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(54) **Mechanism for moving a carriage of a waste-bin**

(57) The mechanism (31) moves a carriage (5) of a waste-bin (1) from a position in which it is completely retracted in a space (21) in a piece of furniture (22) to a completely extracted position. The mechanism (31) comprises a body (26) attached to a wall (23) of the space (21) and provided with two first guides (28) along which the carriage (5) slides, a first lever (32) provided with a first extremity hinged to a door (25) of the piece of furniture (22) and with a second extremity which carries a first pin (34), a second lever (35) provided with a first extremity hinged to the body (26) and with a second extremity which

carries a second pin (36) slidable along a second guide (13) obtained in the carriage (5), and a notch (37) obtained along a lateral edge of the second lever (35) and suitable to receive the first pin (34) as the door (25) is opened so that the rotation as the door (25) is opened causes a rotation of the second lever (35) and so that the sliding of the second pin (36) in the second guide (13) causes the carriage (5) being pulled towards the outside of the piece of furniture (22).

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Description

[0001] The present invention relates to a mechanism for moving a carriage of a waste-bin housed in a piece of furniture.

[0002] As is known, increasing use is being made of kitchen cabinets in which the waste-bin housed in the cabinet slides out of the cabinet on a carriage when the door is opened. The mechanism required to move the carriage consists of a large number of components in that it comprises levers, racks, toothed wheels, etc. Said mechanism comprises a lever pivoted at one end to the door and provided on a portion thereof with a rack that meshes with a toothed wheel which, as it turns causes the carriage to slide along specific guides due to a specific kinematic mechanism. Said coupling mechanism between the rack and the toothed wheel results in a multiplication of the speed at which the carriage slides. The carriage basically slides at a higher speed than that with which the door is opened by the user. Due to said multiplication of speed, not only is there a possibility of the carriage and thus of the waste-bin, coming off the guides, but the components of the mechanism are also subject to excessive wear and unpleasant noises frequently occur due to friction between the components of the mechanism. The high number of components that make up the mechanism and the wear on these also increase the likelihood of said mechanism jamming and/or jerking, exposing said components to further wear.

[0003] The purpose of the present invention is to provide a mechanism for moving a carriage of a waste-bin housed in a piece of furniture that overcomes the drawbacks described above in that it consists of fewer components, can be assembled easily and quickly and enables the carriage to move at a speed that is substantially the same as that at which the user opens the door of the piece of furniture.

[0004] According to the present invention there is provided a mechanism for moving a carriage of a waste-bin from a position in which it is completely retracted in a space in a piece of furniture to a position in which it is completely extracted from said space, characterized in that it comprises:

a body attached to a bottom wall of said space and provided with two lateral guides along which said carriage is able to slide;

a first lever provided with a first axial extremity hinged to a bracket carried by a door of said piece of furniture and with a second axial extremity which carries a first pin;

a second lever provided with a first axial extremity hinged to said body and of with a second axial extremity which carries a second pin slidable along a second guide obtained in said carriage; and

a notch obtained along a lateral edge of said second lever and suitable to receive said first pin as the door is opened so that the rotation as said door is opened

causes a rotation of said second lever about the hinge point on said body and so that the sliding of said second pin in said second guide causes said carriage being pulled towards the outside of said piece of furniture.

[0005] The present invention will now be described with reference to the accompanying drawings, illustrating a non-limiting embodiment thereof, in which:

figure 1 is a perspective view of a waste-bin;

figure 2 is a perspective view of a portion of the waste-bin of figure 1;

figure 3 is a plan view of a mechanism for moving a carriage of a waste-bin in a first position;

figure 4 is a plan view of the mechanism of figure 3 in a second position; and

figure 5 is a plan view of the mechanism of figure 3 in a third position.

