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(54) Device for opening and closing the door of the body of trucks, trailers and the like

(57) A device for opening and closing the door of the body of trucks, trailers and the like, comprising at least one handle (3) that is rigidly coupled to a bar (4), which is supported so that it can rotate along the door and to which respective pawl-like lugs are rigidly coupled, the handle (3) being associated with a respective base (2) that is rigidly coupled to the door and being manually rotatable from a first angular position for closing the door, in which it is adjacent to the base (2) and in which the pawl-like lugs are engaged in respective locators provided in the chassis of the body, to an angular position for opening the body, in which the handle (3) is substantially spaced from the base (2) and in which the pawl-like lugs are disengaged from the locators so as to allow free rotation of the door about its own axis for pivoting to the body; the base (2) being constituted by at least two portions, which are mutually coupled by way of connecting means (8), a first portion (6) being designed for articulation to the handle (3) and a second portion (7) being designed for fixing to the door and for accommodating means (5) for retaining the handle (3) in the angular position for closing the door.

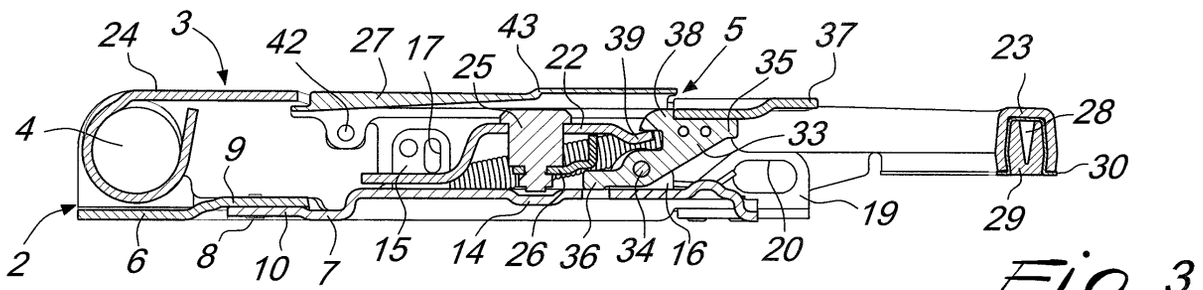

Fig. 3

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Description

[0001] The present invention relates to a device for opening and closing the door of the body of trucks, trailers and the like.

[0002] Devices for opening and closing the doors of trucks and of other high-capacity means of transport are known which are constituted by a handle that is rigidly coupled to a bar that is supported so that it can rotate along the door, preferably with a vertical orientation, and is associated with a base that is fixed to said door, said base further constituting a substantially wraparound receptacle for the handle. The handle can be turned manually from an angular position for closing the door, in which the bar engages, by means of appropriately provided lugs, in respective locators provided on the chassis of the body of the truck, to an angular position for opening the door, in which said lugs are disengaged from the locators, allowing the operator to turn the door freely about its own pivoting axis.

[0003] These devices are currently produced in various sizes, especially as regards the diameter and length of the bars, in order to be installed on vehicles of different capacities and meet different functional requirements. This requires the designer to provide handle bases that are adapted to the dimensions of said handle and are in any case too bulky; the means for retaining the handle in the angular closure position are also fitted on said bases, and this fact often causes an evident waste of materials and time used for manufacture.

[0004] The aim of the present invention is to obviate the above-cited drawbacks, by providing a door opening and closing device that is substantially modular and therefore can be adapted to different body structures and to bars having different diameters and lengths.

[0005] Within this aim, an object of the present invention is to provide a device that is suitable to be produced with the minimum requirement of material.

[0006] Another object of the present invention is to provide a device that is compact and has a shape that does not constitute a danger for the hands of the operator during opening and closing.

[0007] Another object of the present invention is to provide a device that is simple, relatively easy to provide in practice, safe in use, effective in operation, and has a relatively low cost.

