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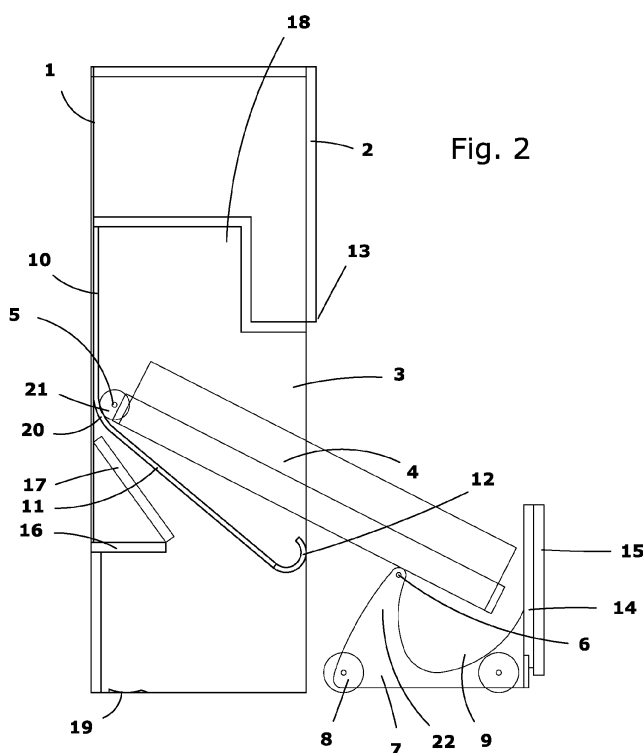
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(54) **Bed unit**

(57) It comprises an external body (1) with a hollow space (3) for housing a bed (4) without folding this, and which comprises a rolling system for extending and putting away the bed from and to said zone (3) respectively, in which the interior of the zone (3) has at least one guide (10, 11) on which a wheel (5) can run, set in the lower part of the inner side of the bed (4) and in that it also comprises at least one carriage (7) for support and movement from the outer side of the bed outward, said carriage (7) being hinged to said bed (4) by means of an

axle (6), which, in the bed, is set on a line close to the outer lower edge of the bed (4), under this and at a certain distance from said edge; the bed assuming a sloping position when inserted into the furniture unit, leaving its lateral parts of greatest length at a different height, and with the larger surface areas of the bed being left in an almost vertical position, with the hollow space (3) also comprising a zone which forms an upper interior cavity (18) in which the upper part of the bed (4) can be housed in its concealed position.



Description

[0001] This invention refers to a piece of furniture which includes a concealable bed in its lower part and possibly a desk, shelving unit, cupboard or similar item at the top.

[0002] Houses are very small nowadays, which is why it is often difficult to find space in a room for different pieces of furniture, such as a bed and a desk. In larger houses free space is often required for different purposes, or simply because this is wished for. It is therefore desirable to have a bed unit available which does not require the bed to be permanently set up, and which at the same time is easy and convenient to set up for use.

[0003] There are different kinds of concealable beds. One type of bed has a hinge at its headboard end and the lower end forms a false door of a wardrobe or shelf, after being folded up. Another type is foldable and convertible into a seating unit, such as a sofa, when the folding action is longitudinal, or an armchair, when this folds transversally. There are also beds which are folded in half to form a medium-height console.

STATE OF THE ART

[0004] ES U 0132050 describes a bed unit in which this folds by halves, from a fixed front part, the moving part being fitted with fixed items for closing and decorating the furniture item.

[0005] U0133213 describes a piece of furniture in which the beds are concealed in a wardrobe from a single hinging axle.

[0006] U0138352 discloses a sofa-type furniture unit that is convertible into a bed.

[0007] U0166405 describes a piece of furniture for concealable foldable beds with a fixed single hinging axle.

DESCRIPTION OF THE INVENTION

[0008] For interpretation purposes we should point out that what we will call the inner side of the bed is the one where the furniture unit stands, after deploying the bed (taking it out of its housing). In turn, the outer side is the one from which the user can get up, with no hindrance from the piece of furniture.

[0009] This invention refers to a bed unit which comprises:

- An external body which forms the casing of the unit, possibly fitted with a desk, but also a shelf, cupboard or similar;
- A lower hollow space in said external body,
- A carriage carrying the outer side of the bed (in usage position); this carrying carriage is fitted with a hinging system close to said outer side;
- An interior guide in the hollow space fitted with means for guiding the inner side of the bed, opposite

the former; the guide is divided into at least two parts:

- o A first essentially vertical part which forms the upper end and
- o A second part, forming an angle in respect of the first over 90°, and preferably from 110° to 160°, which has a lower outer end;
- o At its lower outer end this guide also comprises a stop for the movement of a wheel or wheels fitted on the bed;

- At least one wheel set on said second side of the bed, able to run along said guide;
- An external body joined to the carriage carrying the first side of the bed, normally divided into two portions; this body is essentially flat, and constitutes the front section closing the external body and is able to fold by hinging; normally the folding will be done towards the outside of the bed unit;
- A flat inner horizontal plane set inside the hollow space formed in the external body, normally able to be extended by hinging, constituting a surface like a night table.