[0006] With reference to figure 1, designated as a whole by number 1 is a prism-shaped waste-bin defined by four vertical walls 2 (a front wall, a rear wall and two side walls), a bottom wall 3 and a lid 4 mounted on the upper edges of the walls 2. The waste-bin 1 is provided with a carriage 5 defined by a frame 6 attached by fastening means to the lower portion of the waste-bin 1 and in particular the frame 6 interiorly contains the bottom wall 3. The frame 6 is rectangular in shape and in particular comprises a front section 7, a rear section 8 and two side sections 11; the sections 11 are longer than the sections 7 and 8. The carriage 5 also comprises two flaps 12 parallel to the sections 11 of the frame 6 and which extend downwards. The flaps 12 are arranged on the inside of the frame 6, they are attached to the sections 11 and are slightly shorter than the sections 11. Lastly, the carriage 5 comprises a guide 13 defined by two rectilinear sections 14 and 15 which define a V shape in that they converge towards one another in a central area of the carriage 5; at the point at which the two sections 14 and 15 converge they are separated by a small wall 16. Each section 14 and 15 is defined by two respective flaps 17.

[0007] With reference to figures 3 to 5, the waste-bin 1 is housed in a space 21 in a piece of furniture 22; the space 21 is defined by a bottom wall 23, a side wall 24 and a door 25 hinged to the wall 24. A body 26 is attached to the bottom wall 23 and defined by a horizontal plate 27 having a rectangular perimeter. Two guides 28 are obtained in correspondence with the longest sides of the plate 27 along which a respective flap 12 of the carriage 5 is able to slide. In use the carriage 5 is suitable to translate along a direction F from a position in which it is completely retracted in the space 21 (figure 3) to a position in which it is completely extracted from the space 21 illustrated in figure 5. The guides 28 and thus the flaps 12 are parallel to the direction F. The wall 16 is on the centre line of the plate 27 and the point at which the sections

14 and 15 of the guide 13 converge faces the innermost part of the space 21.

[0008] With reference to figures 3, 4 and 5, designated as a whole by number 31 is a mechanism for moving the carriage 5 that carries the waste-bin 1 from said completely retracted position (figure 3) to said completely extracted position (figure 5). The mechanism 31 comprises a first lever 32 defined on a horizontal plane and of which a first axial extremity is hinged to a bracket 33 carried by the door 25 on the part facing the space. In the completely retracted position of the carriage 5, as illustrated in figure 3 the lever 32 is arranged parallel to the direction F and close to the centre line axis of the body 26. At a second axial extremity, the lever 32 is provided with a pin 34 which extends upwards. The mechanism 31 comprises a second lever 35 provided with a first axial extremity hinged to the plate 27 at a hinge point C1 and a second axial extremity from which a pin 36 extends upwards and is slidable along the guide 13. The lever 35 is defined on a horizontal plane and on the centre line thereof is provided on both sides with a respective notch 37. The hinge point C1 of said first extremity of the lever 35 is obtained in the part of the plate 27 closest to the door 25.

[0009] The piece of furniture 22 that is illustrated is of the type with a right-opening door 25. It is important to note that the guide 13 comprises two sections 14 and 15 and the lever 35 is provided with two notches 37 on opposite sides, in that the mechanism 31 is designed for pieces of furniture 22 with either a right or left-opening door 25. The only difference in the mechanism 31 for the two types of pieces of furniture is the hinge point of said first axial extremity of the lever 35. An additional hinge point C2 is provided on the plate 27 arranged symmetrically, with respect to the centre line of the plate 27, to the hinge point C1. For a first type of opening of the door 25 the pin 36 slides along the section 14 of the guide 13, whereas for the second type of opening of the door 25 the pin 36 slides along the section 15 of the guide 13.