[0008] This aim and these and other objects that will become better apparent hereinafter are achieved by the present device for opening and closing the door of the body of trucks, trailers and the like, comprising at least one handle that is rigidly coupled to a bar, which is supported so that it can rotate along the door and to which respective pawl-like lugs are rigidly coupled, said handle being associated with a respective base that is rigidly coupled to the door and being manually rotatable from a first angular position for closing the door, in which it is adjacent to said base and in which said pawl-like lugs are engaged in respective locators provided in the chassis of the body, to an angular position for opening the body, in which said handle is substantially spaced from said base and in which said pawl-like lugs are disengaged from said locators so as to allow free rotation of the door about its own axis for pivoting to the body, characterized in that said base is constituted by at least two portions, which are mutually coupled by way of connecting means, a first one of said portions being adapted to be articulated to said handle and a second one of said portions being adapted to be fixed to the door and accommodating means for retaining said handle in said angular position for closing the door.

[0009] Further characteristics and advantages of the present invention will become better apparent from the following detailed description of a preferred but not exclusive embodiment of a device for opening and closing the door of the body of trucks, trailers and the like according to the invention, illustrated by way of non-limiting example in the accompanying drawings, wherein:

Figure 1 is a perspective view of the device according to the invention, with the handle in the angular closure position;
Figure 2 is a front view of said device;
Figure 3 is a partially sectional bottom view of the device;
Figure 4 is a rear view of the device, i.e., a view taken from the side for fixing to the door.

[0010] In the embodiments that follow, individual characteristics, given in relation to specific examples, may actually be interchanged with other different characteristics that exist in other embodiments.

[0011] Moreover, it is noted that anything found to be already known during the patenting process is understood not to be claimed and to be the subject of a disclaimer.

[0012] With reference to Figure 1, the reference numeral 1 generally designates a device for opening and closing the door of the body of trucks, trailers and the like according to the invention.

[0013] The device, which can be installed on any means of transport provided with a body, comprises a base, generally designated by the reference numeral 2, which is fixed externally to the door of the body (not shown for the sake of simplicity in the figures) and to which a handle, generally designated by the reference numeral 3, for manually opening and closing the door, is articulated. The handle is rigidly coupled to a bar 4, shown in Figure 3, which is preferably supported so that it can rotate along the door and has a plurality of lugs that are suitable to engage in respective locators provided in the body of the chassis.

[0014] The handle 3 can rotate, with respect to the base 2, from a first angular position for closing the door, in which it lies substantially adjacent to the base 2 and is retained by retention means, generally designated by the reference numeral 5, and provided on the base 2,

and in which the lugs of the bar 4 are engaged in the respective locators, locking the door, to an angular opening position, in which the handle 3 is substantially spaced from the base 2 and in which the lugs of the bar are disengaged from the respective locators, allowing the free rotation of the door about its own pivoting axis.

[0015] According to the invention, the base 2 of the device is constituted by a first portion 6 and by a second portion 7, which are mutually coupled by way of removable connection means 8; the first portion 6 is designed for articulation to the handle 3 and the second portion 7 is designed to accommodate the retention means 5. This is particularly advantageous, since it allows to make the second portion 7 interchangeable with the first portions 6 having different dimensions and characteristics, i.e., suitable to be associable with the handles 3 that are connected to the bars 5 that have a different diameter. Moreover, this allows to save on the material used to provide the base 2 for the reasons that will become better apparent hereinafter.

[0016] The first portion 6 and the second portion 7 are advantageously made of thin metal plate, preferably stainless steel; the first portion 6 and the second portion 7 respectively form a first flap 9 and a second flap 10, which are partially mutually superimposed and are mutually fixed by way of the detachable connection means 8 in centering points 8a. The means 8 are preferably constituted by rivets, which are engaged in respective holes 11 that pass through the first and second flaps 9 and 10. As an alternative, the connection means 8 can be constituted, in a fully equivalent manner, by nails or bolts engaged in the holes 11 or by welds between the lower face of the first flap 9 and the upper face of the second flap 10.

[0017] The first portion 6 is folded at sides 12 at right angles, so that its transverse cross-section is substantially U-shaped; each one of the sides 12 of the first portion 6 is affected by a respective circular hole 13, in which a bush 13a, made of antifriction plastic or metallic material, is fitted in order to rotatably support the handle 3.