BRIEF DESCRIPTION OF THE DRAWINGS

[0010] In order to illustrate the following explanation, four sheets of drawings are enclosed with this descriptive report, in which four figures represent the essence of this invention, and in which:

- Figure 1 shows a schematic lateral view of the bed unit according to the invention, in a first position in which this bed is totally concealed inside the cavity formed inside the unit;
- Figure 2 shows a schematic lateral view similar to the one in Figure 1, but in which the bed is in an intermediate phase of being drawn out;
- Figure 3 shows a schematic lateral view similar to the ones in Figures 1 and 2, but in which the bed is fully extended in the horizontal position and set out, ready to be used;
- Figure 4 shows a schematic perspective view of the extended bed unit according to a preferred configuration; and
- Figure 5 shows a view similar to the one in Figure 4, in which an option is represented with the hinged bed base.

DESCRIPTION OF THE FORMS OF EMBODIMENT OF THE INVENTION

[0011] As has been stated, this invention consists of a bed unit, which is made up of an external body (1) comprising a hollow space (3) at its lower end, this hollow space (3) being accessible from the front (the part that is seen) of said external body (1).

[0012] Said hollow space (3) allows a bed (4) (a bed

base and a mattress) to be fitted in this in a sloping position, that is, keeping its longer side parts at a different height, the larger surface of the bed being stored in an almost vertical position. The bed (4) will normally be a single bed with a size of 80 or 90 cm wide by 180 to 200 cm long.

[0013] According to a preferential embodiment, the external body comprises at the top an open body such as a shelf, or an opening unit, such as a desk (2) with a hinged base, a cupboard or a drinks cabinet, drawers etc., or any other furniture item able to be adapted.

[0014] The inside of the cavity comprises at least one guide (10, 11) on which a wheel (5) set at the bottom of the bed, on the inside, is able to run. This wheel (5) has a longitudinal axis parallel to the longer sides of the bed body (4).

[0015] The inner guide is normally divided into two parts (10, 11):

- A first part (10) is essentially vertical and forms the upper section of the guide, normally backing on to the rear (interior) part of the furniture unit;
- A second part (11), forms an angle of over 90°, and preferably from 110° to 160°, in respect of the first one, and has a lower outer end; according to the preferred option as shown, the angle is roughly 135° ± 10°; said second part (11) extends outwards as far as the front (inner) plane of the outer (interior side) edge, or as far as a point close to said front plane. The term front (inner) plane is used for the one forming the front closing board inside the furniture unit.

[0016] There will normally be two guides (10, 11), one at each end of the bed (5), another by the bed head and another close to the feet. These guides will be set outside the bed, though the set would be similarly effective with a single guide in a central zone of the bed, or with a number of guides over two.

[0017] Between the first part and the second part there is a curved section (20) which joins said sections and forms a continuation of the guide.

[0018] The bottom end of the guide, and particularly that of the second part in turn forms a curved portion (12), which has been shown as semicircular, which acts as a stop for the movement of the bed when it is being opened.

[0019] The bed (4) is supported on two axles. The first axle (21) is associated with a wheel (5) able to move along the guides (10, 11). A second axle (6) connects the bed (4) with a carriage (7) for support and movement of the outer side of the bed outwards. The axle (6) is set close to the lower outer edge of the bed (4), but at a certain distance from this.

[0020] The carriage (7) carrying the outer side of the bed (4) has a set of wheels (8) which enable easy sliding inwards and outwards to and from the concealment position. When the bed (4) is put away, the carriage (7) is entirely positioned inside the hollow space (3) in the ex-

ternal body (1). When the bed (4) is extended to be used, the carriage (7) is totally or partially concealed under said bed (4).

[0021] To carry out its function satisfactorily and be able to be put away inside the external body (1), the body has a protuberance (22) upwards and outwards, whose upper portion has the axle (6) for hinging with the bed (4). The axle (6) for hinging with the bed is set on a vertical side located roughly 2/3 along the axle of the outer wheel/s (8) and 1/3 along the axle of the interior wheel/s. The positioning of said axle (6) in said protuberance (22) also means that the bed (4) is at the right height when it has to be used. To be able to house the bed when it is put away, the carriage also comprises a hollow zone (9), in which the outer edge of the bed (4), which is at a certain distance from the hinging axle (6), allows the portion of the body which lies under said axle (6) in the concealment position to be located.

[0022] The item that has been called a carriage could be a single carriage along the whole bed with wheels at the ends or be a set of independent carriages.

[0023] One preferred option which enables greater use of the space to be made also includes an upper interior cavity (18) which allows housing the upper part of the bed (4) when this is put away. This option is particularly appropriate when the furniture unit forms a desk (2), so that the height of this desk, apart from taking up a portion of the top part of the furniture unit, does not prevent the bed from being put away, thus optimising the use of the space occupied by said furniture unit. In the case of a desk it has been designed for such a desk to be hinged to the external body (1) by means of a hinge (13).

