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(54) **Opening and closing device for suspended cabinets and the like**

Öffnungs- und Schliessvorrichtung für aufgehängte Schränke und dergleiche

Dispositif d'ouverture et de fermeture pour armoires suspendues et similaires

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**FR-A- 1 577 810**

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## Description

### BACKGROUND OF THE INVENTION

[0001] The present invention relates to an opening and closing device, in particular for suspended cabinets and the like.

[0002] Suspended cabinets, which are mainly used for kitchen furniture arrangement, but also in other rooms in which it is desired to have a free under region, for example for providing a working surface, are already known.

[0003] Said suspended cabinets can comprise either laterally hinged wings or tilting wings.

[0004] Tilting wings, as is known, provide the advantage that they do not obstruct the front part of the suspended cabinet, as the tilting wings are opened. However, they are also affected by some drawbacks.

[0005] Actually, a main drawback, for a user of small height, is the difficulty of opening and closing the tilting wing of the cabinet.

[0006] A further drawback, for users of a comparatively high height, is that the wing may impact against the head of the user as the tilting wing is brought to its closing position.

[0007] The document FR 1 577 810 discloses a hanging cabinet with a front surface closed by two closing wings including horizontal axis hinges associated with a driving beverage for tilting upwardly a wing and downwardly the other wing.

### SUMMARY OF THE INVENTION

[0008] Accordingly, the aim of the present invention is to provide an opening and closing device, for suspended cabinets and the like, which solves the above mentioned problems or drawbacks of the prior art.

[0009] Within the scope of the above mentioned aim, a main object of the invention is to provide such an opening and closing device which can be operated in a very simple manner.

[0010] Another object of the present invention is to provide such an opening and closing device which can be easily associated with existing suspended cabinet constructions.

[0011] Another object of the present invention is to provide such an opening and closing device which have a small size, so as not to negatively affect the holding capability of the cabinet.

[0012] Yet another object of the present invention is to provide such an opening and closing device which has very good aesthetic properties and, in particular, affording the possibility of concealing to view its mechanical parts, while providing aesthetically patterned opening wings.

[0013] According to one aspect of the present invention, the above mentioned aim and objects, as well as yet other objects, which will become more apparent hereinafter, are achieved by an opening and closing device,

for suspended cabinets and the like, according to claim 1.

[0014] The tilting wing and slidable wing are pivoted to one another by a pivoting mechanism, thereby, to a translatory movement of the slidable wing will correspond a tilting or swinging movement of the tilting wing, to define at least a closed position and at least an open position of said wings.

### BRIEF DESCRIPTION OF THE DRAWINGS

[0015] Further characteristics and advantages of the present invention will become more apparent hereinafter from the following detailed disclosure of a preferred, though not exclusive, embodiment of the invention, which is illustrated, by way of an indicative, but not limitative, example in the accompanying drawings, where:

Figure 1 is a perspective view of a suspended cabinet including the opening and closing device according to the invention, being shown in a closed position thereof;

Figure 2 is a view similar to figure 1, but showing the suspended cabinet including the subject opening and closing device, in an open position thereof;

Figure 3 is a cross-sectional elevation view illustrating the opening and closing device according to the present invention, in a closed position thereof;

Figure 4 is a view similar to figure 3, but showing the subject device during its opening operation;

Figure 5 shows the subject device in its fully opened position and ready to be reclosed again;

Figure 6 is a partially exploded perspective view showing the pivoting mechanism for the wings of the device according to the present invention;

Figure 7 is a further cross-sectional elevation view showing that same opening and closing device, as adjusted for a less height of the furniture piece;

Figure 8 is a view similar to figure 7, but showing the subject opening and closing device adjusted for a middle height of the furniture piece; and

Figure 9 is a view similar to figure 8, but showing the subject opening and closing device, as adjusted for a larger height of the furniture piece.

### DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0016] With reference to the number references of the above mentioned figures, the opening and closing device, according to the invention, which has been generally indicated by the reference number 1, comprises a tilting or swinging wing 2, cooperating with a slidable wing 3 for closing a front opening 4 of a suspended cabinet, including two sidewalls 5, a bottom panel 6, a top panel 7 and a bottom proper 24.

[0017] More specifically, the tilting or swinging wing 2 and slidable wing 3 are pivoted to one another by a pivoting or hinging mechanism, generally indicated by the

reference number 8, which is applied either to one or both said sidewalls 5.

[0018] The pivoting device 8 operates so that, as the slidable wing 3 is raised and lowered, also the tilting wing 2 will be respectively raised and lowered.

[0019] Said pivoting mechanism 8 comprises a vertical bracket 9, having a top end portion thereof hinged to a hinge 13, supporting said tilting wing 2, and having its bottom end portion coupled to a supporting bracket 14 for said slidable wing 3.

[0020] The swinging or tilting wing 2, in addition to being supported by the articulated assembly 13, is also pivoted to the furniture construction, through a top hinge 18, which is preferably fixed inside the top panel 7.

[0021] The vertical bracket 9 can slide along a guide 10 included in a box-like body 11 which can be associated with the sidewall 5 and including a protective cover element 12.

[0022] The vertical bracket 9 has an adjustable length, thereby to allow the articulation mechanism to be easily fitted to furniture pieces of different heights.

[0023] To that end, the vertical bracket comprises a top portion 15 and a bottom portion 16, each of which includes a perforated portion, so as to adjust the overall length of the bracket 9, by arranging at a different spacing the perforated portions onto one another and by fixing them by bolts, rivets or the like, engaged through holes 17 as suitably formed through said two portions.

[0024] The opening and closing device comprises moreover dampening means, adapted to operate as end of stroke dampening elements, both for the opening and for the closing movements of the wings.

[0025] More specifically, said dampening means comprises a first piston dampening device 19 and a second piston dampening device 20, which are assembled in opposition to one another on a supporting block 21 coupled to the body 11 of the device in parallel to a guide 10 at a middle position, thereby they are respectively and alternatively engaged by the top portion 15 and supporting bracket 14.

[0026] Figure 5 shows a fully opened position of the device, and also clearly shows the operation of the first dampening device 19.

[0027] Figure 3 shows the fully closed position of the device, and shows moreover the operation of the second dampening device 20.

[0028] To reduce the force necessary for operating the device, the articulation 13 comprises a return spring 22 which is so calibrated as to operate against the weight of the swinging or tilting wing 2.