[0018] The second portion 7 is substantially flat and has a slightly raised central region 14; a first pair of wings 15 and a second pair of wings 16 are provided at the central region 14 by cutting the metal plate and subsequently bending it. In particular, the first pair of wings 15 is affected by slotted openings 17 for locking the handle 3 with respect to the base 2 by means of customs seals.

[0019] Lugs 19, affected by respective slots 20, are rigidly coupled to the second portion 7 by way of removable fixing means 18 constituted for example by nails or rivets.

[0020] Four through holes 21 for fixing the base 2 to the door are preferably provided in the first portion 6 and in the second portion 7.

[0021] The handle 3 is constituted by a central body 22, by a grip end 23, and by an end 24 for articulation to the first portion 6, at which it is connected to the bar 4; the handle 3 is preferably made of bent stainless steel plate. The articulation end 24 has a slightly cambered surface so as to increase the flexural strength of the handle 3: when opening the handle, the operator in fact usually has to apply a considerable manual effort in order to overcome the friction resistance of the gaskets of the door (which are also often stiffened by low temperatures) and turn the handle 3 about the axis of the bar 4.

[0022] The central body 22 is substantially recessed and is provided centrally with a safety lock 25, which actuates a bit 26 for locking the elements 5 for retaining the handle 3 in the closure position. The central body is protected by a flap 27.

[0023] The grip end 23 has a substantially C-shaped transverse cross-section, so as to form a sort of receptacle 28 for the insertion of a plug 29 made of plastic material of the elastically-expanding type, which in turn is accommodated within a sheath 30. The plug 29 conveniently has a substantially ergonomic shape in order to facilitate grip on the part of the operator.

[0024] The articulation end 24 has reduced transverse dimensions so that when the handle 3 is in the angular closing position said end is inserted between the sides 12 of the first portion 6, while the second portion 7 is completely covered by the handle 3. This produces an obvious saving in material in the provision of the second portion 7, which no longer acts as a wraparound receptacle for the handle 3; moreover, this prevents the operator from inadvertently leaving, when closing the handle 3, his fingers between said handle and the base 2, injuring himself due to the shearing effect of the opposite metal plates.

[0025] The handle 3 is provided with lateral sides 31 that are substantially inclined with respect to the surface of the central body 22, and this configuration gives particular rigidity and flexural strength to the handle so as to meet the requirements described above; moreover, the sides 31 are affected by respective longitudinal grooves 32 with comers having a minimum radius, which increase the transverse cross-section of the lateral sides 31 and therefore their flexural strength during the opening of the handle 3. Moreover, slotted openings 32a are provided along the lateral sides 31, and when the handle 3 is in the angular closure position, the openings are located at the slots 20 in order to apply security padlocks or customs seals.

[0026] The means 5 for retaining the handle 3 in the angular closure position comprise a rocker 33, which is keyed on a pivot 34 that is supported rotatably in the second pair of wings 16 and forms a first end portion 35 and a second end portion 36. The first end portion 35, to which an actuation button 37 is connected by means of nails, forms a tooth 38, which is suitable to abut, when the handle 3 is in the angular closure position, against an edge 39 of the central body 22. The second end portion 36 is instead locked by the bit 26 of the lock 25. The rocker 33 is kept in the position for retaining the handle

3 by two coiled springs 40, which are keyed on the pivot 34.

[0027] The button 37 for actuating the retention means 5 is preferably made of a metallic alloy, such as a zinc-aluminum-magnesium alloy, and is affected by a sort of central ergonomic recess 41 for the insertion of the operator's finger. As an alternative, the actuation button 37 can also be made of another metallic alloy or of plastic material.

[0028] The flap 27, conveniently retained by return springs, is articulated to the handle 3 about an axis 42 preferably by way of removable elastically deformable articulation means and continues up to the button 37; at the recess 41 of the button, the flap 27 forms a raised ergonomic portion 43 to facilitate the insertion of the operator's finger.

[0029] The device comprises two springs 44 for retaining the handle 3 in the angular closure position, the ends of the springs being rigidly coupled to first and second pairs of eyes 45 and 46, which are respectively rigidly coupled to the base 2 and to the handle 3.

