



(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
18.08.2010 Bulletin 2010/33

(51) Int Cl.:
A47B 88/04 (2006.01)

(21) Application number: **10152933.7**

(22) Date of filing: **08.02.2010**

(84) Designated Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO SE SI SK SM TR
Designated Extension States:
AL BA RS

(72) Inventors:
• **Galassi, Mauro**
60020 POLVERIGI (AN) (IT)
• **Galassi, Matteo**
60020 POLVERIGI (AN) (IT)

(30) Priority: **12.02.2009 IT MC20090025**

(74) Representative: **Baldi, Claudio et al**
Ing. Claudio Baldi S.r.l.
Viale Cavallotti, 13
60035 Jesi (Ancona) (IT)

(71) Applicant: **Sige S.P.A.**
I-60020 Polverigi (IT)

(54) **Vertical structure for column cabinets**

(57) The present invention relates to a vertical structure used to support shelves or baskets (7), adapted to be mounted inside column cabinets along their depth,

characterised in that it uses an "L" shaped frame (T) as bearing element capable of sliding from inside to outside of the cabinet and vice versa.

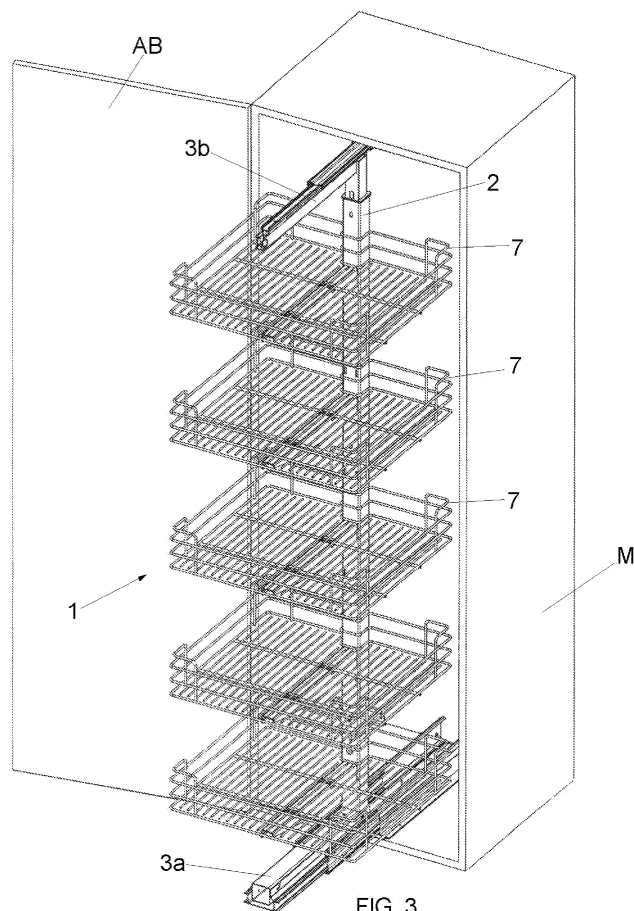


FIG. 3

Description

[0001] The present patent application for industrial invention relates to a vertical structure for column cabinets used to store objects of miscellaneous kind.

[0002] As it is known, column cabinets with tall and narrow geometry are widely used in the sector of modular kitchens, being designed to house a bearing structure to contain food products, pans or similar articles.

[0003] Generally, these bearing structures are of pull-out type, being capable of sliding from inside to outside of the cabinet in order to provide more comfortable conditions of use for the user, especially with reference to the operations required to collect or store the aforementioned objects.

[0004] So far, the most common type of vertical pull-out structures makes use of a pair of uprights as bearing elements, connected by two cross-pieces on the bottom and on top.

[0005] In this way a frame-shaped structure is obtained in which (in intermediate position between the two uprights) shelves and/or baskets designed to hold objects are mounted in horizontal position.

[0006] Such a traditional pull-out bearing structure is positioned in the centre of the internal compartment of the column cabinet, in a position in which the uprights of the frame-shaped bearing structure are arranged respectively towards the back and the front opening of the cabinet.

[0007] In consideration of the fact that such a similar structure must be pulled-out of the cabinet, the cabinet is provided on the lower and upper horizontal wall with rectilinear support and slide guides designed to be coupled with the cross-pieces of the frame-shaped bearing structure.

[0008] A simple tensile force exerted manually by the user is sufficient to make the vertical structure slide outside of the cabinet, whereas a corresponding thrust in opposite direction allows for reintroducing the same structure inside the cabinet.

[0009] Moreover, it must be said that a column cabinet designed to be equipped with such a traditional bearing structure can be alternatively provided with two different types of doors.

[0010] In fact, it can be provided either with a traditional door hinged in one of the vertical borders of the front opening or alternatively with a translating door joined to the pull-out vertical structure.

[0011] More precisely, a door of this type is designed to be fixed against the front upright of the frame-shaped structure in such a way to be exactly arranged at the height of the opening of the column cabinet when the bearing structure is in idle position, that is to say when it has completed the sliding movement towards the inside of the cabinet.

[0012] A critical aspect has been identified in such a traditional technology, which consists in the difficulties encountered by the user of a traditional pull-out structure

when collecting (and storing) objects from/on the shelves mounted between the uprights of the frame-shaped structure.

[0013] This is due to the fact that the collection and storage operations can be carried out only from the sides of each shelf, as easier frontal collection (or storage) is prevented by the presence of the front upright of the frame-shaped structure.

[0014] The patent application EP 1 820 422 discloses a vertical structure for cabinets comprising a rectangular bearing frame provided with two uprights, in which baskets are supported between the two uprights of the frame. This arrangement does not provide good access to baskets to pull them out.

[0015] The specific purpose of the present invention is to simplify the aforementioned technology in order to obtain a pull-out vertical structure that, in addition to being characterised by extremely simple construction, is capable of guaranteeing ideal access to the object-holding shelves.

[0016] In case of the new device of the invention, the collection and storage of objects is no longer carried out only from a lateral direction, but also from a more comfortable and advantageous frontal direction.

[0017] The inventive idea that has allowed achieving the aforementioned purposes has been to provide, for the first time, that the vertical frame designed to support shelves no longer has the traditional frame-shaped structure, being simply provided with a single upright connected on the bottom to the end of a cross-piece.

[0018] It can be said that the bearing structure has an L-shaped configuration, in which the lower cross-piece is designed to be coupled with a rectilinear support and slide guide mounted on the lower bottom wall of the column cabinet.

[0019] It must be said that the single upright is designed to support a series of horizontal panels in projecting position, which are in particular arranged in the space above the lower cross-piece and are consequently easy to access both from the sides and the front.

[0020] It is important to state that the new pull-out structure of the invention is suitable to be advantageously used both in association with column cabinets provided with hinged door and with those provided with translating door, as the latter can be in any case mounted "on board" the new pull-out structure. Moreover, it must be noted that the tubular upright can be associated on top with a second cross-piece (in perfect vertical alignment with the base cross-piece), which is in turn coupled with a rectilinear guide mounted on the inside of the upper horizontal wall of the cabinet.

[0021] Evidently, the presence of the second cross-piece gives higher stability to the vertical structure during the alternated travels.

[0022] The great versatility of the present invention is also represented by the capability to be mounted in "fixed" position inside the cabinet, thus excluding the possibility of alternate sliding; this advantageously elimi-

notes the need to provide holes or other support means on the sides of the cabinet.

[0023] In fact, also in this second assembly solution, the opening of the hinged door of the cabinet would provide easy access to the shelves mounted in projecting position on said upright.