[0029] To allow an easy gripping and for properly operating the slidable wing 3, a handle or other suitable gripping member 23 is moreover provided.

[0030] The opening and closing device according to the present invention operates in a very simple manner.

[0031] In fact, it is sufficient to downward pull the slidable wing 3 to open said slidable wing and causing the tilting wing 2 to be raised, without any effort by the user,

owing to the provision of the spring 22.

[0032] The first dampening device 19 will smoothly interrupt the opening stroke or displacement of the device.

5 [0033] For closing the device, it is sufficient to raise the slidable wing, thereby causing the tilting wing to be automatically lowered.

[0034] The second dampening device will prevent any closure impact from occurring.

10 [0035] It has been found that the invention fully achieves the intended aim and objects.

[0036] In fact, the invention provides an opening and closing device allowing to easily open a suspended cabinet by a mixed type of opening and closing system, i.e. including a slidable wing and a tilting wing, thereby combining the advantages provided by the tilting wing with the easy opening of the slidable wing.

[0037] In practicing the invention, the used materials, as well as the contingent size and shapes, can be any, depending on requirements.

## Claims

1. An opening and closing device (1) for a suspended cabinet and the like, said device comprises at least a tilting wing (2), to be articulated to said cabinet by a top hinge (18), cooperating with a further wing (3) for closing a front opening (4) of said cabinet, said tilting wing (2) and further wing (3) are pivoted to one another by a pivoting mechanism (8) **characterized in that** said further wing (3) is a sliding wing (3) and that said pivoting mechanism (8) comprises a vertical bracket (9) having a top end portion pivoted to a hinge (13) supporting said tilting wing (2) and a bottom end portion coupled to a supporting bracket (14) for supporting said slidable wing (3), and that said vertical bracket (9) is slidable along a guide (10) included in a box-like body (11), such that a translatory movement of said slidable wing will correspond to a tilting or swinging movement of said tilting wing, to define at least a closed position and at least an open position of said wings.
2. A device, according to claim 1, **characterized in that** said cabinet comprises two sidewalls (5), a bottom panel (6), a top panel (7) and a bottom (24), and that said pivoting mechanism (8) is applied to one sidewall or both said sidewalls (5).
3. An opening and closing device, according to claims 1 and 2, **characterized in that** said pivoting mechanism (8) operates so that, as said slidable wing (4) is lowered and raised, said tilting wing (2) is respectively raised and lowered.
4. An opening and closing device, according to claim 1, **characterized in that** said tilting wing (2) is supported by said hinge (13) and is further articulated

to said cabinet by a top hinge (18).

5. An opening and closing device, according to claim 4, **characterized in that** said top hinge (18) is fixed inside said top panel (7) of said cabinet. 5
6. An opening and closing device, according to claim 1, **characterized in that** said box-like body (11) is coupled to said sidewall (5) and comprises a protective cover element (12). 10
7. An opening and closing device, according to claim 1, **characterized in that** said vertical bracket (9) has an adjustable in length, to fit said pivoting mechanism (8) to cabinets of different heights. 15
8. An opening and closing device, according to claim 1, **characterized in that** said vertical bracket (9) comprises a top portion (15) and a bottom portion (16), each said portion (15, 16) including a perforated portion, thereby adjusting an overall length of said vertical bracket (9), by arranging at a different spacing the perforated portions onto one another and by fixing said perforated portions by fixing bolts, rivets or the like, engaged through holes (17) formed through said two portions (15, 16). 20 25
9. An opening and closing device, according to one or more of the preceding claims, **characterized in that** said device further comprises dampening means for dampening the opening and closing stroke of said wings (2, 3). 30
10. An opening and closing device, according to claim 9, **characterized in that** said dampening means comprise a first piston damper (19) and a second piston damper (20), said piston dampers (19, 20) being mounted on a supporting block (21) fixed to the body (11) of the device in parallel to said guide (10) at a middle position, to be respectively and alternatively engaged by the top portion (15) of said supporting bracket (14). 35 40
11. An opening and closing device, according to claim 1, **characterized in that** said pivoting mechanism (8) comprises a return spring (22) so calibrated as to counterbias the weight of the tilting wing (2). 45
12. An opening and closing device, according to claim 1, **characterized in that** said slidable wing (3) comprises a handle or other gripping member (23). 50

#### Patentansprüche

1. Öffnungs- und Schließvorrichtung (1) für einen aufgehängten Schrank und dergleichen, wobei die Vorrichtung zumindest einen Kippflügel (2) zur gelenki-

gen Anbringung an dem Schrank durch ein oberes Scharnier (18), das mit einem weiteren Flügel (3) zum Schließen einer vorderen Öffnung (4) des Schranks zusammenwirkt, wobei der Kippflügel (2) und weitere Flügel (3) durch einen Schwenkmechanismus (8) schwenkbar miteinander verbunden sind, **dadurch gekennzeichnet, dass** der weitere Flügel (3) ein Gleitflügel (3) ist und dass der Schwenkmechanismus (8) einen vertikalen Träger (9) umfasst, der einen oberen Endabschnitt, der schwenkbar mit einem Scharnier (13) verbunden ist, welches den Kippflügel (2) stützt, und einen unteren Endabschnitt aufweist, der an einen Stützträger (14) zum Stützen des Gleitflügels (3) gekuppelt ist, und dass der vertikale Träger (9) derart eine Führung (10), die in einem schachtelartigen Körper (11) beinhaltet ist, entlang verschiebbar ist, dass eine Translationsbewegung des gleitbaren Flügels einer Kipp- oder Schwingbewegung des Kippflügels zum Definieren von zumindest einer geschlossenen Position und zumindest einer offenen Position der Flügel entspricht.