[0030] The method of use of the device according to the invention is as follows. Assuming that the handle 3 is in the angular closure position of the door, in order to open it it is necessary to lift the flap 27, act on the lock 25 in order to turn the bit 26 (so as to eliminate the locking of the second end portion 36 of the rocker 33), and then apply manual pressure to the button 37: in this manner, the rocker 33 can rotate about the axis of the pivot 34 and the tooth 38 can move away from the edge 39 of the central body 22, so as to allow the manual rotation of the handle 3 from the angular closure position to the opening position.

[0031] It has thus been shown that the invention achieves the intended aim and objects. In particular, it is noted that the device allows to provide a hitherto unattained high modularity of the components for fitting to the body of the truck, with reference to the use of the same base 2 (in particular of the second portion 7) with bars 4 having a different diameter and also with handles 3 having different shapes and characteristics.

[0032] The invention thus conceived is susceptible of numerous modifications and variations, all of which are within the scope of the appended claims.

[0033] All the details may further be replaced with other technically equivalent ones.

[0034] In practice, the materials used, as well as the shapes and dimensions, may be any according to requirements without thereby abandoning the scope of the protection of the appended claims.

[0035] The disclosures in Italian Utility Model Application No. BO2003U000118 from which this application claims priority are incorporated herein by reference.

[0036] Where technical features mentioned in any claim are followed by reference signs, those reference signs have been included for the sole purpose of increasing the intelligibility of the claims and accordingly, such reference signs do not have any limiting effect on the interpretation of each element identified by way of example by such reference signs.

Claims

1. A device for opening and closing the door of the body of trucks, trailers and the like, comprising at least one handle (3) that is rigidly coupled to a bar (4), which is supported so that it can rotate along the door and to which respective pawl-like lugs are rigidly coupled, said handle (3) being associated with a respective base (2) that is rigidly coupled to the door and being manually rotatable from a first angular position for closing the door, in which it is adjacent to said base (2) and in which said pawl-like lugs are engaged in respective locators provided in the chassis of the body, to an angular position for opening the body, in which said handle (3) is substantially spaced from said base (2) and in which said pawl-like lugs are disengaged from said locators so as to allow free rotation of the door about its own axis for pivoting to the body, **characterized in that** said base (2) is constituted by at least two portions, which are mutually coupled by way of connecting means (8), a first one (6) of said portions being adapted to be articulated to said handle (3) and a second one (7) of said portions being adapted to be fixed to the door and accommodating means (5) for retaining said handle (3) in said angular position for closing the door.

2. The device according to claim 1, **characterized in that** said first and second portions (6) and (7) are made of thin metal plate.

3. The device according to claims 1 and 2, **characterized in that** said first and second portions (6, 7) of said base (2) form respectively a first flap (9) and a second flap (10), which are partially mutually superimposed and are coupled by way of said connecting means (8).

4. The device according to one or more of the preceding claims, **characterized in that** said connecting means (8) are constituted by rivets engaged in respective holes (11) that pass through said first and second flaps (9, 10).

5. The device according to one or more of claims 1 to 3, **characterized in that** said connecting means (8) are constituted by nails that engage in respective holes (11) that pass through said first and second flaps (9, 10).

6. The device according to one or more of claims 1 to 3, **characterized in that** said connecting means (8) are constituted by bolts that engage in respective

holes (11) that pass through said first and second flaps (9, 10).

7. The device according to one or more of claims 1 to 3, **characterized in that** said connecting means (8) are constituted by spot welds applied between the lower face of said first flap (9) and the upper face of said second flap (10).

8. The device according to one or more of the preceding claims, **characterized in that** said first portion (6) is folded at the sides (12) so that it has a substantially U-shaped transverse cross-section, and is affected, at said sides, by circular holes (13) provided with bushes (13a) for rotatably supporting said handle (3).

9. The device according to one or more of the preceding claims, **characterized in that** said handle (3) is constituted by a central body (22), by a grip end (23) and by an end (24) for articulation to said first portion (6), all made of bent and shaped metal plate, said articulation end (24) having reduced transverse dimensions so as to fit, in said first angular position, between said sides (12) of said first portion (6), thus preventing the accidental interposition of the operator's fingers between said handle (3) and said base (2) during closure.