[0010] In the completely retracted position of the carriage 5 illustrated in figure 3, the door 25 is closed, the lever 32 is parallel to the direction F, the pin 36 of the lever 35 is in the portion of the section 14 close to the wall 16, and the vertex of the guide 13 is close to the innermost part of the space 21. The lever 35 is thus in a position in which the notches 37 thereof are facing the innermost part of the space 21. From the position illustrated in figure 3, when the user starts to open the door 25 the mechanism assumes the position shown in figure 4. In moving from the position shown in figure 3 to that shown in figure 4, the carriage does not move until the pin 34 of the lever 32 enters the notch 37 of the lever 35; the other notch 37 being provided for pieces of furniture with a left-opening door. When the pin 34 has entered the notch 37 the additional rotation, as the door 25 is opened, causes the lever 35 to rotate in an anti-clockwise direction about the point C1 and as the pin 36 is engaged in the section 14 of the guide 13 the carriage 5 is pulled towards the outside of the piece of furniture 22. On the

contrary, starting with the carriage 5 in the position illustrated in figure 5, when the door 25 is closed the lever 35 rotates in a clockwise direction and the carriage 5 moves towards its completely retracted position.

[0011] Note that as the carriage 5 travels towards its completely retracted position, said carriage 5 could collide with its end-stop. According to the embodiment illustrated in figures 3, 4 and 5, a shock-absorber 51 of a known type is installed in correspondence with said end-stop against which a bracket 52 carried by the carriage 5 rests when the door 25 is closed.

[0012] The advantages of the present invention are apparent from the above description.

[0013] In particular, the mechanism 31 for moving the carriage 5 of the waste-bin 1 is a straightforward construction, with a limited number of components and thus involves lower production costs. Note that once the notch 37 catches the pin 34 a rotation of the door 25 causes the carriage 5 to translate without any multiplication of speed and thus preventing the waste-bin 5 from coming out of the space 21. Moreover the mechanism 31 can be adapted for use with either a right or left-opening door 25. Lastly, the installation of a shock-absorber 51 prevents the carriage 5 from colliding with the end-stop when the door is closed.

Claims

1. Mechanism for moving a carriage (5) of a waste-bin (1) from a position in which it is completely retracted in a space (21) of a piece of furniture (22) to a position in which it is completely extracted from said space (21), **characterized in that** it comprises:

a body (26) attached to a bottom wall (23) of said space (21) and provided with two first lateral guides (28) along which said carriage (5) is able to slide;

a first lever (32) provided with a first axial extremity hinged to a bracket (33) carried by a door (25) of said piece of furniture (22) and with a second axial extremity which carries a first pin (34);

a second lever (35) provided with a first axial extremity hinged to said body (26) and with a second axial extremity which carries a second pin (36) slidable along a second guide (13) obtained in said carriage (5); and

a notch (37) obtained along a lateral edge of the second lever (35) and suitable to receive said first pin (34) as said door (25) is opened so that the rotation as said door (25) is opened causes a rotation of said second lever (35) about its hinge point (C1) on said body (26) and so that the sliding of said second pin (36) in said second guide (13) causes said carriage (5) being pulled towards the outside of said piece of furniture

(22).

2. Mechanism according to claim 1 **characterized in that** said second guide (13) comprises at least one section (14 or 15) defined along a horizontal axis arranged obliquely with respect to the direction (F) of the movement of said carriage (5). 5
3. Mechanism according to claim 2 **characterized in that** said second guide (13) is V-shaped with the vertex towards the innermost part of said space (21), said second lever (35) being provided on opposite lateral edges with a respective said notch (37) and on said body (26) there being provided, symmetrically with respect to the centre line thereof, a second hinge point (C2) of said second lever (35) making the arrangement suitable for both right and left-opening doors. 10 15
4. Mechanism according to any one of the previous claims **characterized in that** it comprises a shock absorber (51) carried by said body (26) against which, in use, an appendix (52) carried by said carriage (5) rests when said door (25) is closed. 20 25