2. Vorrichtung nach Anspruch 1, **dadurch gekennzeichnet, dass** der Schrank zwei Seitenwände (5), eine Bodenplatte (6), eine obere Platte (7) und einen Boden (24) umfasst, und dass der Schwenkmechanismus (8) auf eine Seitenwand oder beide Seitenwände (5) ausgeübt ist.
3. Öffnungs- und Schließvorrichtung nach einem der Ansprüche 1 oder 2, **dadurch gekennzeichnet, dass** der Schwenkmechanismus (8) derart arbeitet, dass der Kippwinkel (2), wenn der gleitbare Flügel (4) abgesenkt oder angehoben ist, entsprechend angehoben oder abgesenkt ist.
4. Öffnungs- und Schließvorrichtung nach Anspruch 1, **dadurch gekennzeichnet, dass** der Kippflügel (2) durch das Scharnier (13) gestützt ist und ferner durch ein oberes Scharnier (18) gelenkig an dem Schrank angebracht ist.
5. Öffnungs- und Schließvorrichtung nach Anspruch 4, **dadurch gekennzeichnet, dass** das obere Scharnier (18) innerhalb der oberen Platte (7) des Schranks befestigt ist.
6. Öffnungs- und Schließvorrichtung nach Anspruch 1, **dadurch gekennzeichnet, dass** der schachtelartige Körper (11) an die Seitenwand (5) gekuppelt ist und ein Schutzabdeckungselement (12) umfasst.
7. Öffnungs- und Schließvorrichtung nach Anspruch 1, **dadurch gekennzeichnet, dass** der vertikale Träger (9) eine einstellbare Länge aufweist, um den Schwenkmechanismus (8) an Schränke mit verschiedenen Höhen zu montieren.

8. Öffnungs- und Schließvorrichtung nach Anspruch 1, **dadurch gekennzeichnet, dass** der vertikale Träger (9) einen oberen Abschnitt (15) und einen unteren Abschnitt (16) umfasst, wobei jeder der Abschnitte (15, 16) einen gelochten Abschnitt beinhaltet, wodurch eine Gesamtlänge des vertikalen Trägers (9) durch Anordnen in einer anderen Beabstandung der gelochten Abschnitte aufeinander und durch Befestigen der gelochten Abschnitte durch Befestigungsbolzen, Nieten oder dergleichen, die durch Löcher (17) in Eingriff genommen sind, welche durch die zwei Abschnitte (15, 16) ausgebildet sind, eingestellt ist. 5
9. Öffnungs- und Schließvorrichtung nach einem oder mehreren der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** die Vorrichtung ferner Dämpfungsmittel zum Dämpfen des Öffnungs- und Schließstoßes der Flügel (2, 3) umfasst. 10
10. Öffnungs- und Schließvorrichtung nach Anspruch 9, **dadurch gekennzeichnet, dass** die Dämpfungsmittel einen ersten Kolbendämpfer (19) und einen zweiten Kolbendämpfer (20) umfassen, wobei die Kolbendämpfer (19, 20) an einem Stützblock (21), der an dem Körper (11) der Vorrichtung parallel zu der Führung (10) an einer mittleren Position befestigt ist, zur jeweiligen und alternativen Ineingriffnahme durch den oberen Abschnitt (15) des Stützträgers (14) angebracht sind. 15
11. Öffnungs- und Schließvorrichtung nach Anspruch 1, **dadurch gekennzeichnet, dass** der Schwenkmechanismus (8) eine Rückholfeder (22) umfasst, die zum Ausgleichen des Gewichts des Kippflügels (2) kalibriert ist. 20
12. Öffnungs- und Schließvorrichtung nach Anspruch 1, **dadurch gekennzeichnet, dass** der gleitbare Flügel (3) einen Handgriff oder ein anderes Greifglied (23) umfasst. 25
- (13) supportant ledit battant basculant (2) et une partie d'extrémité inférieure couplée à un bras de fixation et de support (14) permettant de supporter ledit battant coulissant (3) et **en ce que** ledit bras de fixation vertical (9) peut coulisser le long d'un guide (10) inclus dans un corps semblable à une boîte (11) de telle sorte qu'un mouvement de translation dudit battant coulissant correspond à un mouvement de basculement ou de balancement dudit battant basculant pour définir au moins une position fermée et au moins une position ouverte desdits battants.
2. Dispositif selon la revendication 1, **caractérisé en ce que** ledit placard comprend deux parois latérales (5), un panneau de fond (6), un panneau supérieur (7) et un fond (24), et **en ce que** ledit mécanisme de pivotement (8) est appliqué à une paroi latérale ou aux deux dites parois latérales (5). 30
3. Dispositif d'ouverture et de fermeture selon les revendications 1 et 2, **caractérisé en ce que** ledit mécanisme de pivotement (8) fonctionne de telle sorte que, lorsque ledit battant coulissant (4) est abaissé et relevé, ledit battant basculant (2) est respectivement relevé et abaissé. 35
4. Dispositif d'ouverture et de fermeture selon la revendication 1, **caractérisé en ce que** ledit battant basculant (2) est supporté par ladite charnière (13) et est en outre articulé sur ledit placard grâce à une charnière supérieure (18). 40
5. Dispositif d'ouverture et de fermeture selon la revendication 4, **caractérisé en ce que** ladite charnière supérieure (18) est fixée à l'intérieur dudit panneau supérieur (7) dudit placard. 45
6. Dispositif d'ouverture et de fermeture selon la revendication 1, **caractérisé en ce que** ledit corps semblable à une boîte (11) est couplé à ladite paroi latérale (5) et comprend un élément de couvercle de protection (12). 50
7. Dispositif d'ouverture et de fermeture selon la revendication 1, **caractérisé en ce que** ledit bras de fixation vertical (9) est ajustable en longueur afin de s'adapter au dit mécanisme de pivotement (8) sur les placards de différentes hauteurs. 55
8. Dispositif d'ouverture et de fermeture selon la revendication 1, **caractérisé en ce que** ledit bras de fixation vertical (9) comprend une portion supérieure (15) et une portion inférieure (16), chaque dite portion (15, 16) incluant une portion perforée permettant d'ajuster ainsi une longueur globale dudit bras de fixation vertical (9), en agençant suivant un espacement différent les portions perforées l'une par rapport à l'autre et en fixant lesdites portions perforées

## Revendications

1. Dispositif d'ouverture et de fermeture (1) pour un placard suspendu et similaire, ledit dispositif comprenant au moins un battant basculant (2) devant être articulé sur ledit placard grâce à une charnière supérieure (18) coopérant avec un autre battant (3) pour fermer une ouverture avant (4) dudit placard, ledit battant basculant (2) et l'autre battant (3) pivotant l'un par rapport à l'autre grâce à un mécanisme de pivotement (8), **caractérisé en ce que** ledit autre battant (3) est un battant coulissant (3) et **en ce que** ledit mécanisme de pivotement (8) comprend un bras de fixation vertical (9) présentant une partie d'extrémité supérieure qui pivote sur une charnière

à des boulons ou à des rivets de fixation ou similaires engagés dans des trous traversants (17) formés dans lesdites deux portions (15, 16).