10. The device according to one or more of the preceding claims, **characterized in that** said articulation end (24) has a slightly cambered surface so as to give said handle (3) high flexural strength during opening.

11. The device according to one or more of the preceding claims, **characterized in that** said grip end (23) has a substantially C-shaped transverse cross-section, so as to form a receptacle (28) for inserting a respective plug (29).

12. The device according to one or more of the preceding claims, **characterized in that** said plug (29) is of the elastically expanding type for locking within said receptacle (28).

13. The device according to one or more of the preceding claims, **characterized in that** said plug (29) is accommodated within a sheath (30).

14. The device according to one or more of the preceding claims, **characterized in that** said handle (3) has lateral stiffening sides (31) that are substantially inclined with respect to the plane of said central body (22), so as to give said handle (3) high flexural strength during opening.

15. The device according to one or more of the preceding claims, **characterized in that** said sides (31) are affected by respective longitudinal grooves (32), which are adapted to give high flexural strength to said handle (3) during opening.

16. The device according to one or more of the preceding claims, **characterized in that** said central body (22) is associated with a central flap (27) for protecting a security lock (25) for locking said handle (3) in said second angular closure position, a button (37) being adjacent to said flap (27) in order to actuate said retention means (5), said button (37) being affected by a central ergonomic recess (41) for the insertion of a finger of the operator, an ergonomic raised portion (43) being provided in said flap (27) at said recess (41) in order to facilitate insertion of the finger.

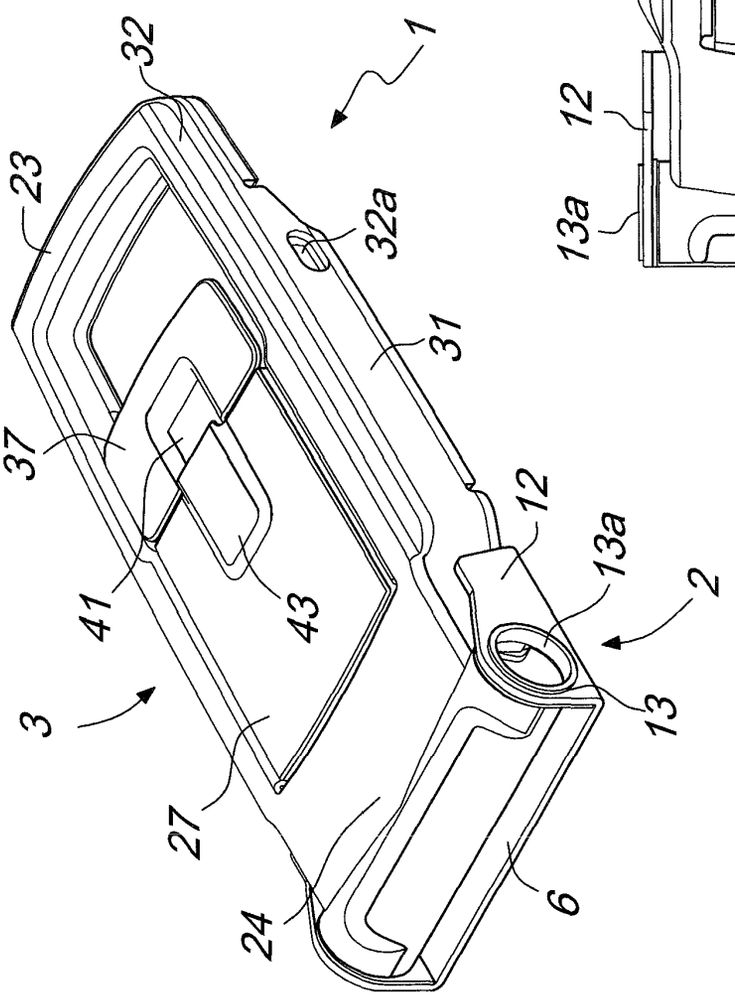
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Fig. 1