[0024] For purposes of clarity, the description of the invention continues with reference to the enclosed drawings, which are intended for purposes of illustration only and not in a limiting sense, wherein:

- Fig. 1 is an axonometric view of the bearing frame of the pull-out vertical structure of the invention, already coupled with the column cabinet;
- Fig. 2 is the same as fig. 1, except for it shows the presence of projecting arms on the front of the bearing frame;
- Fig. 3 the same as fig. 2, except for it shows the presence of wire baskets mounted on said projecting arms;
- Fig. 4 is the same as fig. 3, except for it refers to an alternative coupling mode of the structure of the invention to the column cabinet;
- Fig. 5 is an enlarged axonometric view of one of said projecting arms associated with the pull-out structure of the invention;
- Fig. 6 is an axonometric exploded and enlarged view of a detail of fig. 5;
- Fig. 7 is an enlarged axonometric view of one of said baskets mounted on the pull-out structure of the invention;
- Figs. 8A and 8B are two cross-sectional views with the same transversal plane of the insert adopted in the support arms of the structure of the invention in order to stop the wire baskets;
- Fig. 9 is an axonometric view of an alternative assembly solution of the structure arranged in the position shown in figs. 1, 2 and 3;
- Fig. 10 is an axonometric view of an alternative assembly solution of the structure arranged in the position shown in fig. 4.

[0025] Referring to the above figures, the vertical structure of the invention (1) makes use, as bearing element, of a preferably L-shaped metal frame (T) formed of a single tubular upright (2) associated on the bottom with a cross-piece (3a); said frame (T) is designed to be mounted in the centre of a column cabinet (B) along its depth.

[0026] Referring to fig. 1, the base cross-piece (3a) is coupled with possibility of free sliding to a rectilinear guide (G1) mounted on the bottom wall of the column cabinet (M).

[0027] So the entire "L" shaped frame (T) can make alternated travels from inside to outside of the cabinet (M) and vice versa; in particular, Figs. 1, 2 and 3 show the frame in maximum extraction condition.

[0028] According to a preferred embodiment of the

present invention - which Figs. 1, 2 and 3 expressly refer to - the tubular upright (2) is associated on top with a second cross-piece (3b) that is in turn adapted to cooperate with a rectilinear guide (G2) mounted on the upper horizontal wall of the column cabinet (M).

[0029] The simultaneous coupling of the two cross-pieces (3a, 3b) with the rectilinear guides (G1, G2) guarantees higher stability of the entire vertical structure (1) during its alternated travels.

[0030] To increase the versatility of the invention and, more precisely, favour adjustability with respect to column cabinets of different heights, the upper cross-piece (3b) is welded to the end of a vertical bar (4) that is inserted and slides inside the tubular upright (2).

[0031] In view of the above it appears evident that the adequate selection of the position of the sliding bar (4) with respect to the upright (2) allows for adjusting, from time to time, the distance between the two cross-pieces (3a, 3b) and consequently adjusting - although by a few centimetres - the height of the frame (T) according to the height of the column cabinet (M) designed to receive it exactly.

[0032] Referring to fig. 5, the upright (2) is provided on the internal side, that is to say the side facing the same direction as the cross-piece (3a), with a series of side-by-side pairs of vertical slots (5) arranged at different heights.

[0033] Each pair of slots (5) is designed to exactly receive a pair of downward-facing hooks (6a) that protrude on the back of an arm (6) mounted in projecting position on the upright (2), as shown in fig. 2.

[0034] As shown in fig. 7 each of the projecting arms (6) is adapted to act as support for a rectangular wire basket (7) surrounded by a perimeter railing (70).

[0035] The same figure also shows that each basket (7) is provided, in the centre of its rear transversal border, with a vertical housing with basically square cross-section (S), adapted to be exactly matched with the corresponding section of the upright (2) to provide a sort of male-female coupling able to prevent undesired oscillations of the basket (7) with respect to the upright (2) and/or the support arm (6).

[0036] Figs. 5 and 6 show another important device provided to this end.

[0037] Each of the arms (6) is obtained with metal section with decreasing height from the back to the front end and provided with overturned-U cross-section.

[0038] Within each arm (6) two transversal notches (6b) are obtained along the entire width of the upper side of the same, being designed to exactly receive plastic moulded inserts (IS), which in turn are designed to provide stable fixing with the horizontal wall of the wire basket (7).

[0039] It must be noted that each of the inserts (IS) consists in a rectangular strip (8) defined by two longitudinal borders (81, 82) ending with rounded borders.

[0040] Each of the borders (81, 82) is provided with a pair of flexible tongues (83) ending on top with retention

teeth (84) that spontaneously tend to occupy, in idle position of the tongues (83), a position slightly projecting towards the outside of the border (81, 82), as shown in fig. 6.

[0041] When each of the inserts (IS) is inserted inside the notch (6b) from up down, the longitudinal borders of the latter interfere with the retention teeth (84) causing the inward flexion of the flexible tongues (83).

[0042] As soon as interference ceases - when the teeth (84) are brought to a lower height than the height of the longitudinal borders of the notch (6b) - the flexible tongues (83) instantaneously tend to recover their original position, in such a way that each pair of retention teeth (84) is immediately arranged under the longitudinal border of the notch (6b).

[0043] This condition guarantees that the entire insert (IS) cannot be removed freely from the notch (6b).

[0044] As shown in fig. 6, the two borders (81, 82) of each insert (IS) are provided with two vertical notches (85) in symmetrically opposite position.

Moreover, it must be said that the first (81) of the two longitudinal borders is provided on top, and for its entire length, with a horizontal element (86) oriented towards the opposite side (82) and having lower curved profile (86a) with downward concavity.

[0045] A channel (87) with upward concavity is obtained under the element (86), for the entire length of the upper side of the strip (8).

[0046] It can be said that the lower concave profile (86a) of the element (86) and the channel (87) define a C-shaped housing (90) in cooperation with the first border (81).

A catch (88) is obtained on the front of the opening of said housing (90), being the upper end of a lever with elastic return (89) that is hinged above the strip (8) by means of an oscillating arm (89a), practically acting as return spring; it being also provided that the lower end of the lever (89) protrudes under the strip (8) in such a way to be easily accessible for the user.

In particular, Fig. 8A shows the lever (89) in idle position, in which the catch (88) maintains a vertical position, raised with respect to the upper surface of the strip (8) and opposite to the opening of the C-shaped housing (90).

[0047] As shown in Fig. 8B, the same lever (89) occupies a rotated position when a force is exerted on it to impose a rotation on its lower end in the inside-outside direction indicated by the arrow (IE).

[0048] When the lever (89) is brought in "operational" position, the catch (88) is rotated downwards by approximately 90°, thus having a basically horizontal position above the strip (8) and freeing the opening of the C-shaped housing (90).

[0049] As regards the cooperation modes between each of the inserts (IS) and the bottom wall of a wired basket (7), it must be noted as follows.

[0050] First of all, in each basket (7), the wired bottom wall is obtained by means of a regularly spaced longitu-

dinal series of metal rods (7a) welded above two transversal rods (7b) with higher cross-section.

[0051] When the basket (7) is positioned on the bearing arm (6), the two transversal rods (7b) must be forced inside the inserts (IS) already inserted in the bearing arm (6).

[0052] In particular, a section of each transversal rod (7b) is adapted to be exactly engaged in the C-shaped housing (90) of the insert (IS), as shown in Figs. 8A and 8B.

[0053] The insertion is also favoured by the fact that the interference exerted by the rod (7b) on the catch (88) from up down favours the outward rotation of the lever (89) - in the condition shown in fig. 8B - that brings the catch (88) in horizontal position and frees the opening of the C-shaped housing (90).

[0054] Considering that the lever (89) is with elastic return, it appears evident that the same - once the interference of the rod (7b) against the catch (88) has ceased - returns spontaneously and instantaneously in idle position (shown in fig. 8A) in which the catch (88) is brought again opposite to the opening of the C-shaped housing (90).

[0055] It appears evident that the second extraction of the rod (7b) from the housing (90) can be made only after bringing the lever (89) in operational position (shown in fig. 8B), thus eliminating the obstacle caused by the position of the catch (88) in front of the opening of the C-shaped housing (90).

[0056] A similar assembly of the basket (7) also involves that a section of the longitudinal rods (7a) is exactly inserted into the two notches (85) obtained in symmetrically opposite position on the borders (81, 82) of the insert (IS).

[0057] Attention is now drawn on a comparative examination of Figs. 3 and 4.

[0058] Fig. 3 shows a column cabinet provided with hinged door (AB), whereas Fig. 4 shows a column cabinet provided with translating door (AT) adapted to be mounted on board the new structure of the invention (1).