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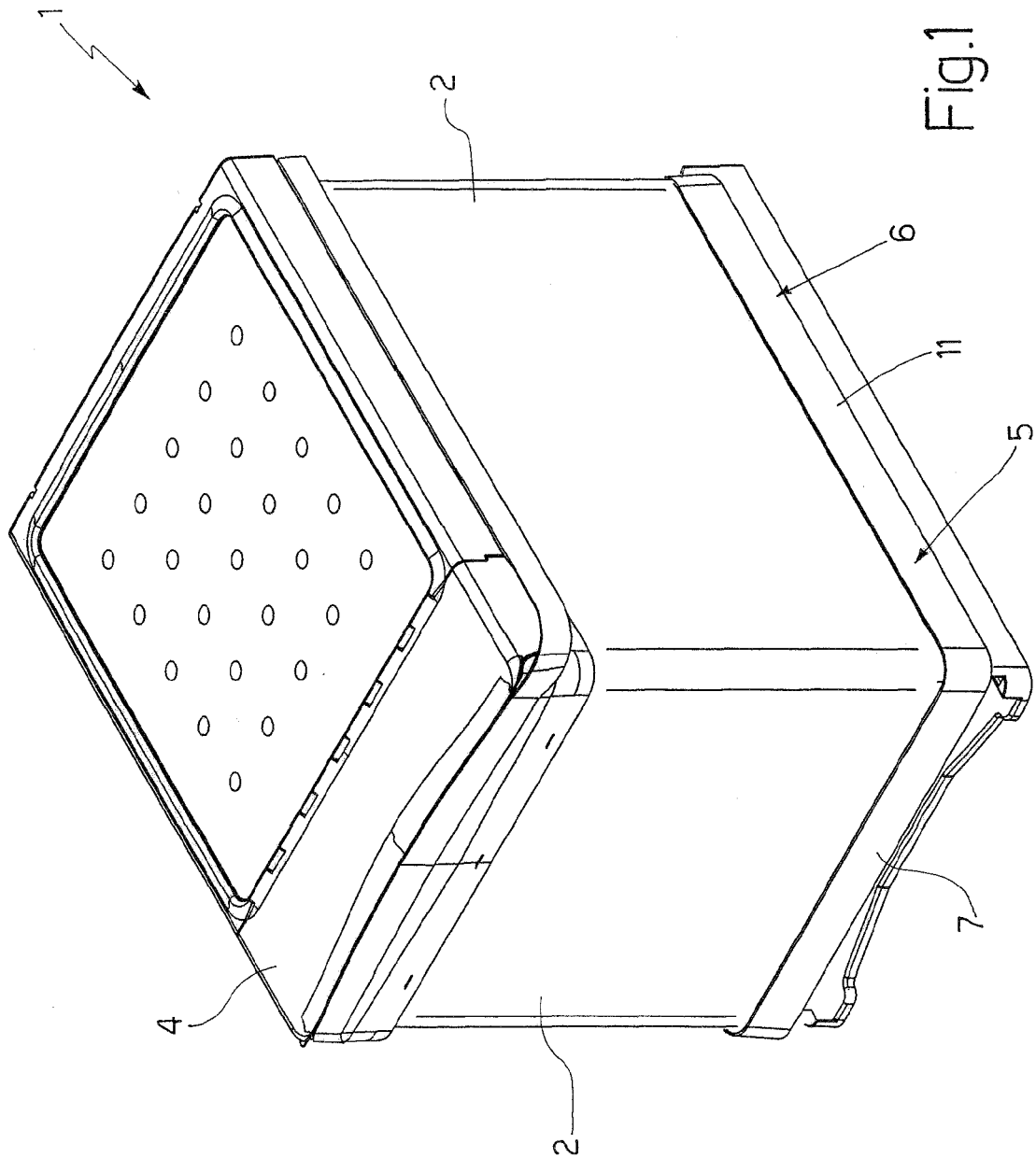