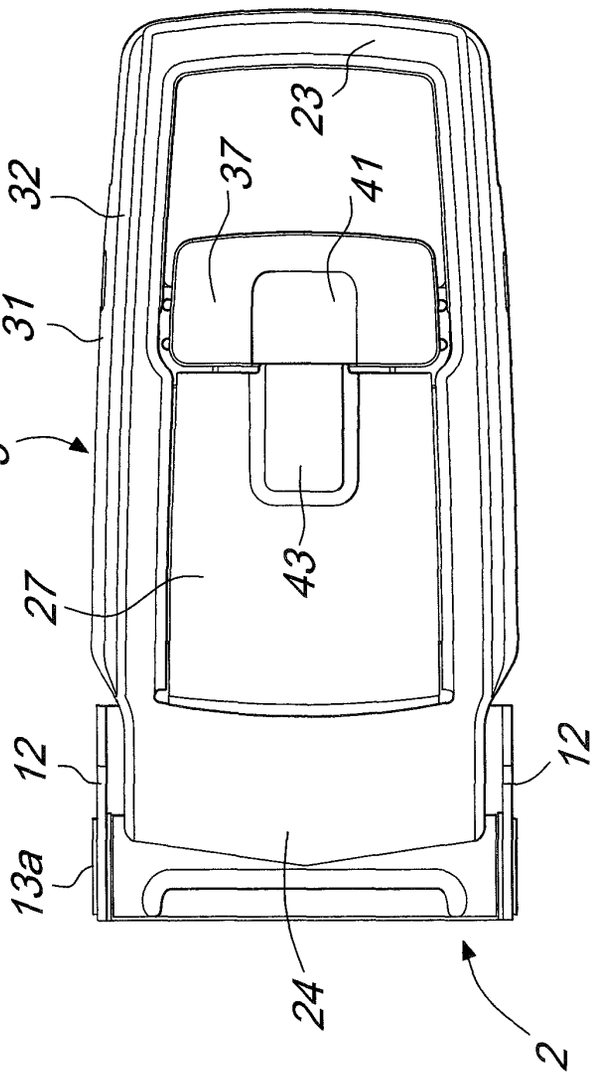
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Fig. 2

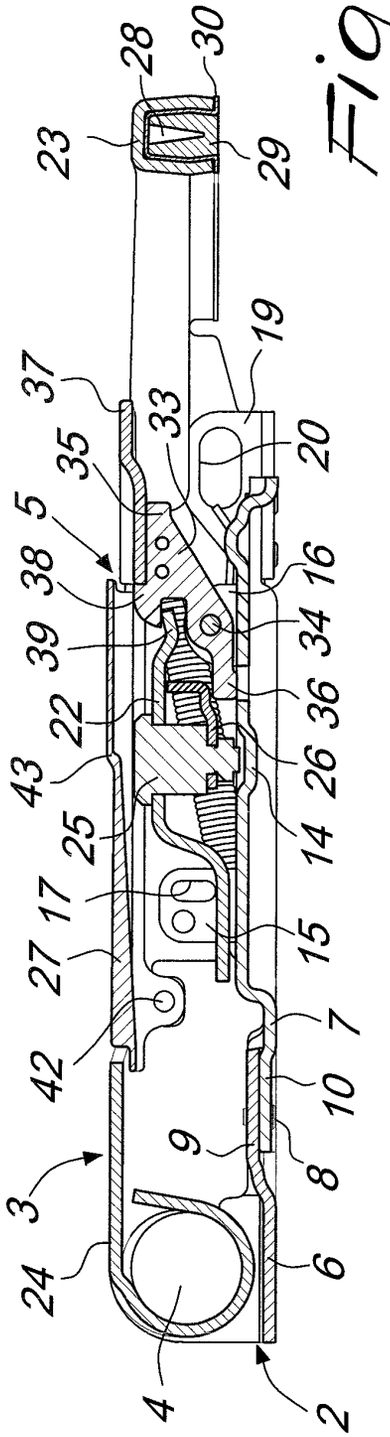
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Fig. 3