[0059] The great versatility of the invention can be appreciated, being simply provided with an L-shaped bearing frame and able - just like a more complex structure provided with a traditional frame-shaped structure - to advantageously cooperate both with cabinets with hinged door and cabinets with translating door.

[0060] Referring to fig. 3, in a cabinet (M) with hinged door, the vertical structure of the invention (1) is mounted with cross-pieces (3a, 3b) and baskets (7) directed towards the front of the cabinet.

[0061] Referring to fig. 4, in a cabinet with translating door, the position of the vertical structure of the invention (1) must be inverted in such a way that cross-pieces (and baskets) are directed towards the back of the cabinet.

[0062] In this way the upright (2) of the vertical structure (1) occupies the closest position to the opening of the column cabinet (M); so, its external side (that is to say the one opposite to the side designed to fix the baskets)

can be used to fix a translating door (AT).

[0063] To do it, the only necessary operation is to provide this side of the upright (2) with horizontal fixing brackets (9).

[0064] Fig. 9 shows an alternative assembly solution of the L-shaped frame (T) in which the vertical bar (40) inserted into the upper end of the upright (2) is connected, with interposition of a horizontal arm (40a), to a lateral cross-piece (3c) coupled with a rectilinear guide (G3) mounted inside one of the sides of the column cabinet (M).

[0065] Evidently, also the lateral cross-piece (3c) is designed to additionally balance the alternated travels of the L-shaped frame (T) because of its cooperation with the rectilinear guide (G3).

[0066] Finally, Fig. 10 shows the adoption of the lateral cross-piece (3c) also when the vertical structure of the invention (1) is arranged in opposite direction, that is to say with the base cross-piece (3a) facing the back of the column cabinet (M) in case of assembly solution with translating door (AT).

[0067] It is reiterated that the vertical structure of the invention (1) can be inserted inside the cabinet (M) also in fixed position, without the possibility of making alternated travels.

[0068] In such a case the upright (2) must be positioned and fixed towards the back of the cabinet (M), whereas the lower cross-piece (3a), which is in any case fixed to the bottom wall of the cabinet, must be directed towards the opening of the cabinet (M).

[0069] In such a way, also the baskets (7) are faced towards the opening of the cabinet (M), that is to say in a position in which they can be directly and easily reached by the user to collect or store objects.

[0070] Finally, it must be noted that the baskets (7) designed to be mounted in projecting position with respect to the upright (2) can be also made according to different modes compared to the enclosed figures.

[0071] Consequently, not also in a wired configuration obtained with metal wire (or rods), but also glass, plastic or wood, with the only condition to provide, in such a case, suitable stop and stabilization means on the front of the upright (2).

Claims

1. Vertical structure for cabinets **characterised in that** it comprises:

- a bearing frame (T), and

one or more baskets (7) supported by said bearing frame (T),

characterised in that

said bearing frame (T) has an L shape and is composed of an upright (2) connected on the bottom with the end of a cross-piece (3a), and

said baskets (7) are supported in projecting position by the upright (2), above the said base cross-piece (3a).

2. Vertical structure according to claim 1, **characterised in that** each basket (7) has a structure made of metal wire (or rod), in which the bottom wall, surrounded by a perimeter railing (70), is composed of a regularly-spaced longitudinal series of thin metal rods (7a) that are welded above the two transversal metal rods (7b) with higher cross-section.
3. Vertical structure according to claim 1, **characterised in that** the baskets (7) are arranged in projecting position with respect to the upright (2), being supported by lower horizontal arms (6) directly fixed to the upright (2).
4. Vertical structure according to claim 3, **characterised in that** each horizontal arm (6), which is provided with decreasing height from the rear end to the front end and has a basically overturned U-shaped cross-section, is provided on the back with one or more downward-facing hooks (6a) designed to be securely engaged inside corresponding slots (5) provided on the said upright (2).
5. Vertical structure according to the above claims, **characterised in that** each arm (6) is provided on top with two transversal notches (6b) designed to exactly and securely receive plastic moulded inserts (IS) to obtain the stable connection with the iron rods (7a, 7b) of the bottom wall of the wire baskets (7).
6. Vertical structure according to claim 5, **characterised in that** each plastic moulded insert (IS) comprises:
 - a basically rectangular strip (8) defined by two longitudinal borders (81, 82) provided with corresponding vertical pairs of elastically flexible tongues (83) ending on top with retention teeth (84) designed to spontaneously maintain, when the flexible tongues (83) are in idle position, a slightly protruding position towards the outside of the border (81, 82)
 - an element (86) that protrudes inwards, and horizontally, from the top of the first (81) of the two longitudinal borders, and is provided with lower curved profile (86a) with downward concavity, arranged above a small channel (87) that extends along the entire length of the strip (8); it being provided that the curved profile (86a) of the element (86) and the small channel (87) define, with the cooperation of the first longitudinal border (81), a basically C-shaped housing (90) designed to exactly receive a section of one of the transversal rods (7b) of the bottom wall of a

wired basket (7)

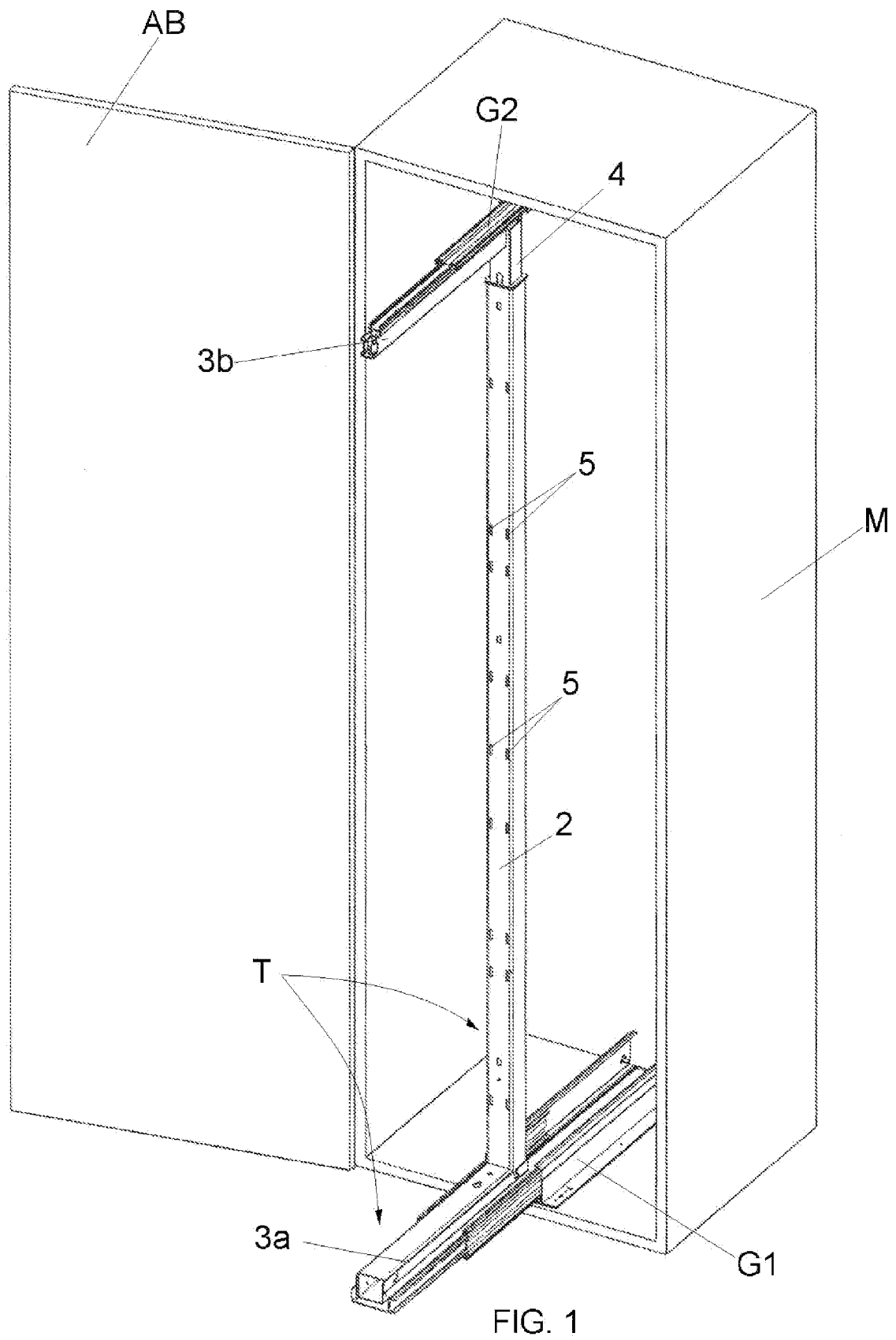
- a retention catch (88) situated in front of the opening of the C-shaped housing (90), which basically consists in the upper end of a lever with elastic return (89) that crosses the strip (8), in such a way that the opposite end protrudes under the strip (8), it being also provided that the lever (89) is hinged above the strip (8) by means of a suitable oscillating arm (89a) that allows it to rotate from idle position, in which the upper catch (88) is in basically vertical position in front of the C-shaped housing (90), to operational position, in which the upper catch (88) is in horizontal position, basically flush to the upper surface of the strip (8);