[0024] In order to make the outer surface of the furniture unit look pleasant, the carriage holds a covering part (14, 15) for the cavity which constitutes the front closing piece of said external body in the area of the hollow for allowing the bed (4) through. The covering part (14, 15) is normally divided into two parts, a lower part (14) fixed to the front part (the outermost one) of the carriage (7) and a second part or upper part (15), hinged to the lower part, and which can be folded by means of hinge and backed on to said lower part (14).

[0025] A set of magnets for securing the carriage (7) or pieces connected with this is fitted in the surroundings of the cavity (13). The furniture unit can optionally comprise a set of projections (19) to ensure proper positioning of the wheels of the carriage (7), so that the covering part (14, 15) is properly aligned with the external body (1).

[0026] Under the guides, and along the at least one portion of the length of the bed, there is a first flat inner horizontal body (16), which in the preferential option is hinged to a second flat body (17) able to articulate in respect of the first, which forms a night table. Some auxiliary item, such as one or more drawers or shelves, can be placed at the top or bottom of said body, on condition that these do not interfere with the movement of the other parts of the furniture unit.

[0027] Obviously, the inner rear wall of the body (1)

can be fitted with mechanisms for operating electrical items and/or current sockets.

[0028] Although the mechanism for extending the bed (4) is normally manual, in a motor-driven option, the furniture unit comprises, backing on to its inner rear wall, a motor with a spool which holds a cable. This motor and spool are located at a height close to that of the bed base (4), and the end of the cable will be secured to a zone close to the lower outer edge of said bed base (4), for example by means of a hook. When the motor is driven, due to the cable pulling this, the bed is forced to enter the hollow space (3), maintaining the support on the carriage and with the inner edge sliding along the guides (10, 11), until the total retraction position is attained, a position in which the motor is stopped, for example, by means of a limit switch. To extend the bed, all one needs to is to operate the motor in the opposite direction or, if the device is fitted with a clutch, declutch the clutch connection between the spool and the motor.

[0029] In one option, the bed base (4) comprises a part (23) that is hinged at at least one of its ends. This hinged portion (23) can be either manually operated or motor-driven.

Claims

1. A bed unit, which comprises an external body (1) with a hollow space (3) for housing a bed (4) unfolded, and which comprises running means for extending and putting away the bed from and to said hollow space (3) respectively, characterised because it comprises inside the hollow space (3) at least one guide (10, 11) on which a wheel (5) can run, set on the lower part of the inner side of the bed (4) and in that it also comprises at least one carriage (7) for support and movement of the outer side of the bed outwards, this carriage (7) being articulated to said bed (4) by means of an axle (6), which, in the bed, is set on a line close to the lower outer edge of the bed (4), under this and at a certain distance from said edge; the bed taking a sloping position when inserted into the unit, leaving its lateral parts of greatest length at a different height, and with the larger surfaces of the bed being in an almost vertical position, with the hollow space (3) comprising a zone which forms an upper inner cavity (18) in which the upper part of the bed (4) can be housed in the concealed position.
2. A bed unit, according to claim 1, **characterised in that** the carriage (7) is fully or partly concealed under said bed when this is in the extended position.
3. A bed unit, according to claim 1 or claim 2, **characterised in that** the inner guide is divided into two parts (10, 11):

- An essentially vertical first part (10) which forms the top section of the guide, and which backs on to the rear (inner) side of the furniture unit; and

- A second part (11), which forms an angle in respect of the first part (10) of over 90°; said second part (11) extends outwards as far as the front (inner) plane of the outer (inner) edge, or as far as a point close to said front plane; and

in that the second part (11) of the guide forms an angle in respect of the first part (10) of from 110° to 160° and **in that** the second part (11) of the guide forms an angle in respect of the first portion (10) of $135^\circ \pm 10^\circ$, and between the first part (10) and the second part (11) of the guide there is a curved section (20) which connects said sections and forms a continuation of said guide.

4. A bed unit, according to claim 3, **characterised in that** the lower end of the second part in turn forms a curved portion (12) as a stop for the bed movement while opening.
5. A bed unit, according to any of the previous claims, **characterised in that** the bed assumes a sloping position when inserted into the unit, leaving its side parts of greatest length at different heights, and with the upper surface of the bed remaining in an almost vertical position.
6. A bed unit, according to any of the previous claims, **characterised in that** the external body comprises at the top, over the hollow space (3), an open body such as a shelf, or an opening item, such as a desk (2) with a hinged base, drawers, cupboard or drinks cabinet.
7. A bed unit, according to any of the previous claims, **characterised in that** the carriage (7) has a protuberance (22) upward and outward, whose upper part has the axle (6) for hinging with the bed (4), which is at a certain distance from the hinging axle (6), is able to be located in a concealed position, the axle (6) for hinging with the bed being set on a vertical line located roughly 2/3 along the axle of the outer wheel/s (8) of said axle and 1/3 along the axle of the inner wheel/s.
8. A bed unit, according to any of the previous claims, **characterised in that** the carriage holds a part (14, 15) for covering the zone which constitutes the closing front of said external body in the zone of the hollow space for allowing the bed (4) through, said covering piece (14, 15) being divided into two parts, a lower part (14) fixed to the front part of the carriage (7) and an upper part (15), hinged to the lower part, and which can be folded and backed onto the lower

part (14).