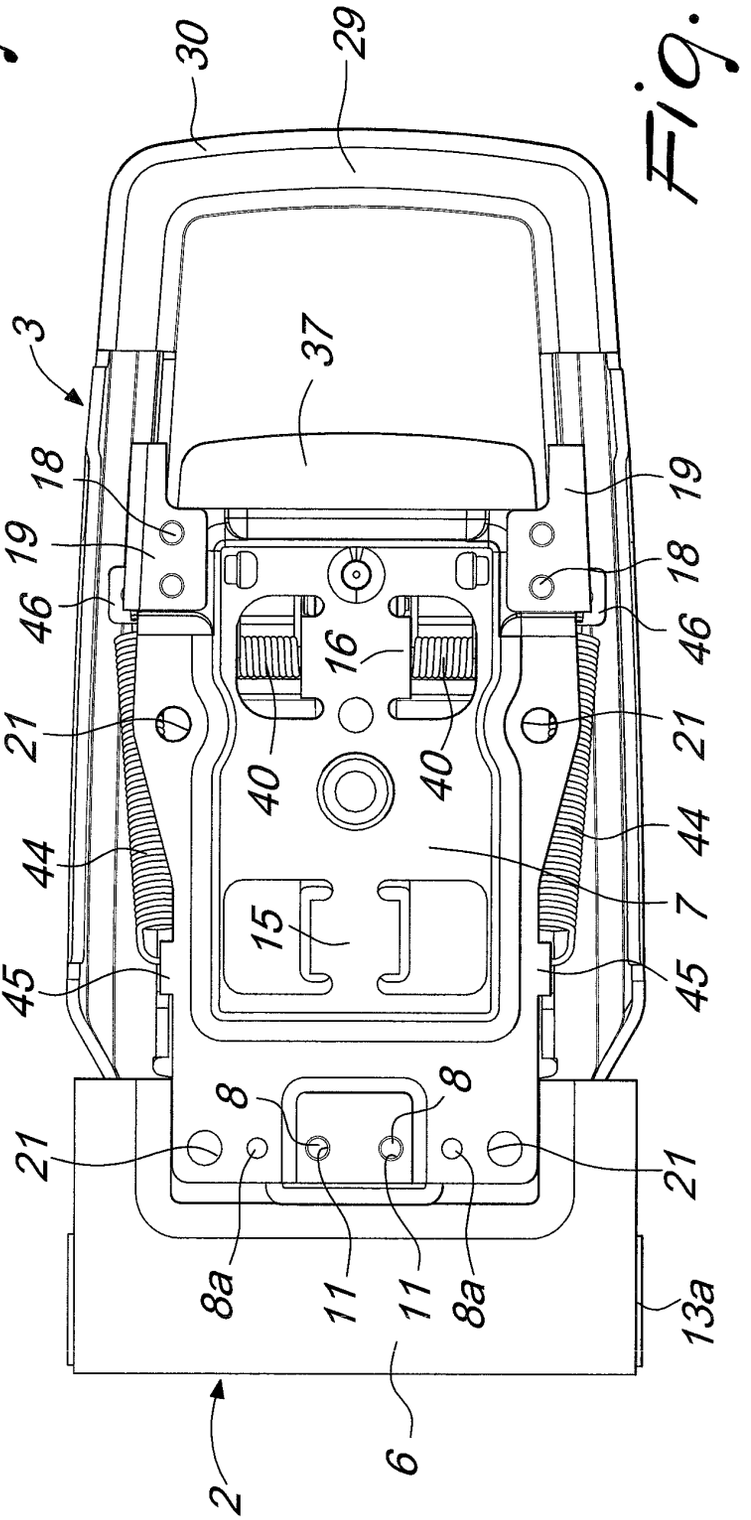
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Fig. 4

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 04 10 5306

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
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A	DE 22 13 790 A1 (FA. CARL FUHR, 5628 HEILIGENHAUS) 27 September 1973 (1973-09-27) * page 7, line 13 - line 17; figures 2,3 *	1,2,8,9, 16	

TECHNICAL FIELDS SEARCHED (Int.Cl.7)

E05B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	11 February 2005	PEREZ MENDEZ, J

CATEGORY OF CITED DOCUMENTS

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