- two vertical notches (85) obtained in symmetrically opposite positions on the two longitudinal borders (81, 82), designed to exactly receive corresponding sections of one of the longitudinal rods (7a) of the bottom wall of a wired basket (7).

cross-piece (3c) is designed to cooperate with a corresponding rectilinear guide (G3) mounted on the side of the cabinet (M).

7. Vertical structure according to one or more of the above claims, **characterised in that** the base cross-piece (3a) is designed to cooperate with a rectilinear guide (G1) mounted on the bottom wall of the cabinet (M), in such a way to allow the entire structure (1) to make alternated travels with respect to the cabinet (M) from inside to outside and vice versa. 25
8. Vertical structure according to one or more of claims 1 to 6, **characterised in that** the upright (2) is provided on top with a second cross-piece (3b) arranged in perfectly vertical aligned position with the base cross-piece (3a) and designed to be coupled with the upper horizontal wall of the cabinet (M). 30 35
9. Vertical structure according to claim 8, **characterised in that** the second cross-piece (3b) is arranged on top of the upright (2) with the interposition of a bar (4) inserted inside the upper end of the upright (2), with possibility of free sliding. 40
10. Vertical structure according to one or more of the above claims, **characterised in that** the cross-piece (3b) situated on top of the upright (2) is designed to cooperate with a corresponding rectilinear guide (G2) mounted on the upper horizontal wall of the cabinet (M). 45
11. Vertical structure according to one or more of claims 1 to 6, **characterised in that** a bar (40) is inserted in the upper end of the upright (2) and connected, by means of an intermediate horizontal arm (40a), to a lateral cross-piece (3c) mounted in internal position on one side of the cabinet (M). 50 55
12. Vertical structure according to one or more of the above claims, **characterised in that** the lateral

- 5 13. Vertical structure according to one or more of the above claims, **characterised in that** the upright (2) is provided, on the side opposite the side from which the baskets (7) protrude, with one or more horizontal brackets (9), designed to fix a translating door (AT) when the entire vertical structure (1) is mounted with possibility of making alternated sliding travels inside the cabinet (M) with the base cross-piece (3a) facing the back of the cabinet (M). 10
- 15 14. Vertical structure according to one or more of the above claims, **characterised in that** each basket (7) is provided, in central position on the rear border, with a housing (S) designed to exactly receive a section of the upright (2). 20