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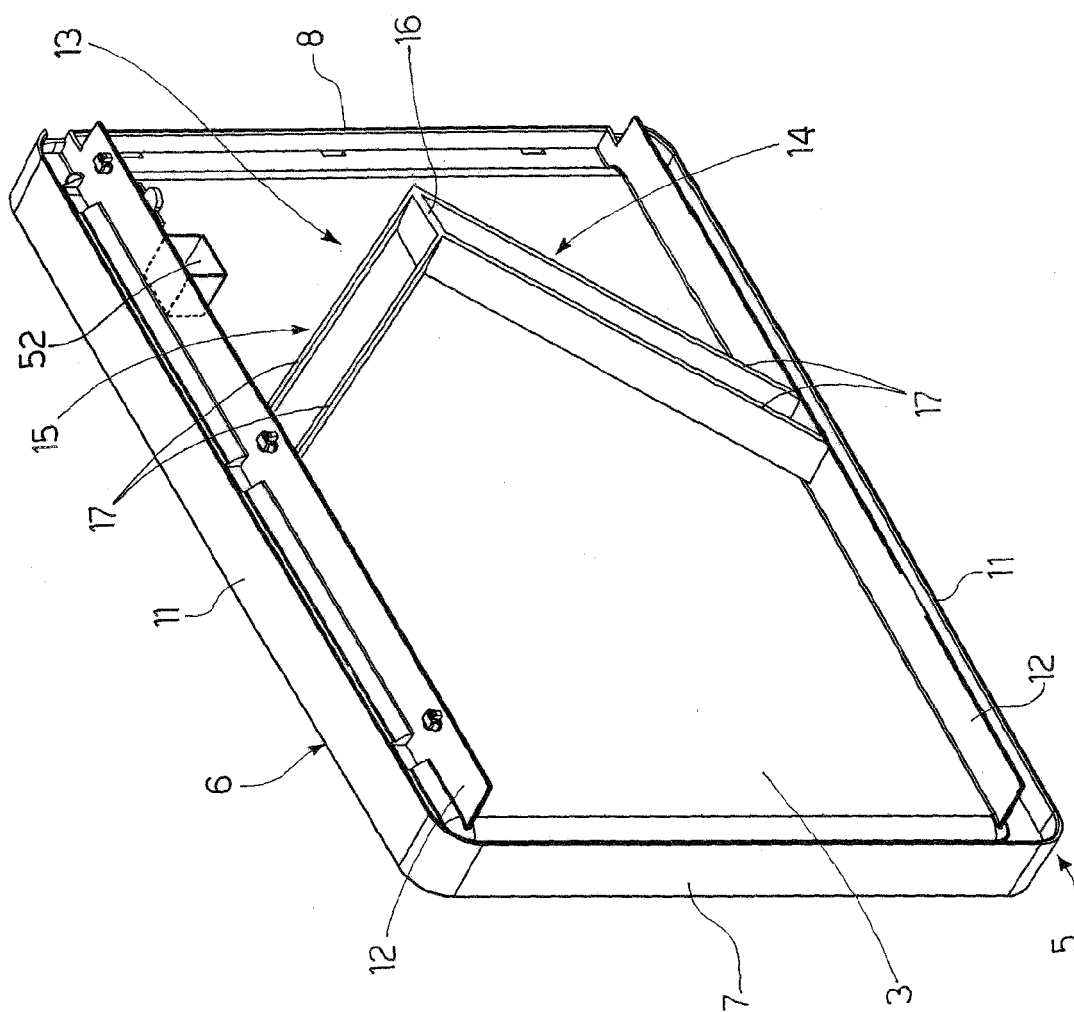


