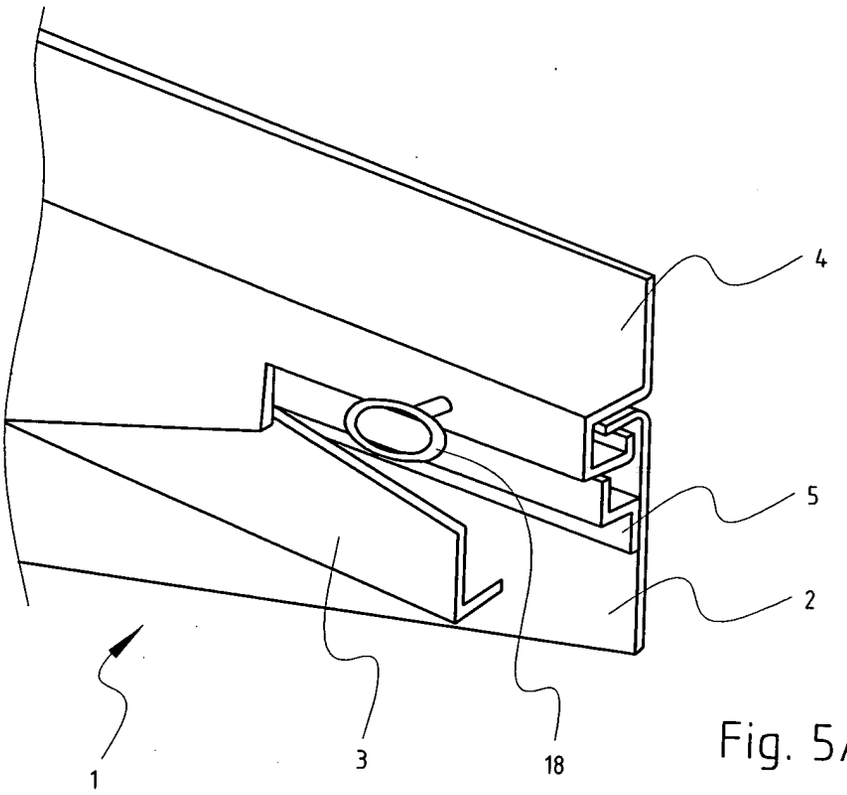

Fig. 5A

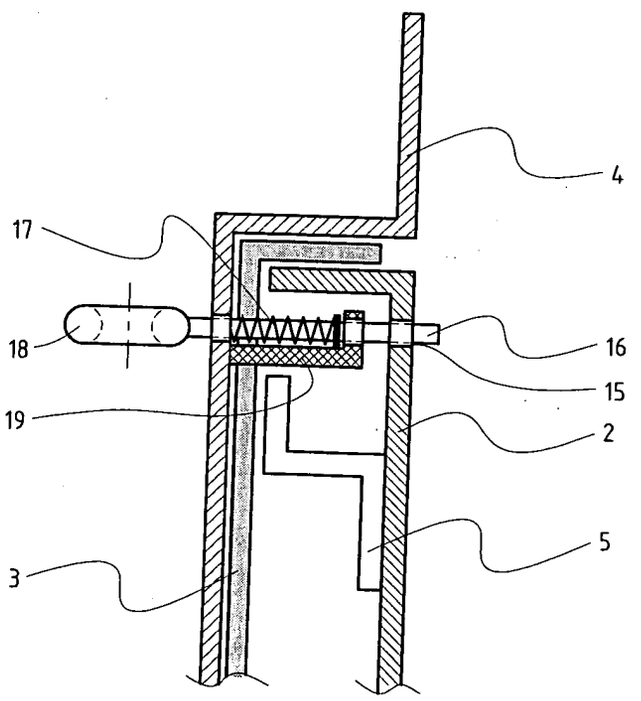

Fig. 5B

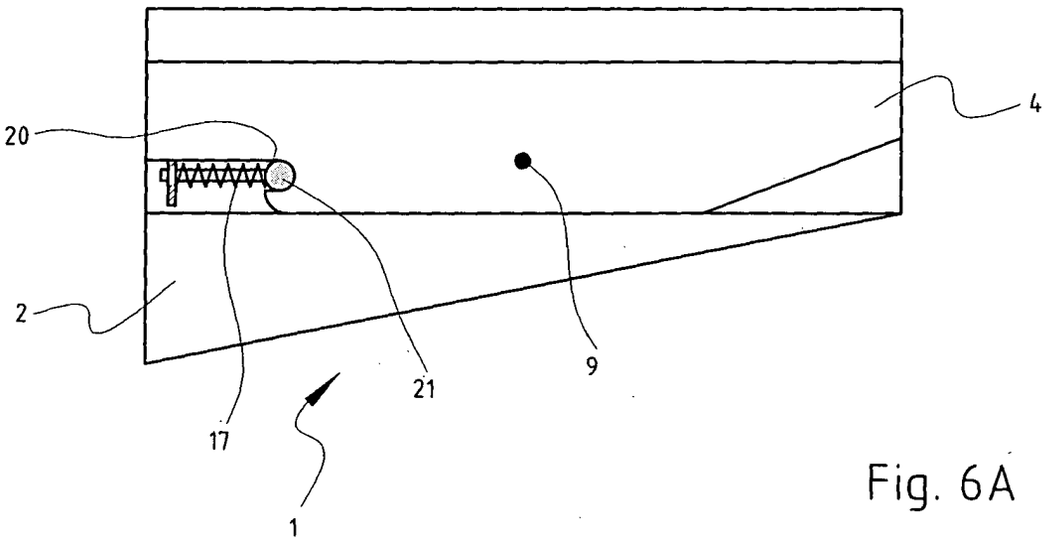

Fig. 6A

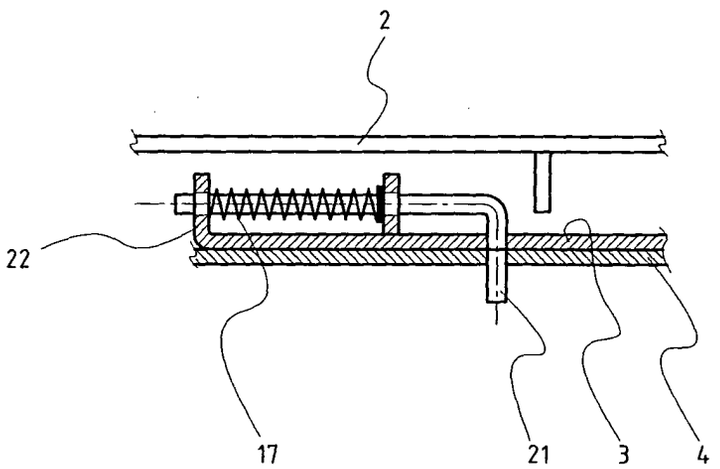

Fig. 6B

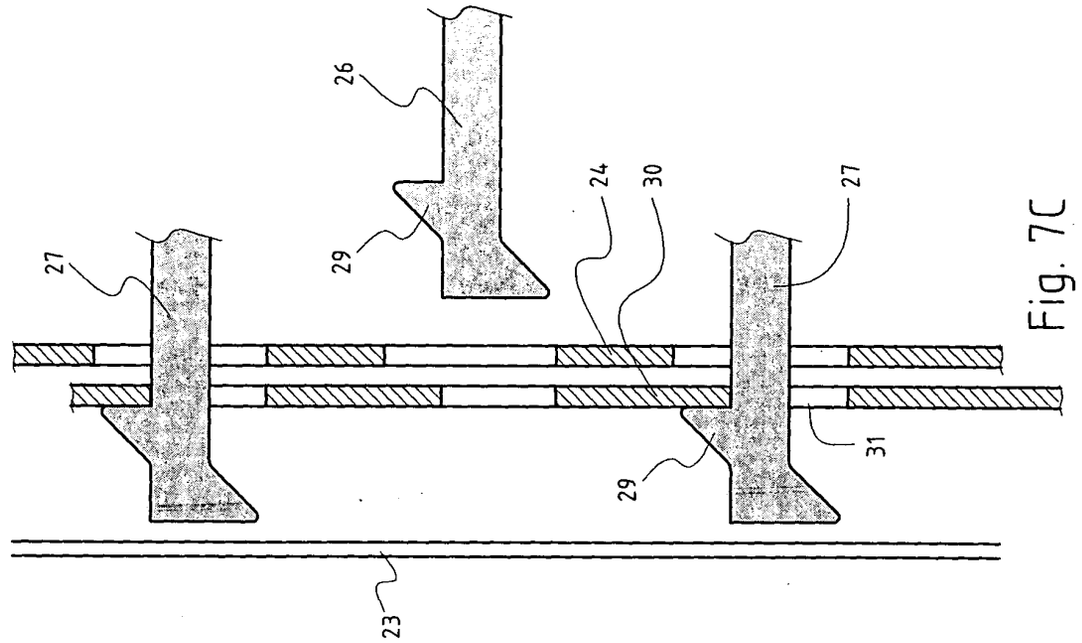

Fig. 7C

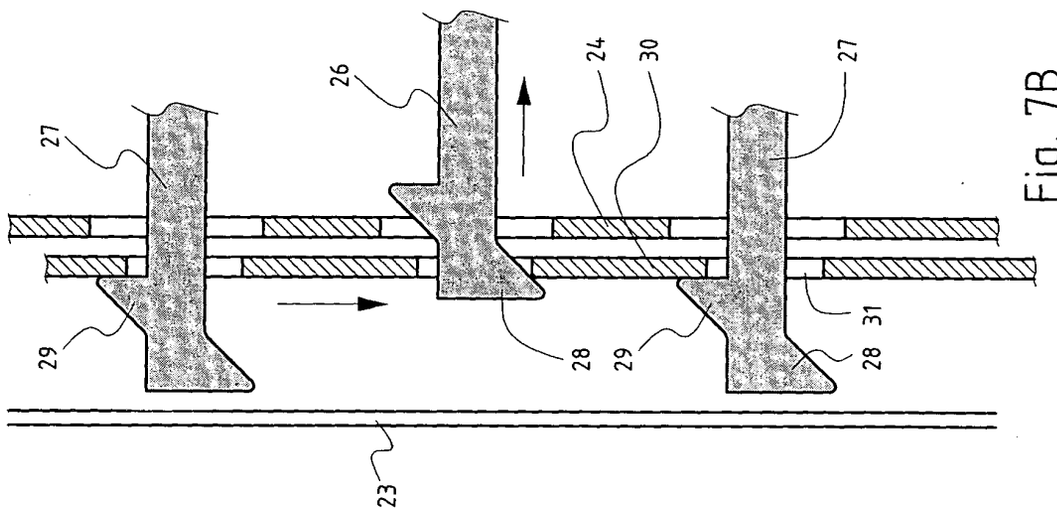

Fig. 7B

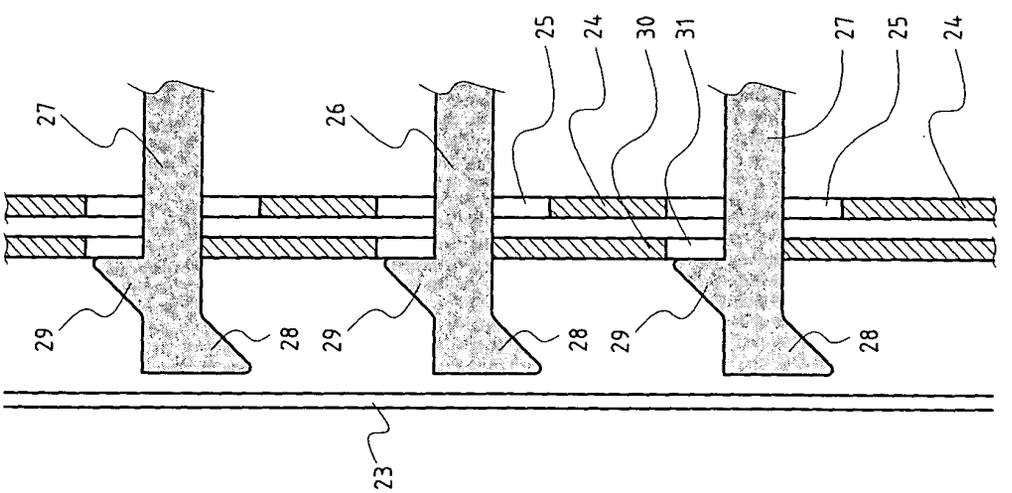

Fig. 7A

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 05 07 5372

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)
A	US 6 357 609 B1 (WHITE GARY L ET AL) 19 March 2002 (2002-03-19) * abstract; figures *	1-3	A47F5/00 A47F5/12 A47B46/00
A	US 2003/173876 A1 (FUJII KIYOSHI ET AL) 18 September 2003 (2003-09-18) * the whole document *	1-3	
A	EP 0 658 327 A (ROTHMANS TOBACCO COMPANY B V) 21 June 1995 (1995-06-21) * abstract; figures *	1-3	
A	GB 2 286 576 A (SIMMONS NIGEL STUART MURRAY) 23 August 1995 (1995-08-23) * abstract; figures *	1-3	

TECHNICAL FIELDS SEARCHED (Int.Cl.7)

A47F
A47B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	18 April 2005	Pineau, A

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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A : technological background
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ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 05 07 5372

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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18-04-2005

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 6357609 B1	19-03-2002	NONE	
US 2003173876 A1	18-09-2003	JP 2003265280 A	24-09-2003
EP 0658327 A	21-06-1995	BE 1007833 A3	31-10-1995
		DE 69410961 D1	16-07-1998
		DE 69410961 T2	24-12-1998
		EP 0658327 A1	21-06-1995
GB 2286576 A	23-08-1995	NONE	

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