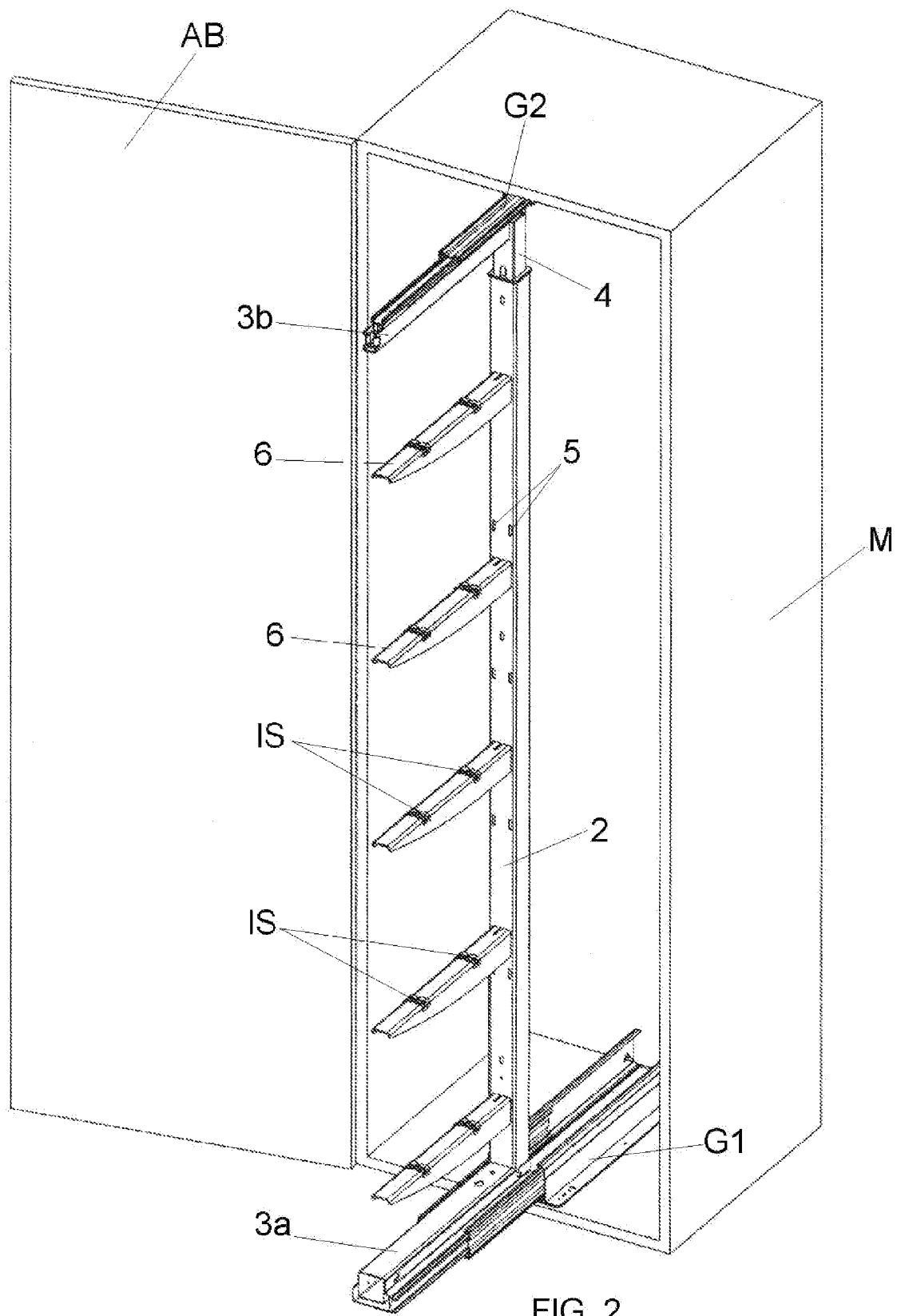
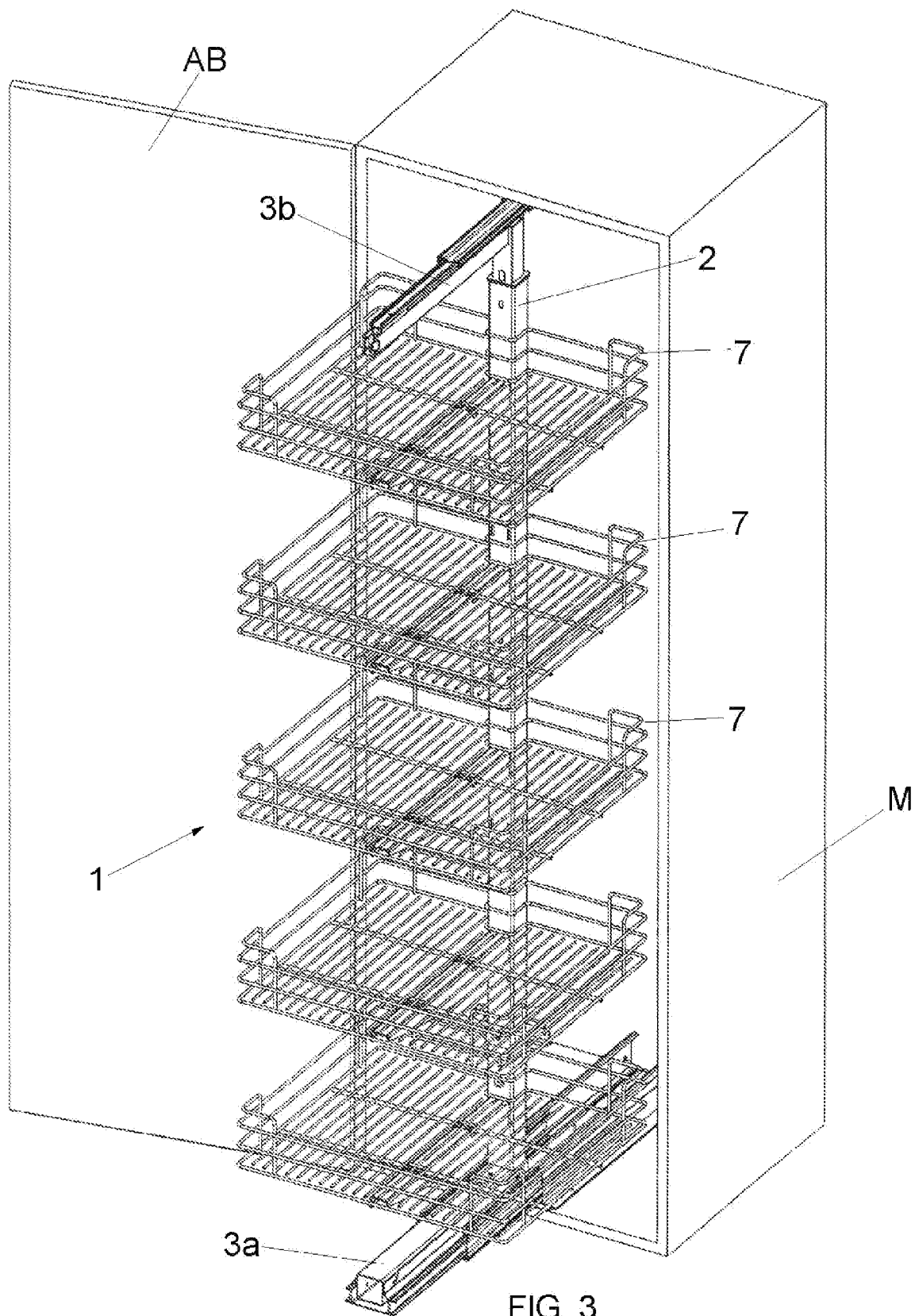
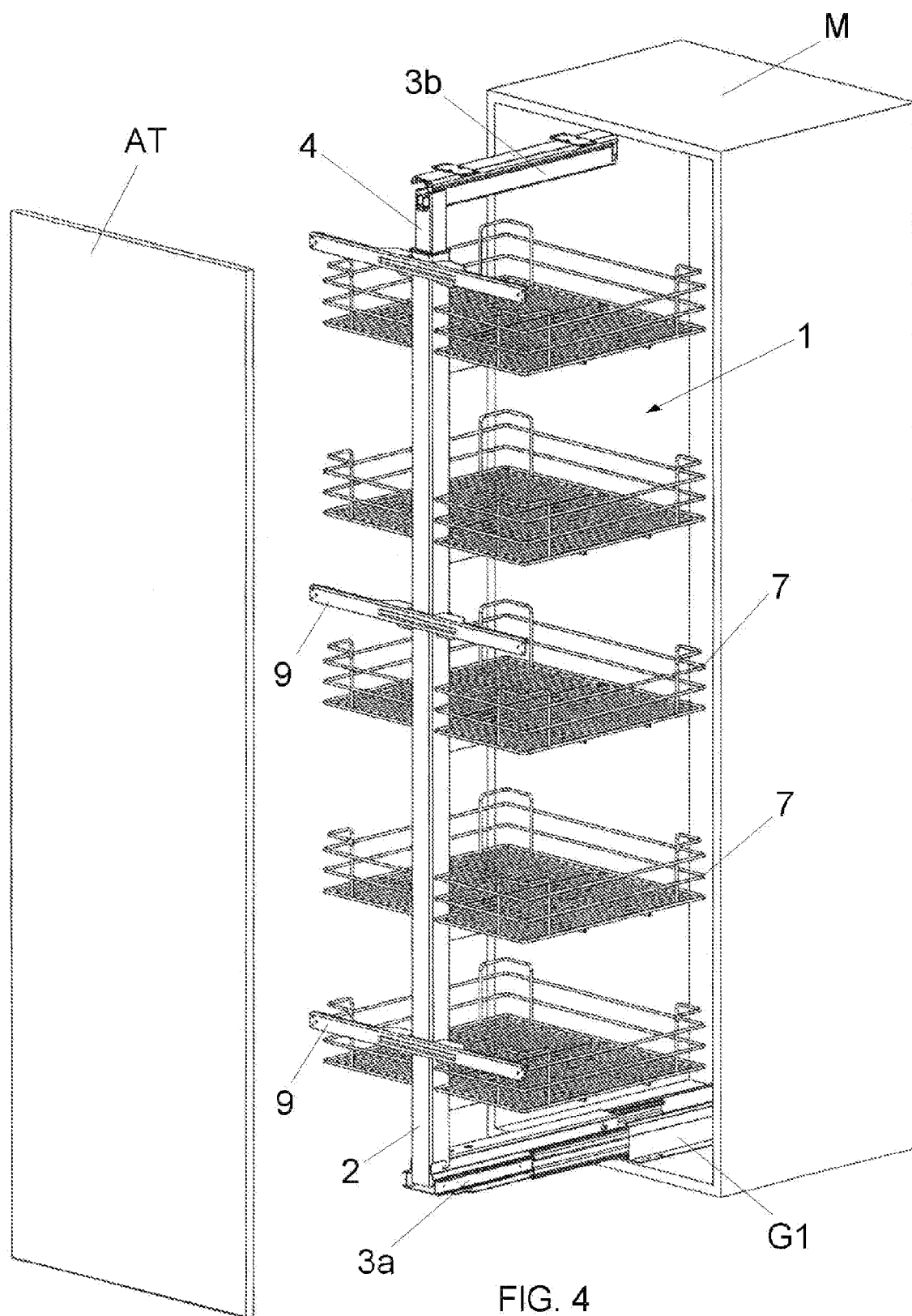