Fig. 2

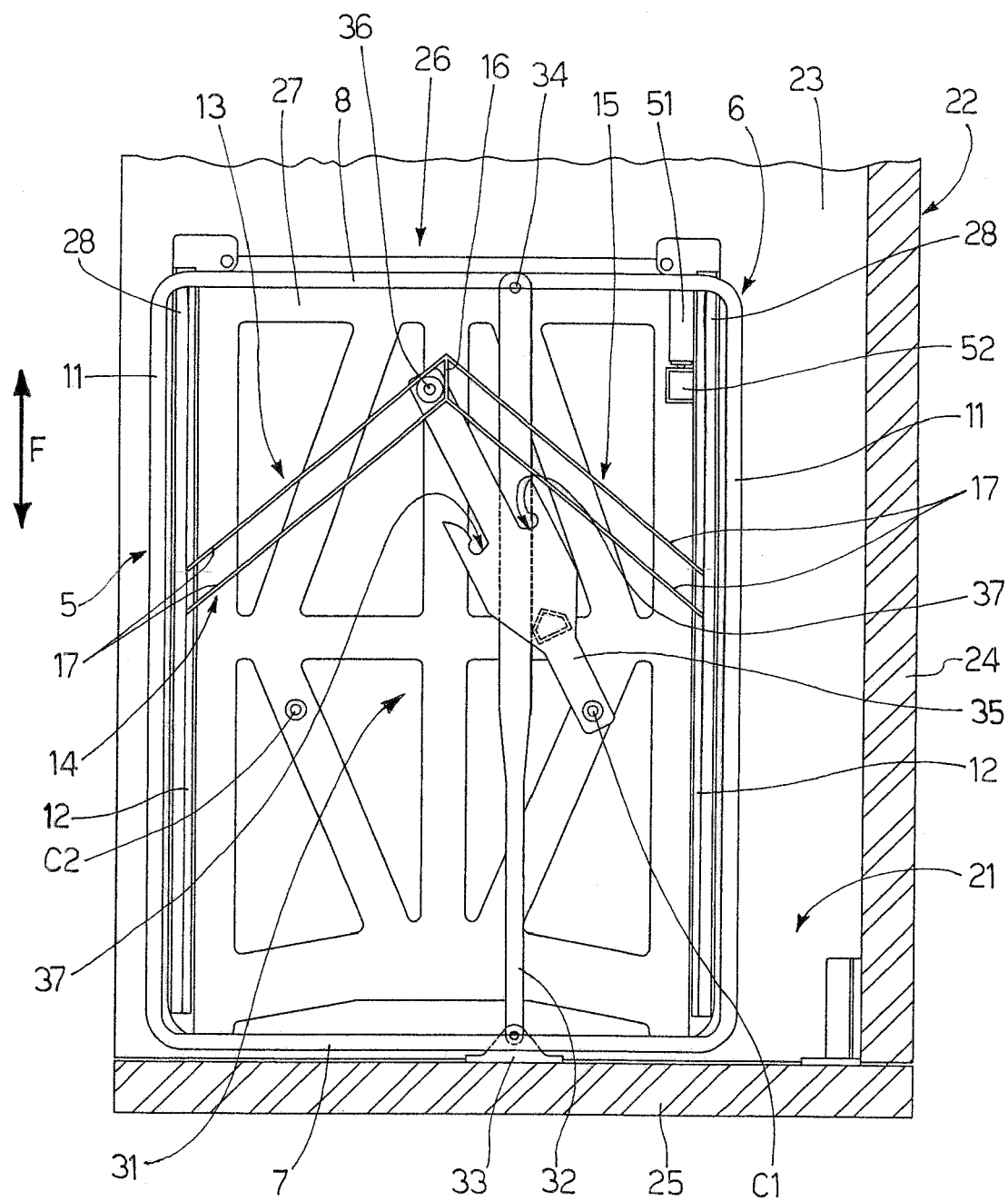