9. Dispositif d'ouverture et de fermeture selon une ou plusieurs des revendications précédentes, **caractérisé en ce que** ledit dispositif comprend en outre des moyens amortisseurs permettant d'amortir le choc de l'ouverture et de la fermeture desdits battants (2, 3). 5 10
10. Dispositif d'ouverture et de fermeture selon la revendication 9, **caractérisé en ce que** lesdits moyens amortisseurs comprennent un premier amortisseur à piston (19) et un second amortisseur à piston (20), lesdits amortisseurs à piston (19, 20) étant montés sur un bloc support (21) fixé sur le corps (11) du dispositif, parallèlement au dit guide (10), dans une position médiane pour que la portion supérieure (15) dudit bras de fixation et de support (14) s'engage respectivement et alternativement sur ceux-ci. 15 20
11. Dispositif d'ouverture et de fermeture selon la revendication 1, **caractérisé en ce que** ledit mécanisme de pivotement (8) comprend un ressort de rappel (22) étalonné de manière à contrebalancer le poids du battant basculant (2). 25
12. Dispositif d'ouverture et de fermeture selon la revendication 1, **caractérisé en ce que** ledit battant coulissant (3) comprend une poignée ou tout autre élément de préhension (23). 30

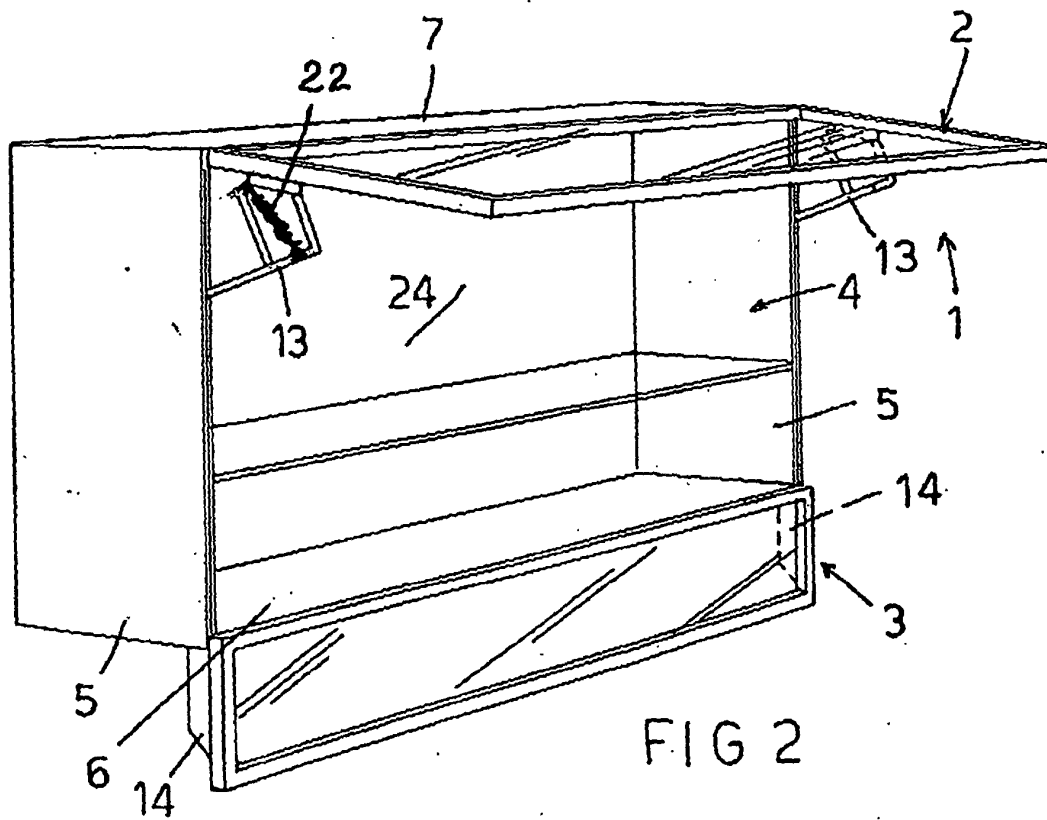
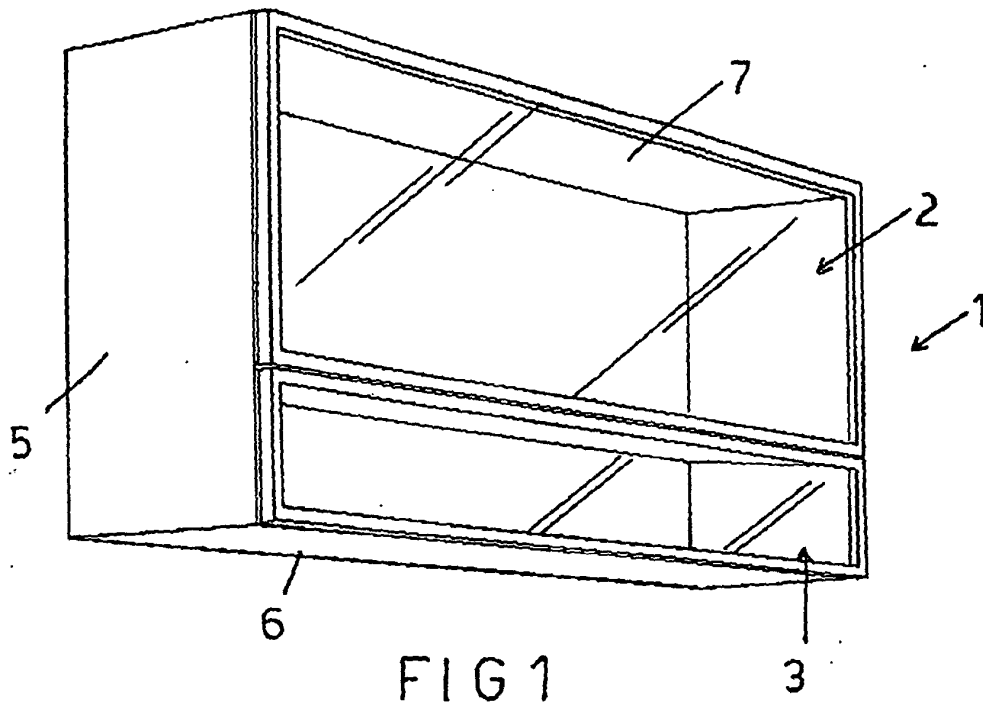
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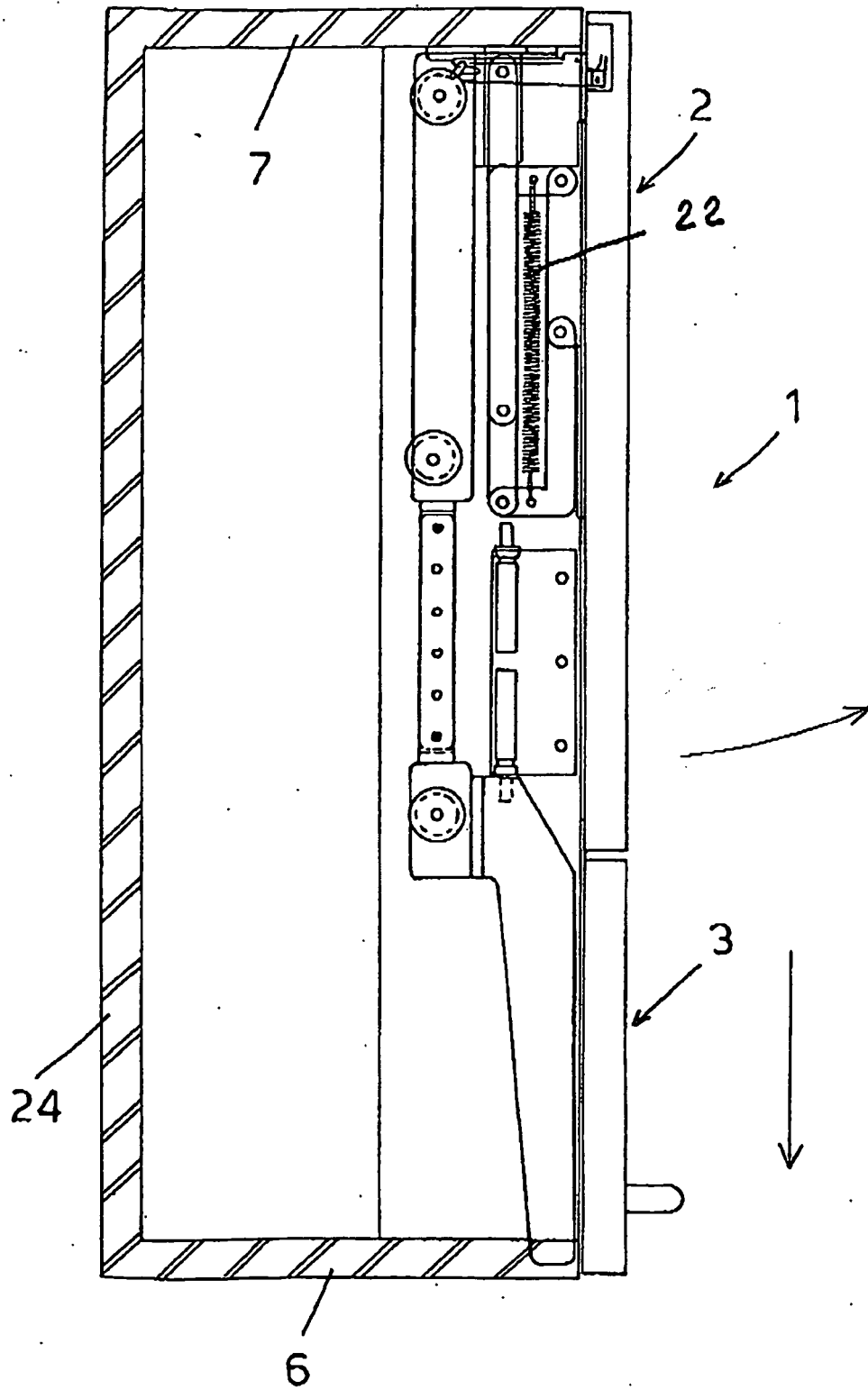
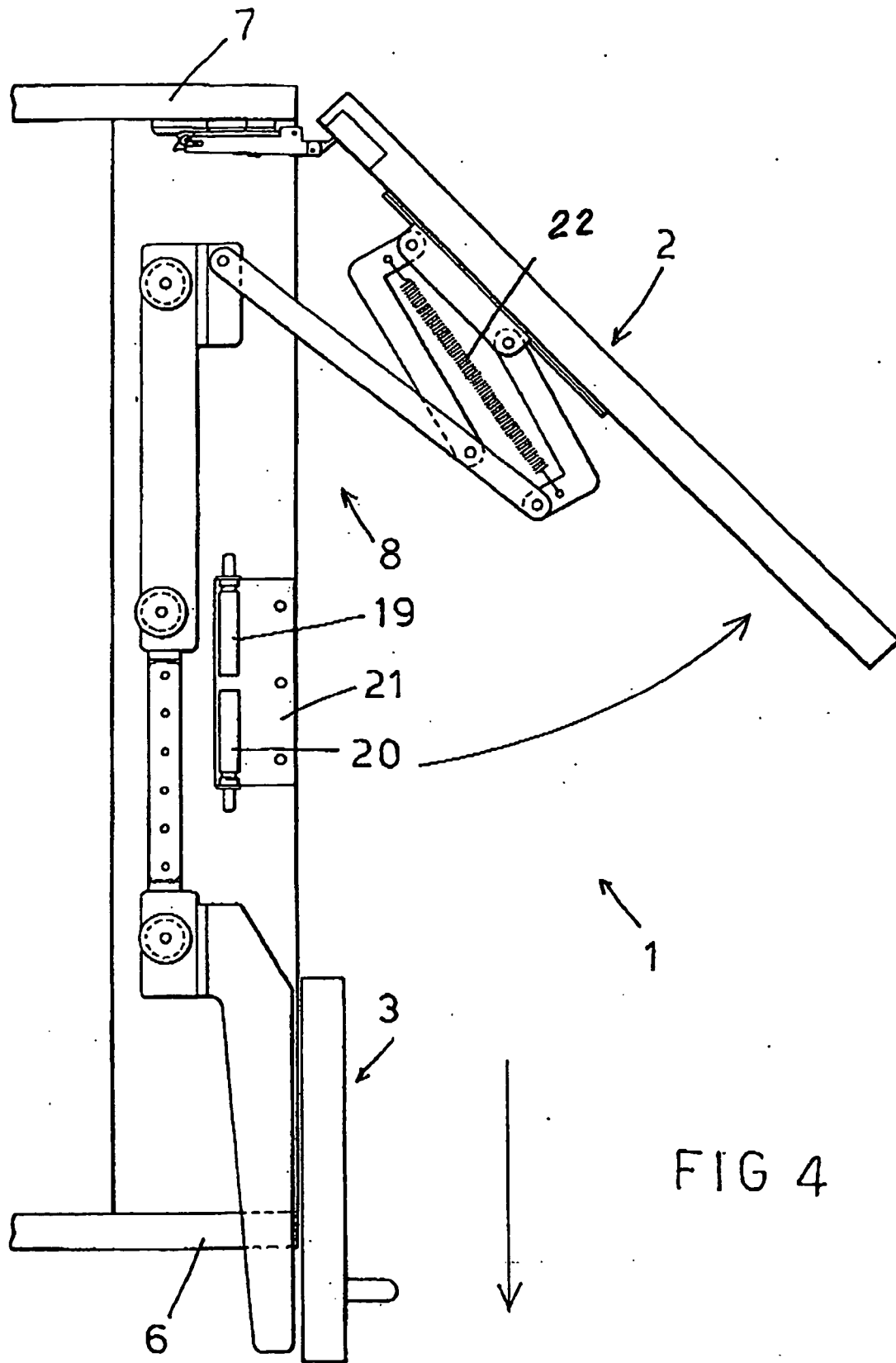
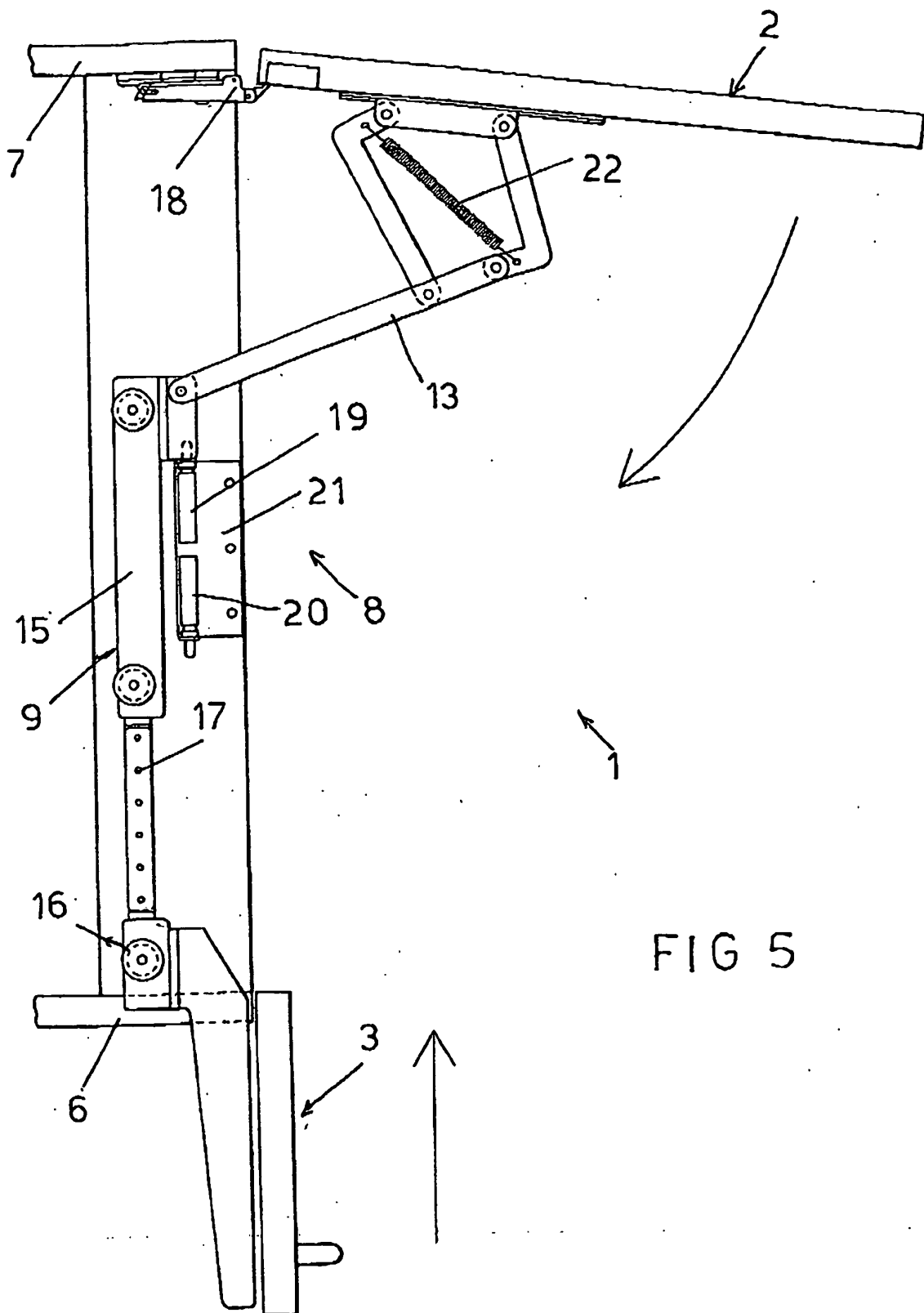
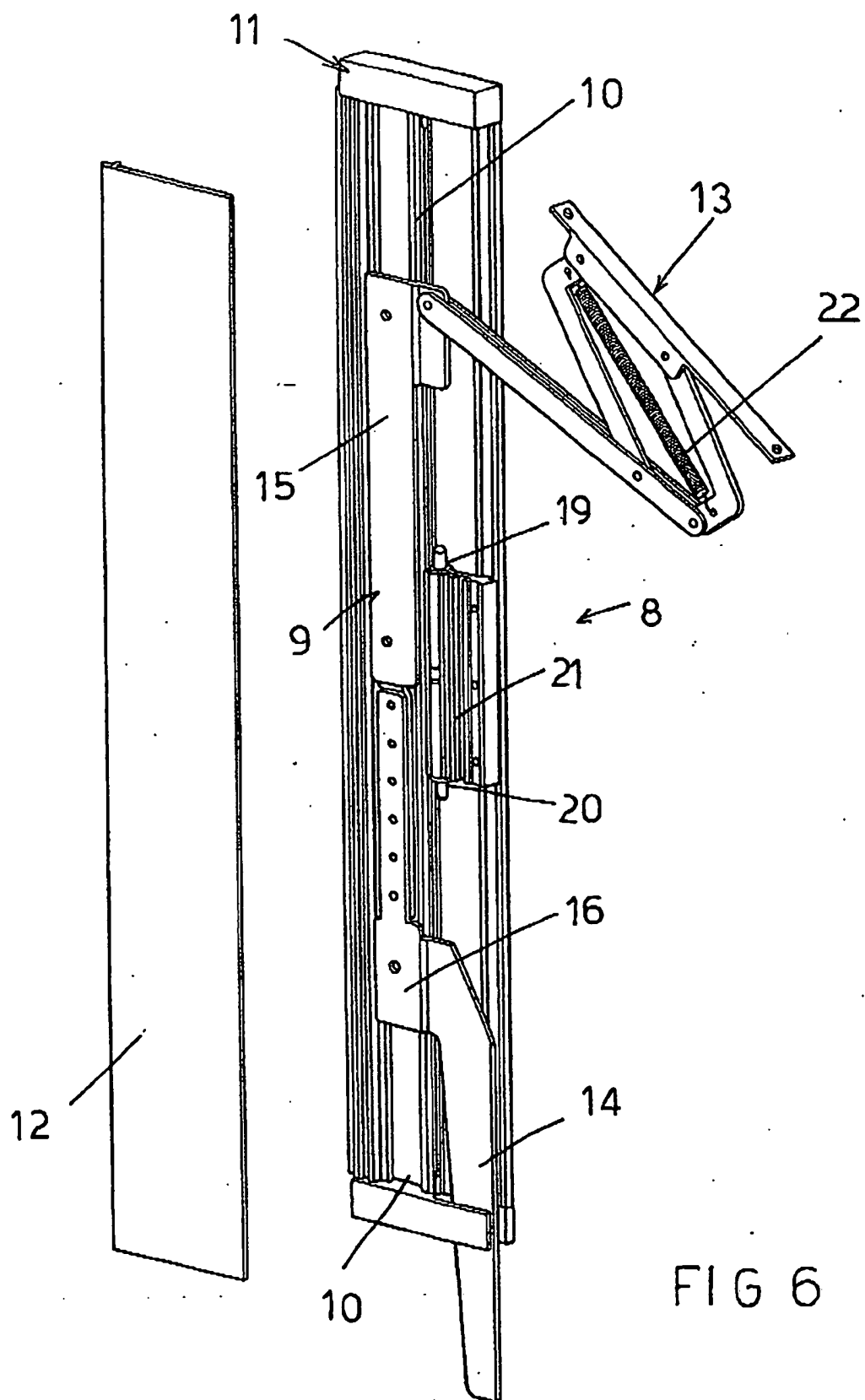