FIG. 2





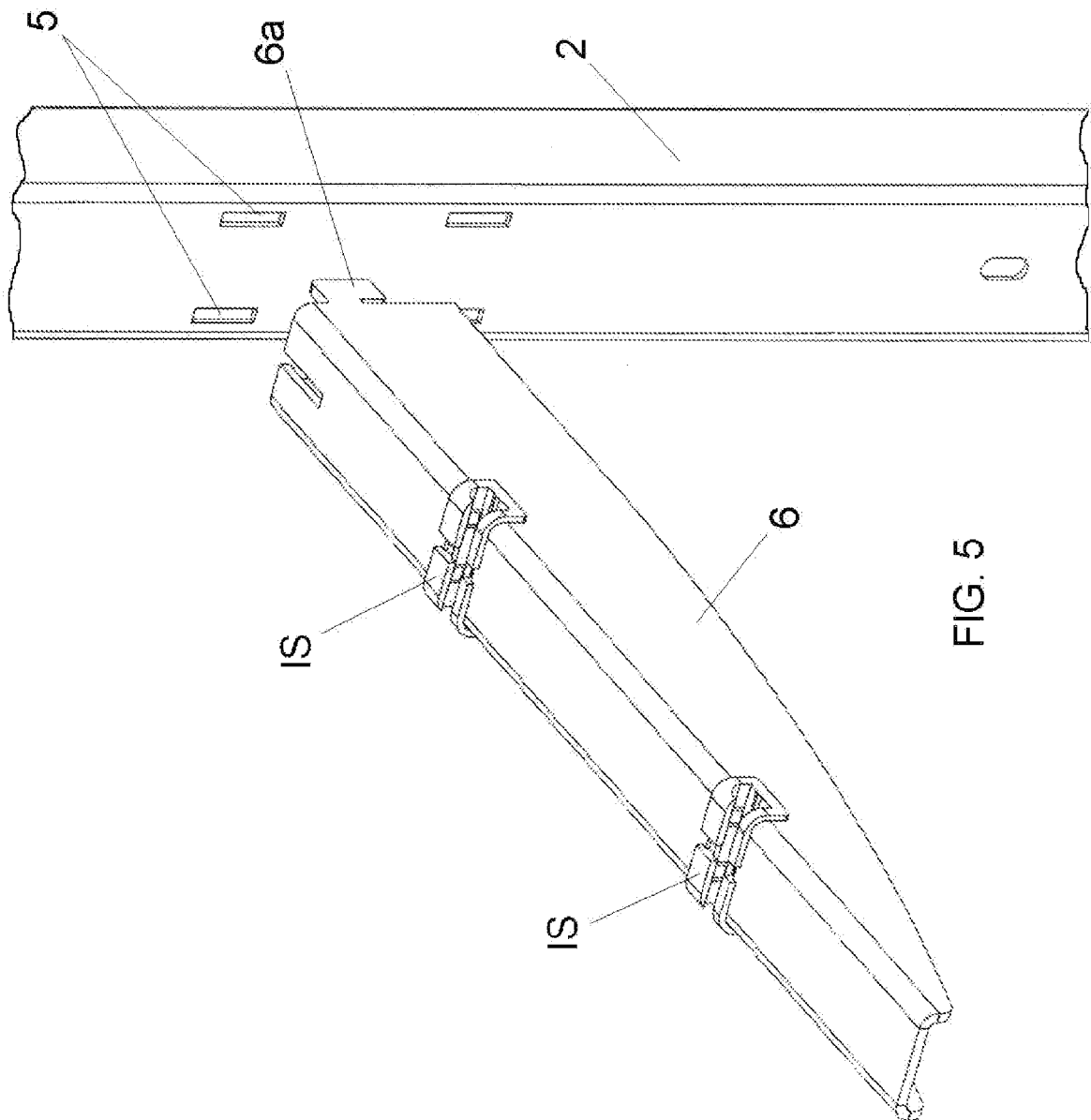


FIG. 5

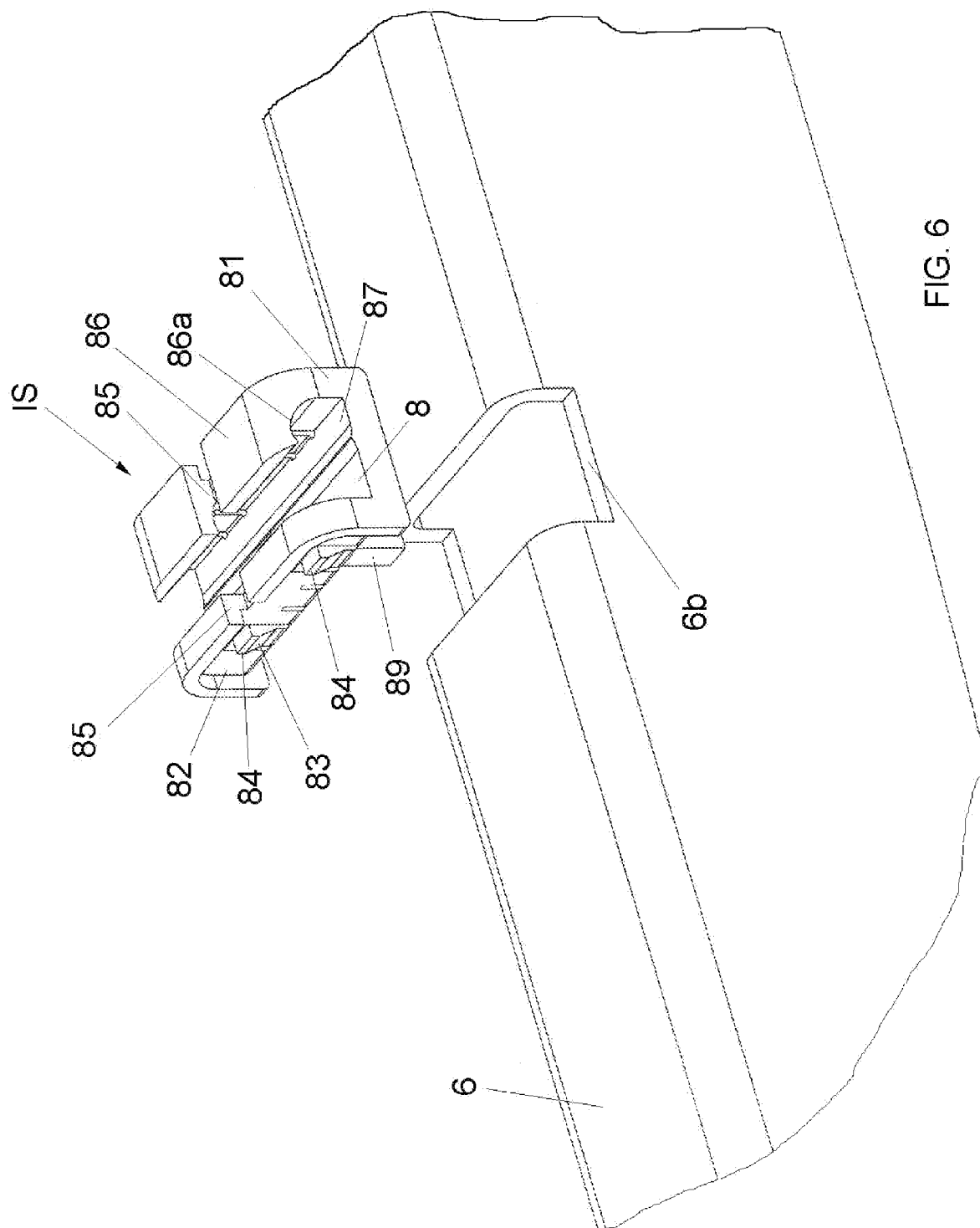
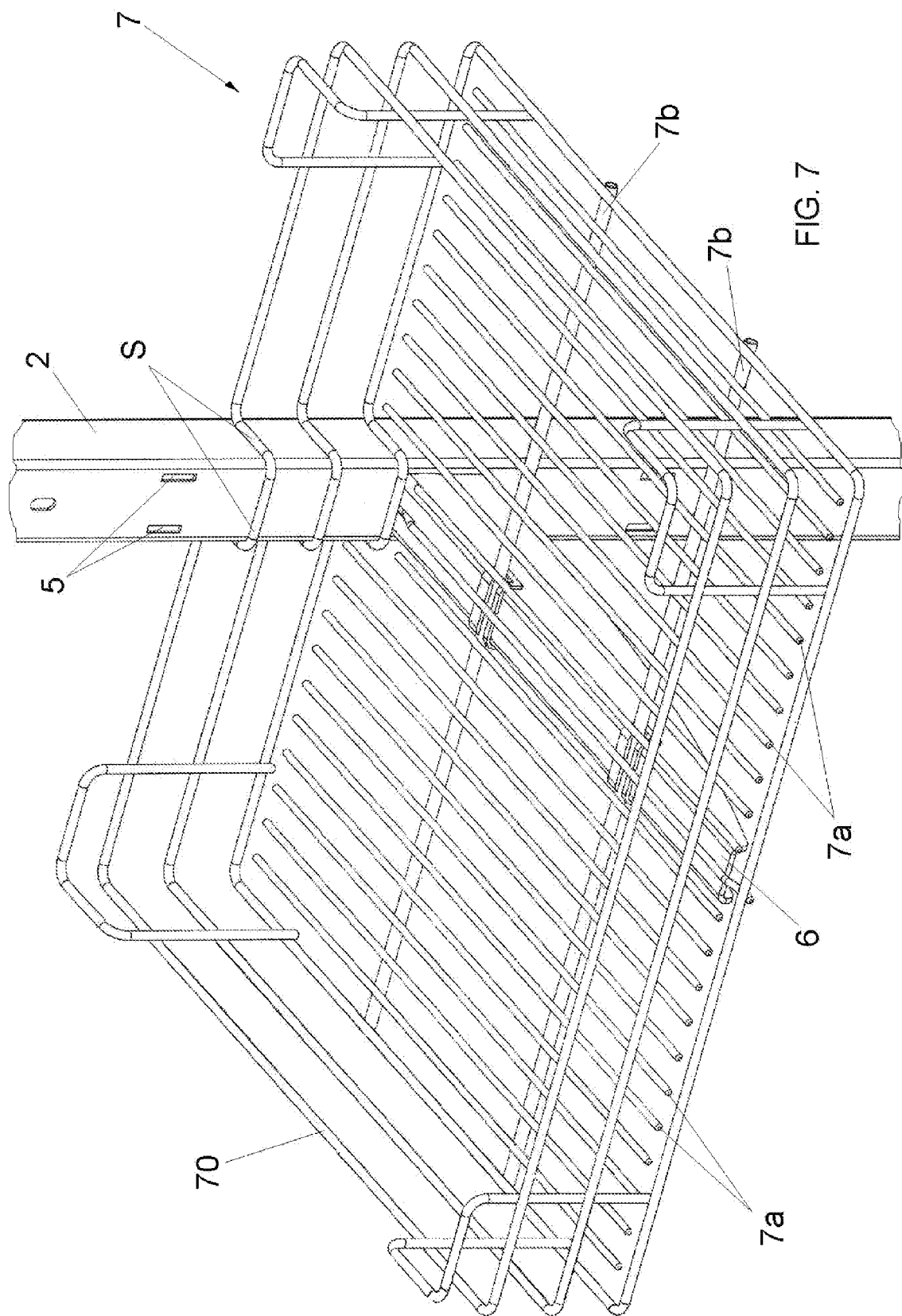