9. A bed unit, according to any of the previous claims, **characterised in that** there is a set of magnets in the surroundings of the cavity (13), able to secure the carriage (7) or pieces connected to this. 5
10. A bed unit, according to any of the previous claims, **characterised in that** it also includes, along at least one portion of the length of the bed, a first flat inner horizontal body (16) like a night table. 10
11. A bed unit, according to claim 10, **characterised in that** it also comprises a second flat body (17), hinged in respect of the first flat inner horizontal body. 15
12. A bed unit, according to any of claims 10 and 11, **characterised in that** the upper or lower part of the flat inner horizontal body (16) comprises auxiliary items, such as one or more drawers or shelves. 20
13. A bed unit, according to any of the previous claims, **characterised in that** the rear inner wall of the body (1) is fitted with mechanisms for operating electrical items and/or current sockets. 25
14. A bed unit, according to any of the previous claims, **characterised in that** the furniture unit comprises, backing onto its inner rear wall, a motor with a spool which holds a cable, the end of the cable being secured to a zone close to the lower outer edge of the bed base (4). 30
15. A bed unit, according to any of the previous claims, **characterised in that** the bed base (4) comprises a part (23) hinged at least one of its ends, said hinged part (23) able to be manually operated or motor-driven. 35

Amended claims in accordance with Rule 137(2) EPC.

1. A bed unit, comprising: 45
 - an external body (1) with a hollow space (3) for housing a bed (4) unfolded, and which comprises running means for extending and putting away the bed from and to said hollow space (3) respectively, 50
 - the hollow space (3) having at least one guide (10, 11) on which a wheel (5) can run, set on the lower part of the inner side of the bed (4)
 - at least one carriage (7) for support and movement of the outer side of the bed outwards, this carriage (7) being articulated to said bed (4) by means of an axle (6), which, in the bed, is set on a line close to the lower outer edge of the bed 55

(4), under this and at a certain distance from said edge;

- the hollow space (3) of the external body comprising a zone which forms an upper inner cavity (18) in which the upper part of the bed (4) can be housed in the concealed position;

characterised in that

the inner guide is divided into two parts (10, 11):

- An essentially vertical first part (10) which forms the top section of the guide, and which backs on to the rear (inner) side of the furniture unit; and
- A second part (11), which forms an angle in respect of the first part (10) of over 90°; said second part (11) extends outwards as far as the front (inner) plane of the outer (inner) edge, or as far as a point close to said front plane; and

in that the second part (11) of the guide forms an angle in respect of the first part (10) of from 110° to 160° and **in that** the second part (11) of the guide forms an angle in respect of the first portion (10) of 135° ± 10°, and between the first part (10) and the second part (11) of the guide there is a curved section (20) which connects said sections and forms a continuation of said guide;

the bed taking a sloping position when inserted into the unit, leaving its lateral parts of greatest length at a different height, and with the larger surfaces of the bed being in an almost vertical position.

2. A bed unit, according to claim 1, **characterised in that** the carriage (7) is fully or partly concealed under said bed when this is in the extended position.

3. A bed unit, according to claim 2, **characterised in that** the lower end of the second part in turn forms a curved portion (12) as a stop for the bed movement while opening.

4. A bed unit, according to any of the previous claims, **characterised in that** the bed assumes a sloping position when inserted into the unit, leaving its side parts of greatest length at different heights, and with the upper surface of the bed remaining in an almost vertical position.

5. A bed unit, according to any of the previous claims, **characterised in that** the external body comprises at the top, over the hollow space (3), an open body such as a shelf, or an opening item, such as a desk (2) with a hinged base, drawers, cupboard or drinks cabinet.

6. A bed unit, according to any of the previous claims, **characterised in that** the carriage (7) has a protu-

berance (22) upward and outward, whose upper part has the axle (6) for hinging with the bed (4), which is at a certain distance from the hinging axle (6), is able to be located in a concealed position, the axle (6) for hinging with the bed being set on a vertical line located roughly $\frac{2}{3}$ along the axle of the outer wheel/s (8) of said axle and $\frac{1}{3}$ along the axle of the inner wheel/s. 5

7. A bed unit, according to any of the previous claims, **characterised in that** the carriage holds a part (14, 15) for covering the zone which constitutes the closing front of said external body in the zone of the hollow space for allowing the bed (4) through, said covering piece (14, 15) being divided into two parts, a lower part (14) fixed to the front part of the carriage (7) and an upper part (15), hinged to the lower part, and which can be folded and backed onto the lower part (14). 10 15

8. A bed unit, according to any of the previous claims, **characterised in that** there is a set of magnets in the surroundings of the cavity (13), able to secure the carriage (7) or pieces connected to this. 20

9. A bed unit, according to any of the previous claims, **characterised in that** it also includes, along at least one portion of the length of the bed, a first flat inner horizontal body (16) like a night table. 25