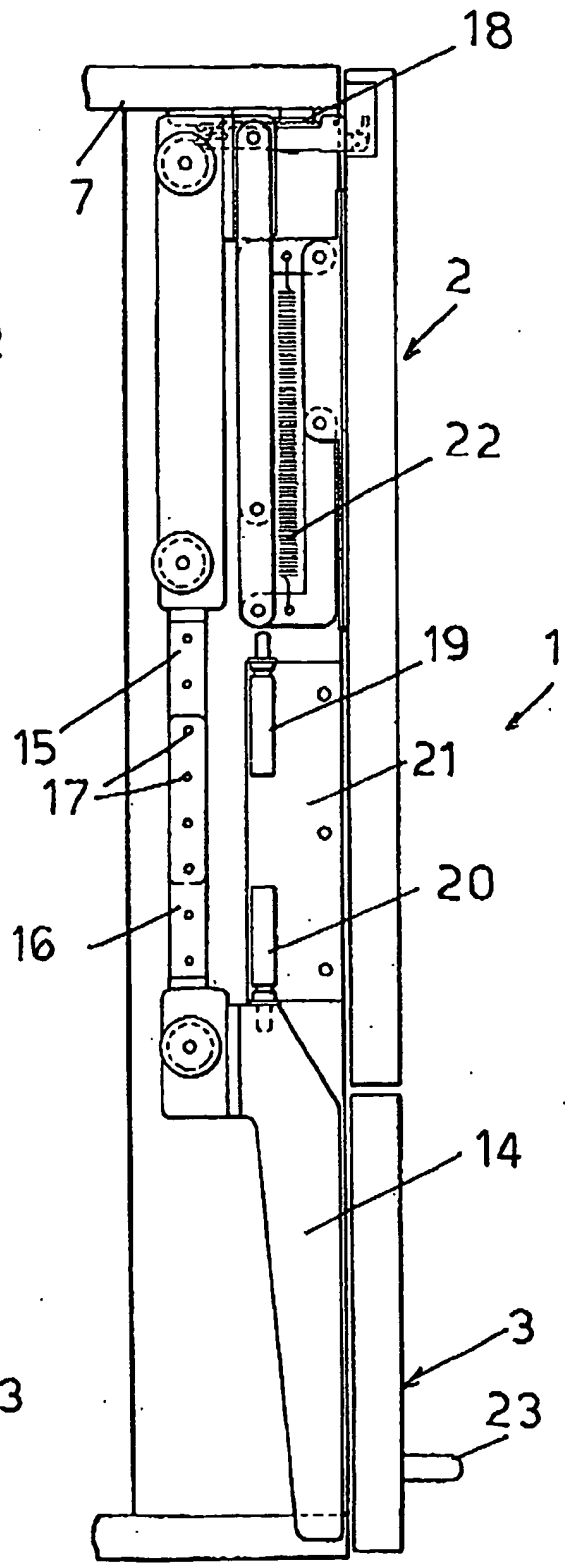
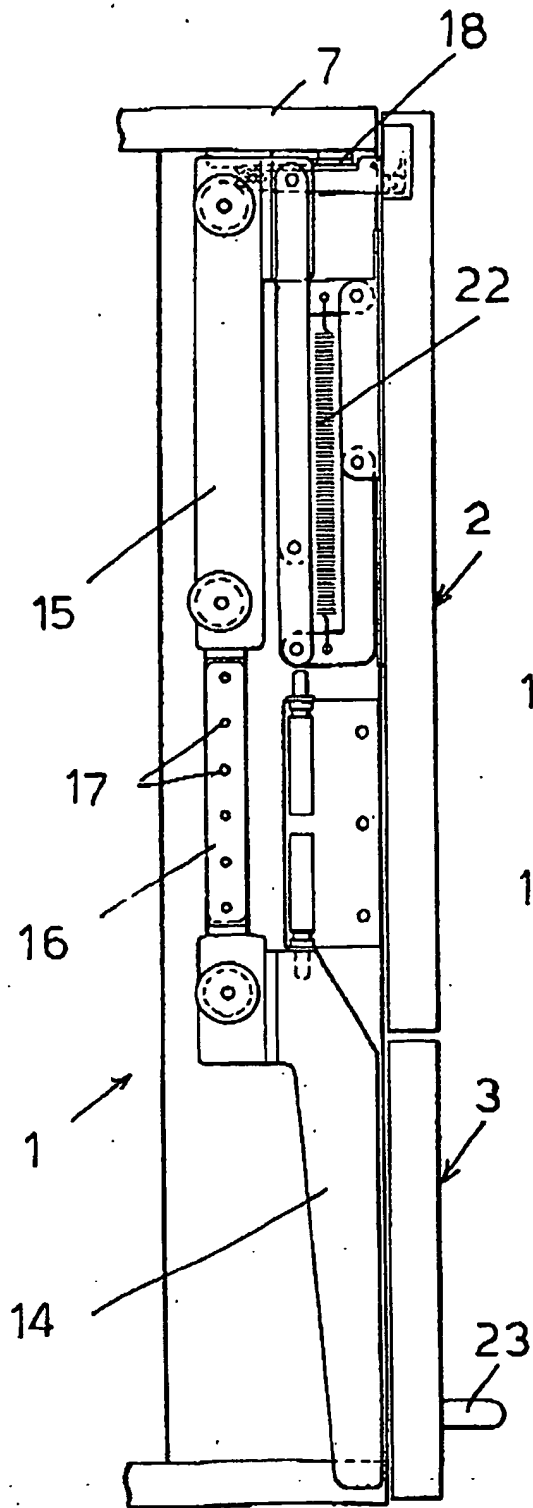
FIG 3