FIG. 6



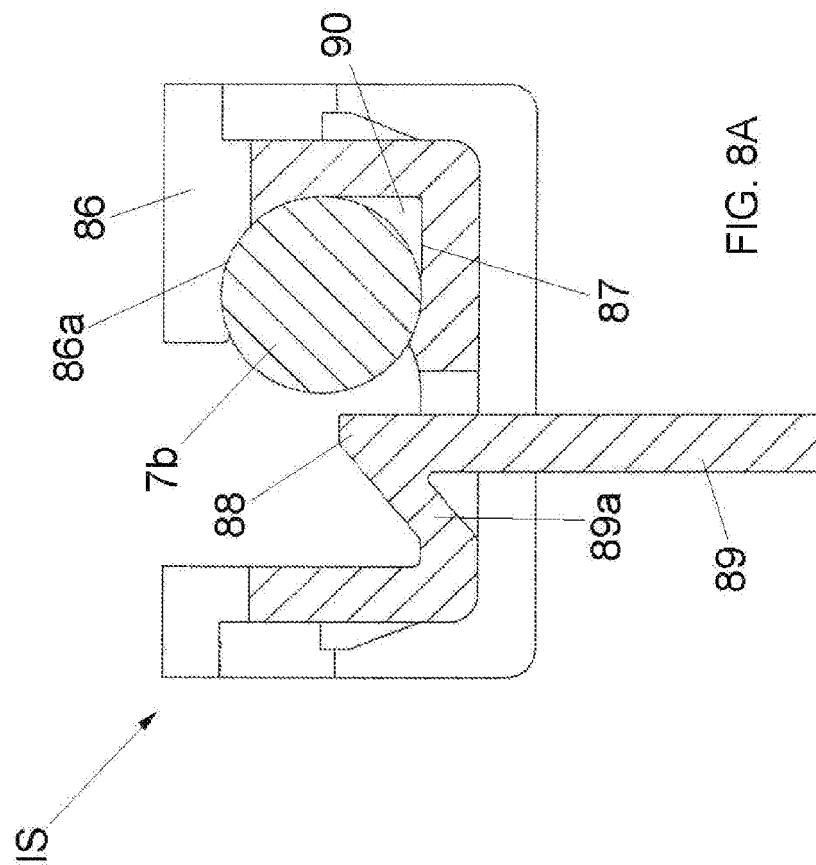


FIG. 8A

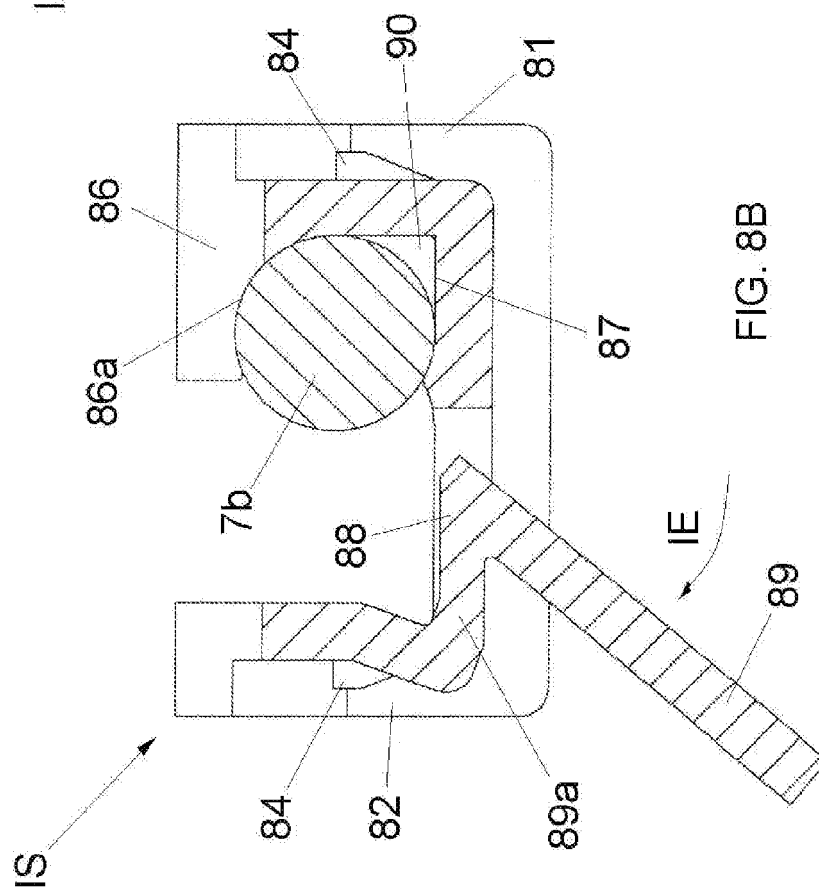
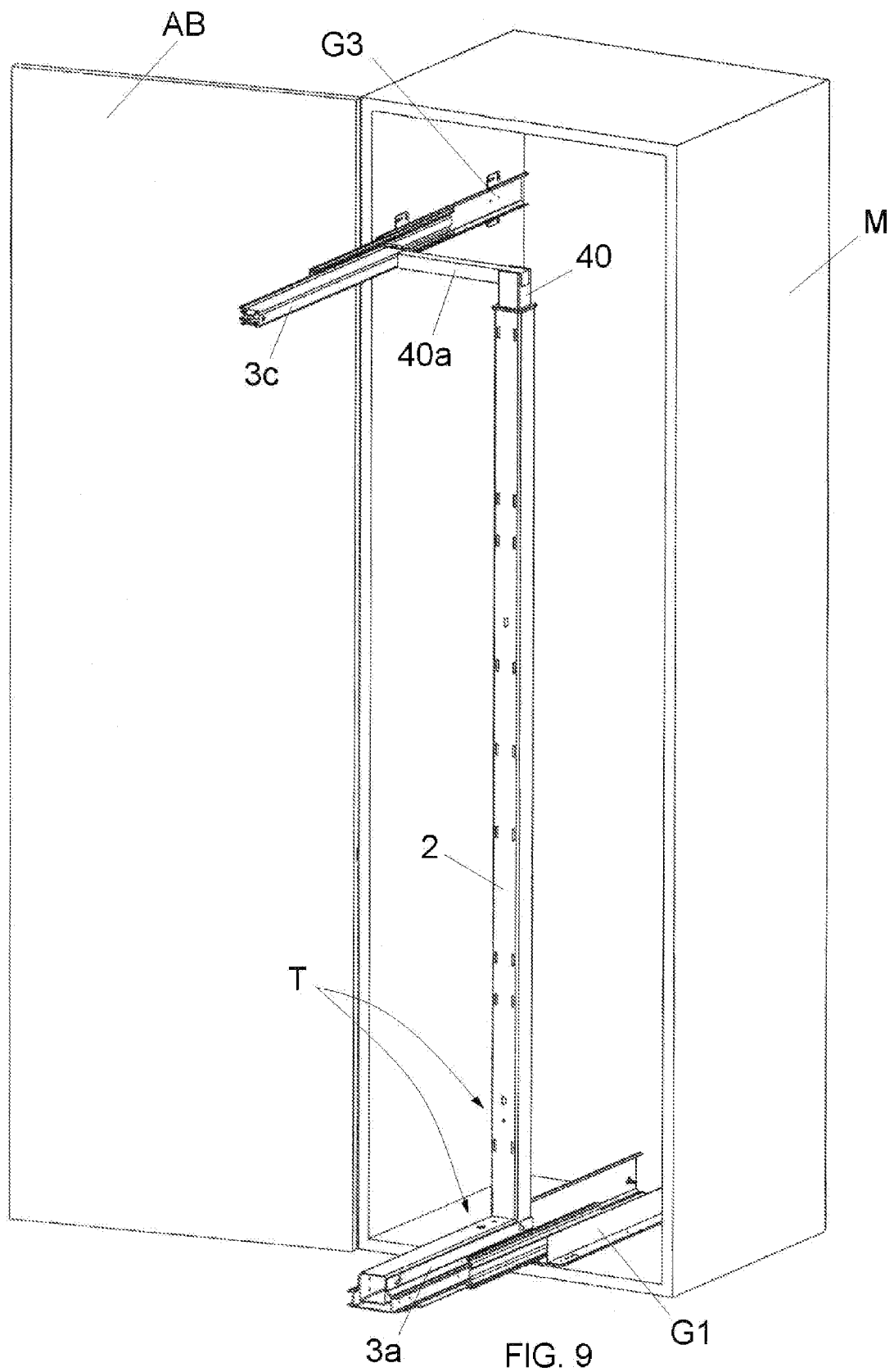