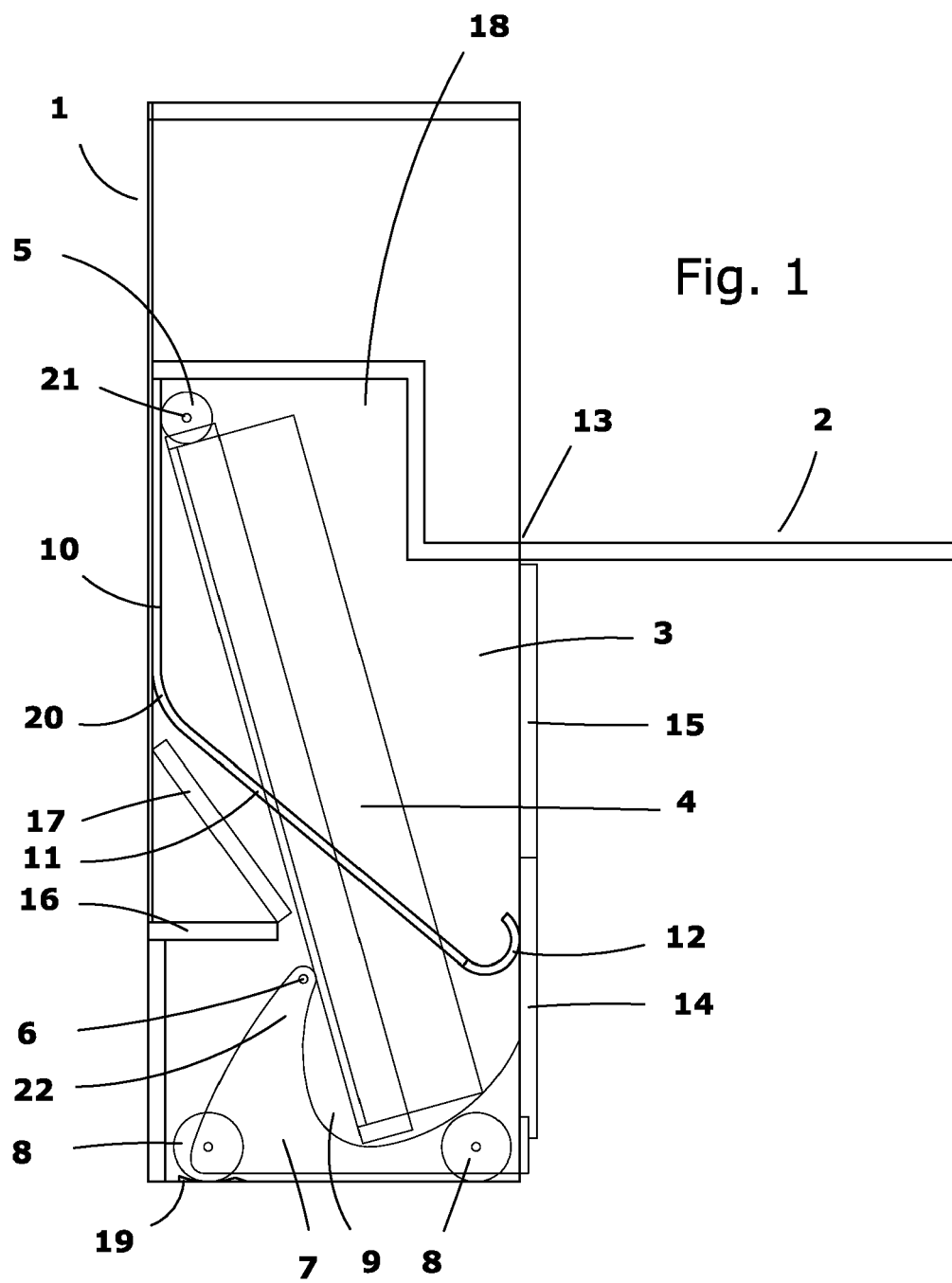
10. A bed unit, according to claim 9, **characterised in that** it also comprises a second flat body (17), hinged in respect of the first flat inner horizontal body. 30