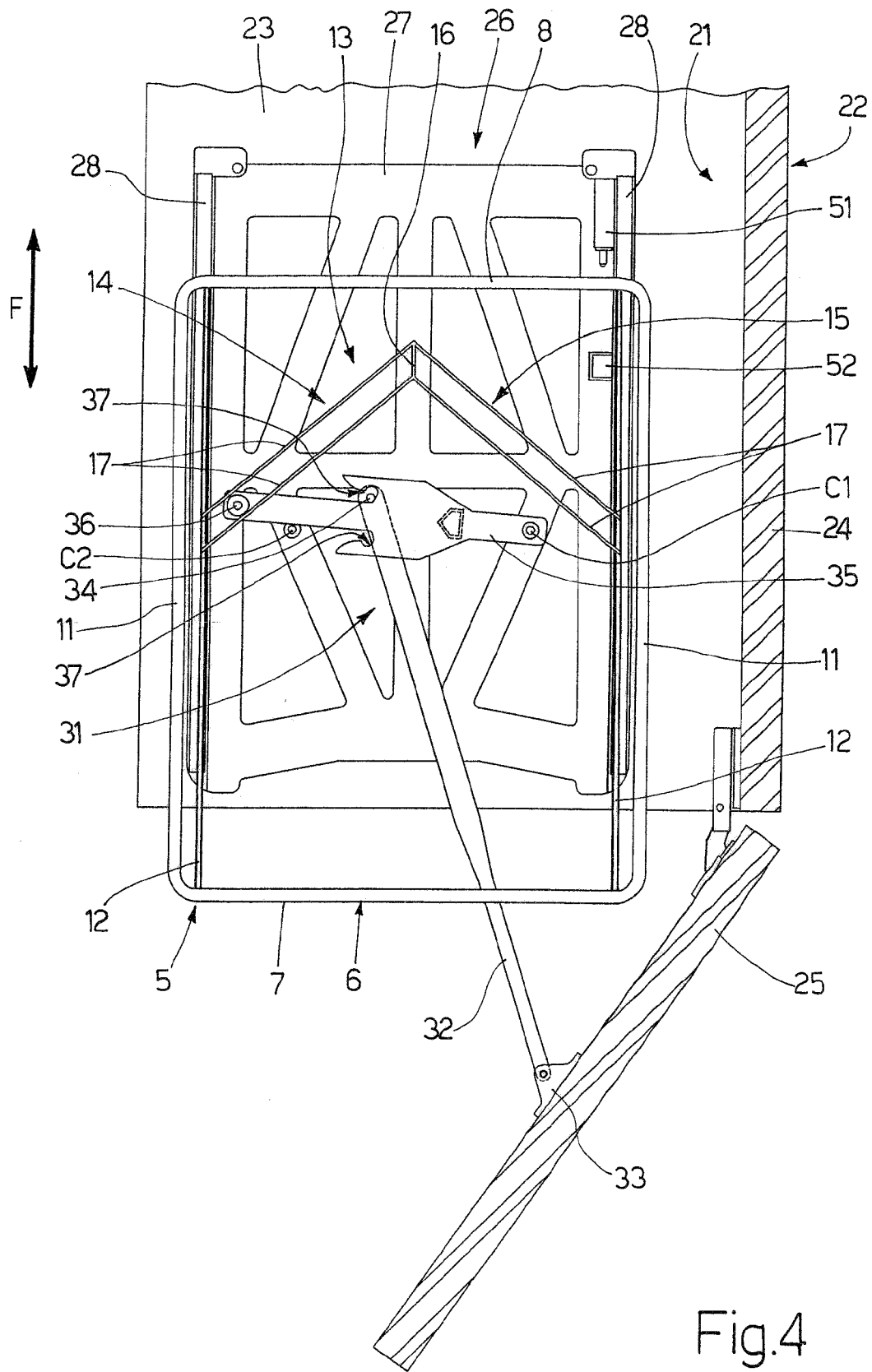