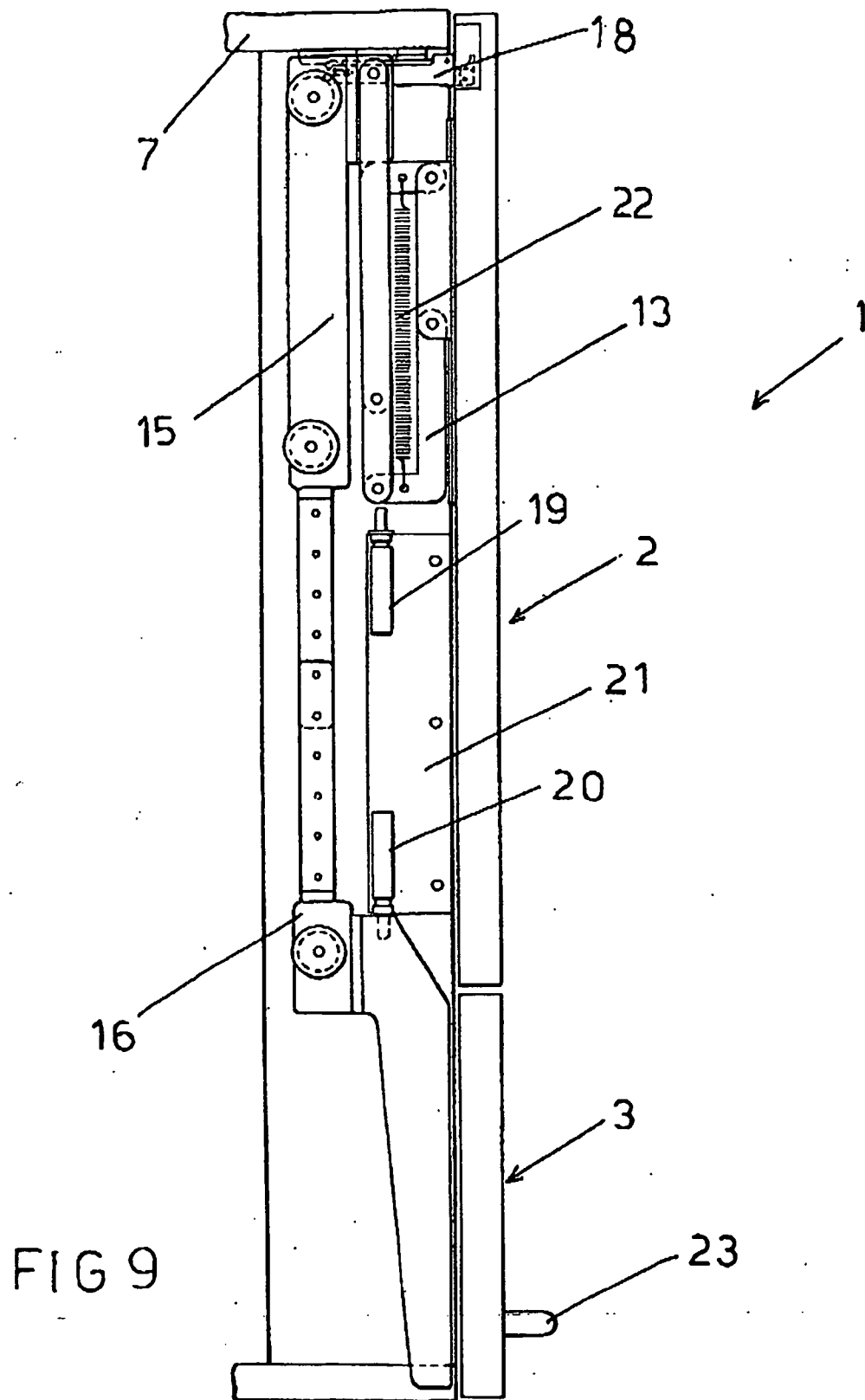












**REFERENCES CITED IN THE DESCRIPTION**

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**Patent documents cited in the description**

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