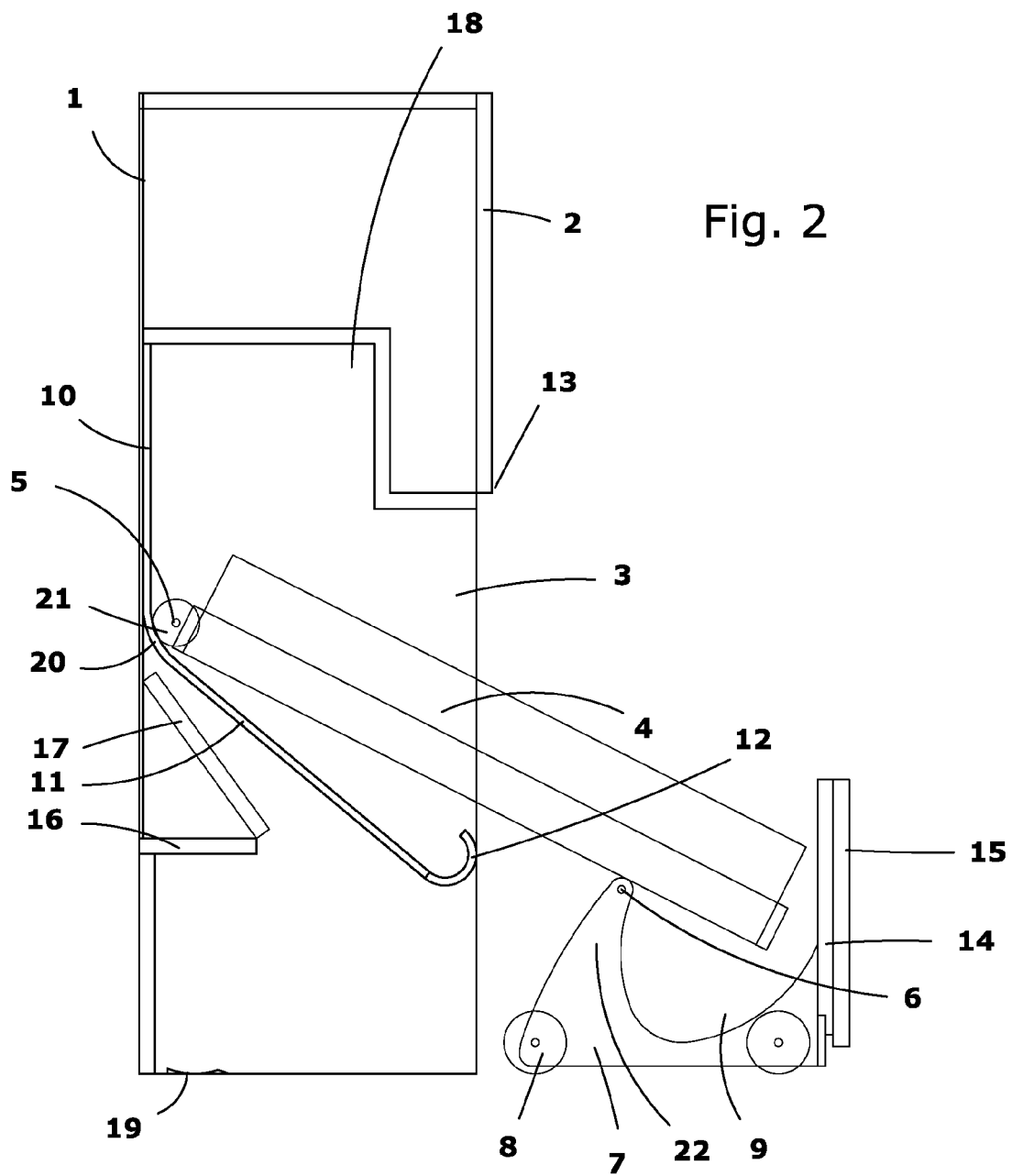
11. A bed unit, according to any of claims 9 and 10, **characterised in that** the upper or lower part of the flat inner horizontal body (16) comprises auxiliary items, such as one or more drawers or shelves. 35

12. A bed unit, according to any of the previous claims, **characterised in that** the rear inner wall of the body (1) is fitted with mechanisms for operating electrical items and/or current sockets. 40

13. A bed unit, according to any of the previous claims, **characterised in that** the furniture unit comprises, backing onto its inner rear wall, a motor with a spool which holds a cable, the end of the cable being secured to a zone close to the lower outer edge of the bed base (4). 45 50

14. A bed unit, according to any of the previous claims, **characterised in that** the bed base (4) comprises a part (23) hinged at least one of its ends, said hinged part (23) able to be manually operated or motor-driven. 55