FIG. 8B



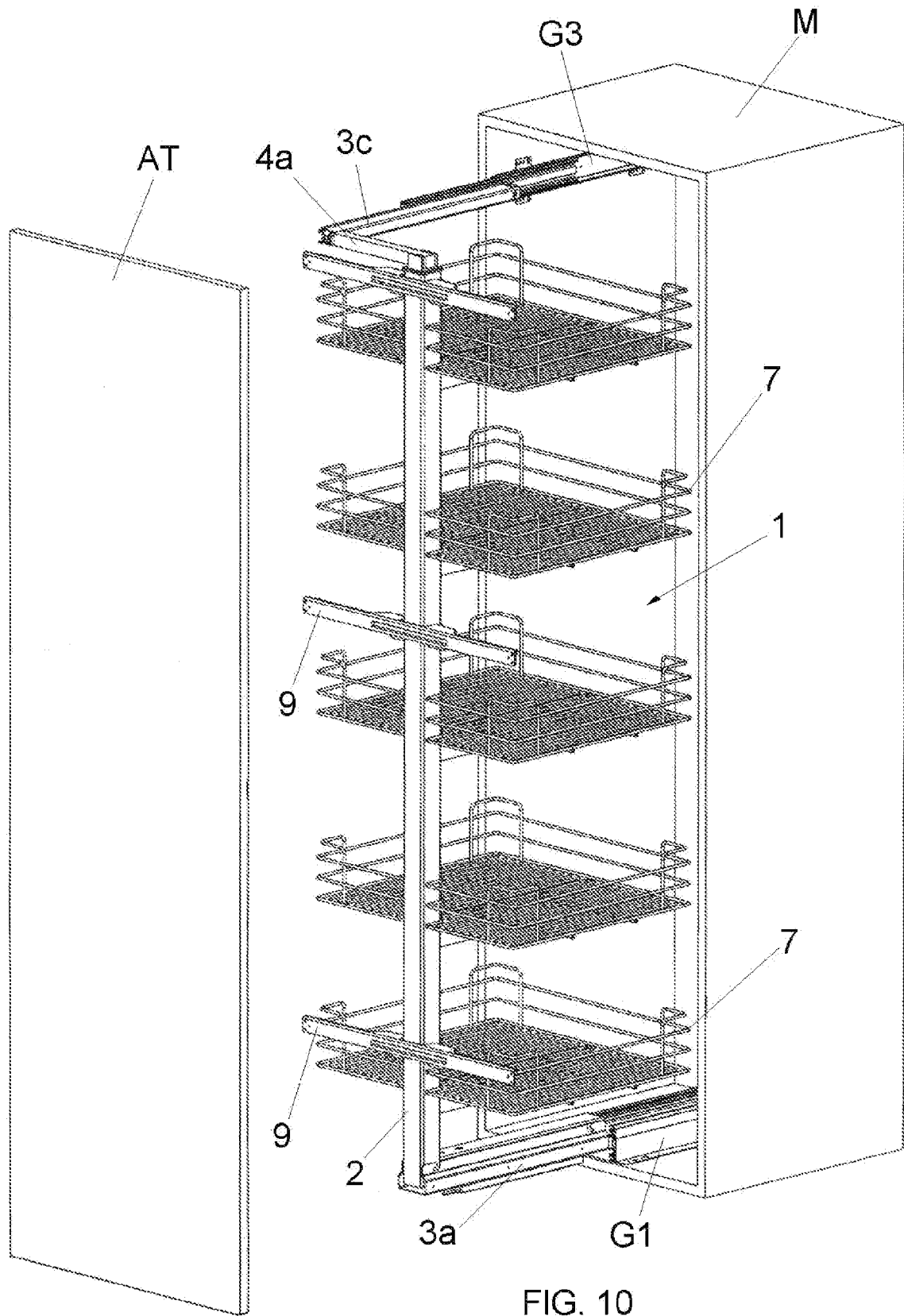


FIG. 10



EUROPEAN SEARCH REPORT

Application Number
EP 10 15 2933

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	EP 1 661 491 A1 (FULTERER GMBH [AT]) 31 May 2006 (2006-05-31)	1,2,7-14	INV. A47B88/04
A	* paragraph [0012] - paragraph [0034]; figures 1-12 *	3-6	

X	EP 1 820 422 A1 (FULTERER GMBH [AT]) 22 August 2007 (2007-08-22)	1,2,7-14	
A	* paragraph [0010] - paragraph [0038]; figures 1-9 *	3-6	

X	EP 1 060 692 A1 (FULTERER GMBH [AT]) 20 December 2000 (2000-12-20)	1,2,7-14	
A	* paragraph [0009] - paragraph [0016]; figures 1-6 *	3-6	

The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 9 June 2010	Examiner Klintebäck, Daniel
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

 1
EPO FORM 1503 03 82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 10 15 2933

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
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

09-06-2010

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 1661491 A1	31-05-2006	AT 366532 T	15-08-2007
		AT 501147 A4	15-07-2006
		ES 2289635 T3	01-02-2008
		PT 1661491 E	12-09-2007
EP 1820422 A1	22-08-2007	AT 503010 A4	15-07-2007
EP 1060692 A1	20-12-2000	AT 411132 B	27-10-2003

REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- EP 1820422 A [0014]