Fig.3



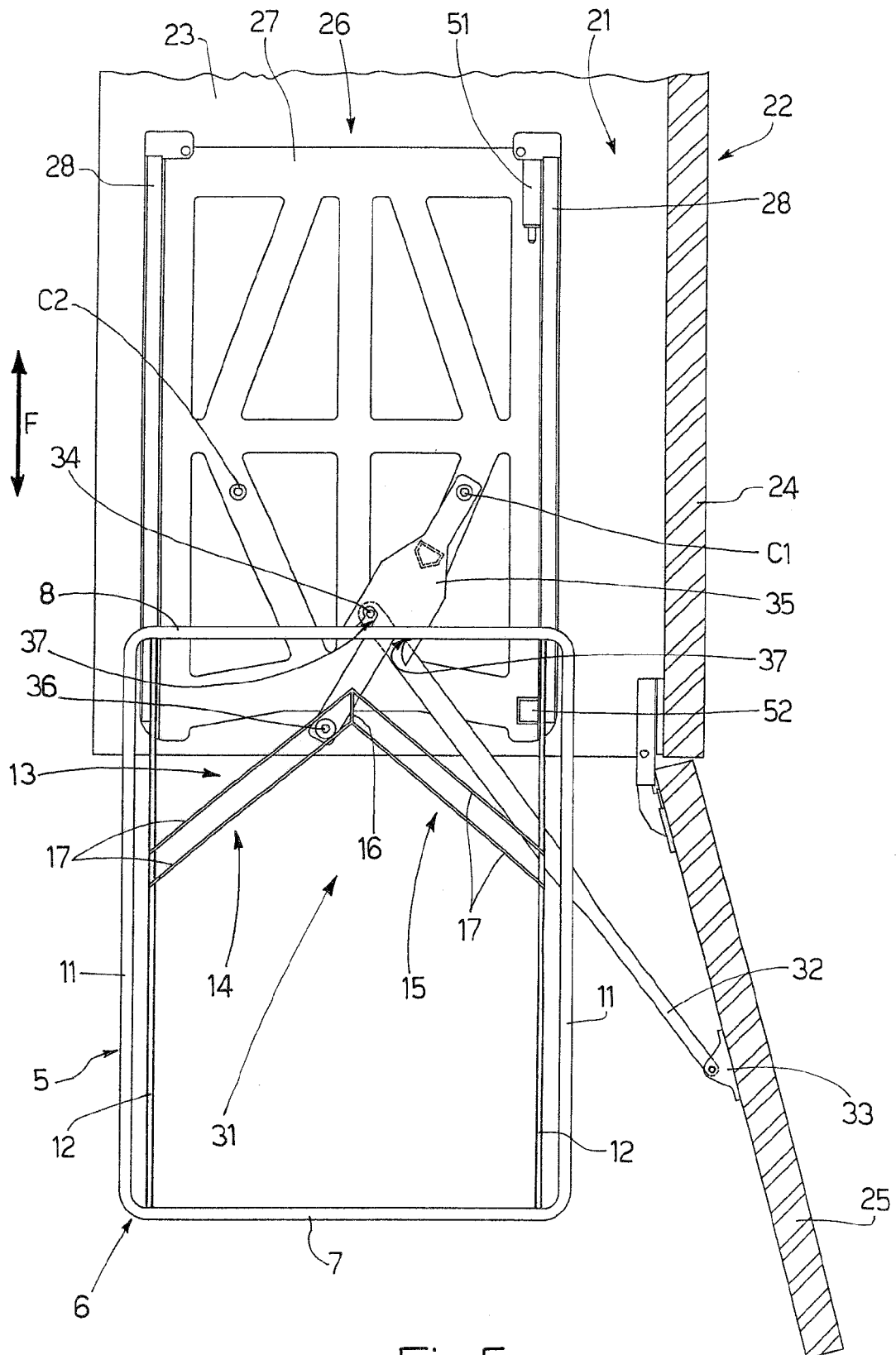


Fig.5



EUROPEAN SEARCH REPORT

Application Number
EP 08 16 7871

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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A	DE 93 07 535 U (NOSS KÜCHENTECHNIK GMBH) 22 July 1993 (1993-07-22) * page 3, line 18 - page 6, line 16 * * figures 1,2 *	1	
A	DE 33 04 159 C (HAILO-WERK RUDOLF LOH GMBH & CO. KG) 11 October 1984 (1984-10-11) * column 3, line 30 - column 4, line 47 * * figures 1-3 *	1	TECHNICAL FIELDS SEARCHED (IPC) B65F A47B
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 22 January 2009	Examiner Smolders, Rob
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	

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

EP 08 16 7871

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82