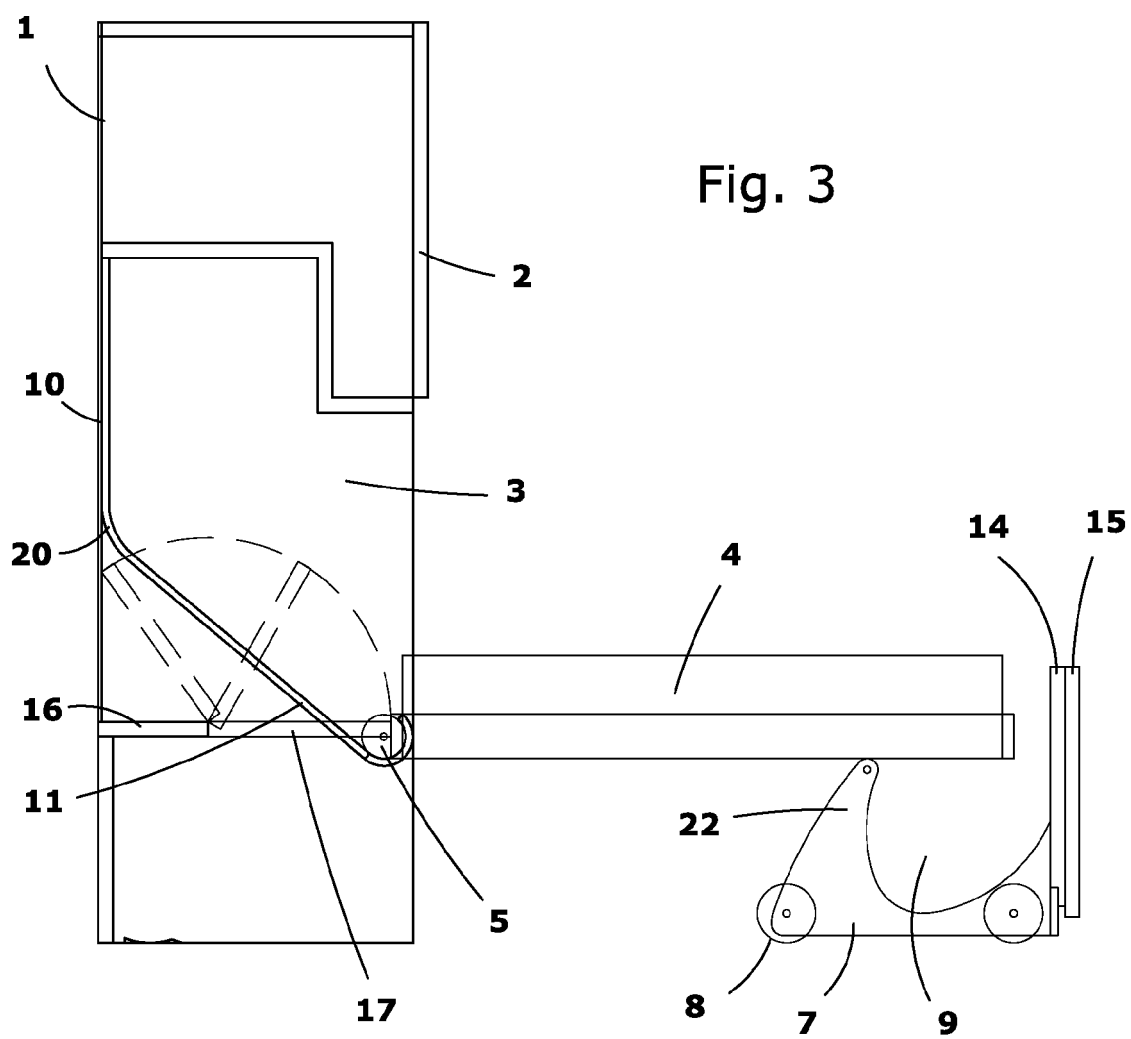


Fig. 4

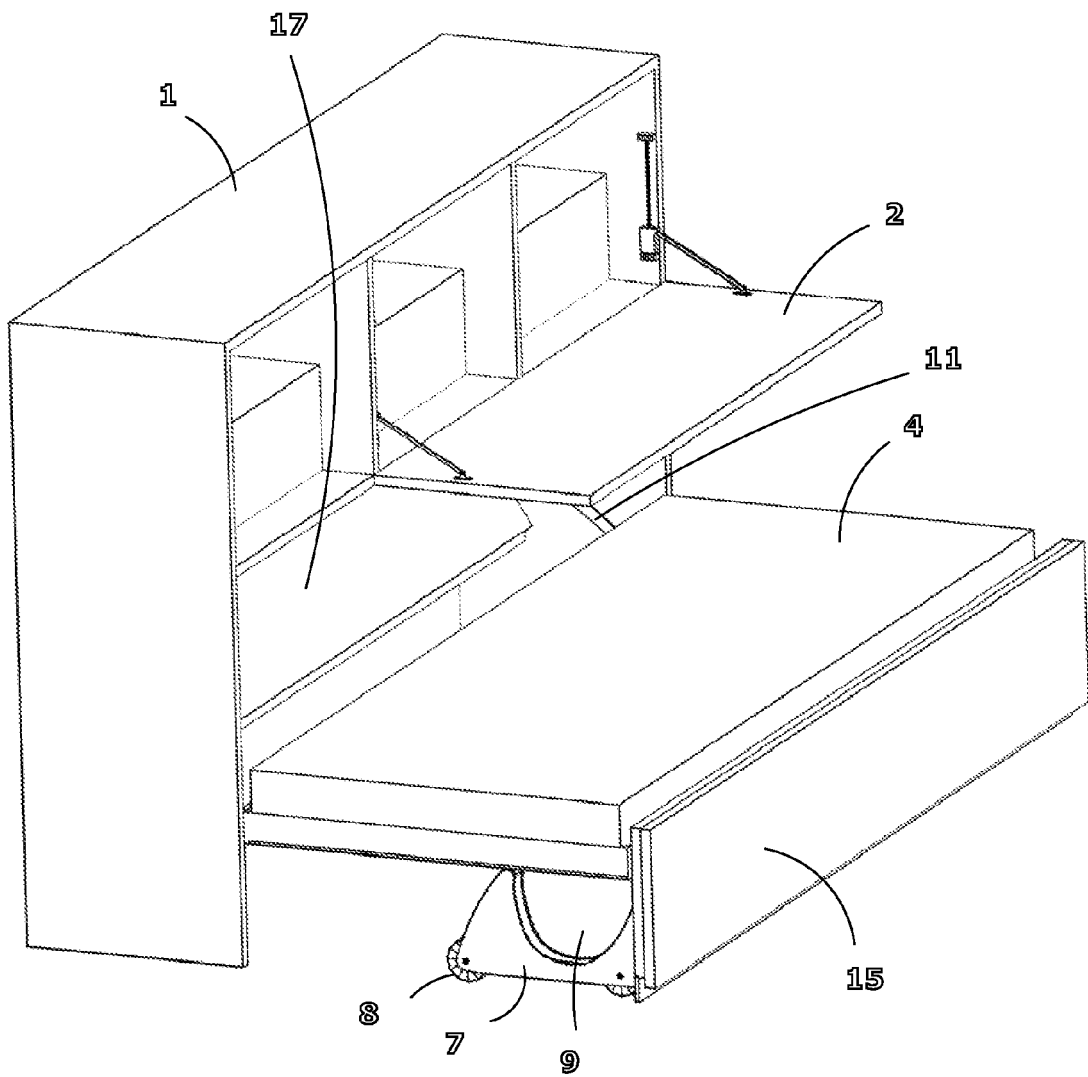
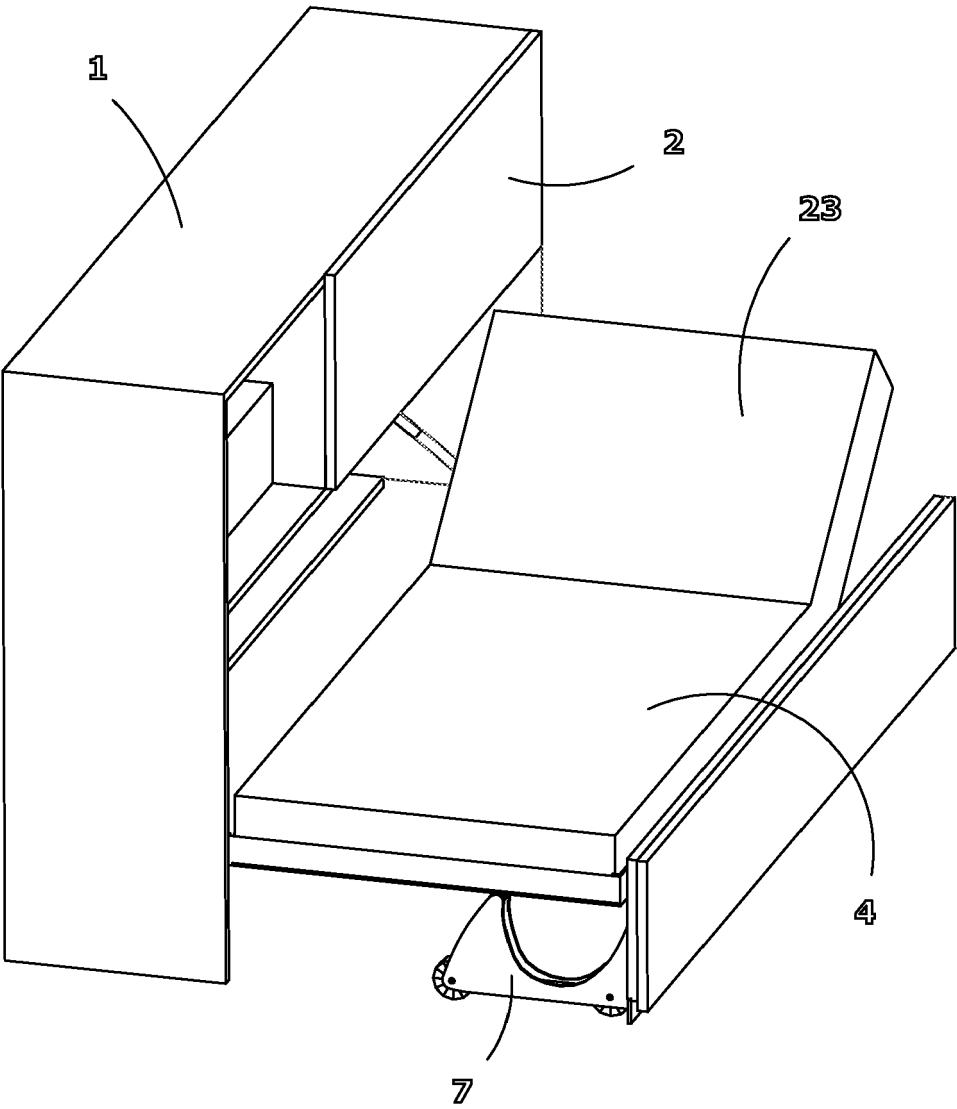


Fig. 5





EUROPEAN SEARCH REPORT

Application Number
EP 10 38 2280

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 21 December 2010	Examiner Kis, Pál
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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EPO FORM 1503 03.82 (P04C01)

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

EP 10 38 2280

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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REFERENCES CITED IN THE DESCRIPTION

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