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(54) **An extractable plane**

Eine herausziehbare Fläche

Un plan extractible

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Description

[0001] Specifically, though not exclusively, the extractable plane is usefully applied as special equipment for commercial vehicles such as vans and the like, where it constitutes a useful loading plane, displaceable from the inside to the outside of the vehicle and vice versa.

[0002] Known extractable planes, comprising essentially a frame which is mobile in translation in two directions on a fixed frame, to which the mobile frame is slidably coupled by parallel guides, can perform the task of enabling a desired movement of goods, but usually exhibit the drawback of enabling a stable position (of the mobile loading plane with respect to the fixed part) only in some predetermined positions, in which positions a mechanical blocking, normally a friction blocking of some kind, is used to prevent relative movement of the mobile loading plane and the fixed part. When not in one of these predetermined positions, the mobile loading plane is free to slide on the fixed part.

[0003] This is the cause of numerous drawbacks which can emerge during normal use of the known-type extractable planes and means that in order to work with an acceptable degree of security the plane must be located in one of the predetermined positions, where blocking is guaranteed.

[0004] From WO 01/21040 A a pull-out shelf is known with means which allow stepless locking of the shelf in optional positions between an inner and an outer end position.

[0005] The main aim of the present invention is to realise an extractable plane which obviates the above-described drawbacks and limitations in the prior art.

[0006] An advantage of the invention is its simplicity.

[0007] A further advantage of the invention represented by the ease with which the operation can perfectly safely position the extractable loading plane in the desired position.

[0008] These aims and advantages and more besides are attained by the present invention, as it is characterised in the appended claims.

[0009] Further characteristics and advantages of the present invention will better emerge from the detailed description that follows, of a preferred but nonlimiting example of the invention, in a preferred but non-exclusive embodiment thereof, illustrated by way of example in the accompanying figures of the drawings, in which:

Figure 1 is a perspective schematic view;

Figure 2 is a partial section made according to plane α ;

Figure 3 is the partial section of figure 2, relating to a different operative configuration;

Figure 4 is a schematic representation in perspective view of an application of the invention on a commercial vehicle.

[0010] With reference to the figures of the drawings,

they show a bottom plane of a commercial vehicle, at which an extractable plane is predisposed, which extractable plane is for moving loads from inside to outside of the vehicle, and vice versa.

[0011] The extractable plane essentially comprises a mobile frame 3 which can translate in two directions on a fixed frame 2, to which the mobile frame 3 is slidably coupled by parallel guides, from a position in which it is situated completely internally of the loading chamber of the vehicle, to a position in which it is located outside the vehicle, and vice versa.

[0012] In a first embodiment of the invention, the fixed frame 2 is characterised in that it comprises at least a longitudinal hollow seating 20, parallel to an extraction direction thereof, exhibiting a longitudinal groove 21 having a smaller width than a width of the hollow seating 20. The hollow seating 20 is of such a size as to house internally thereof, with a predetermined amount of play, a simple bar 4 which exhibits an end thereof fixed to the mobile frame 3 and bears, solidly fixed thereto, an appendage which is laterally (or radially) projecting 40, which appendage 40 is predisposed and of such a size as to exit freely from the longitudinal groove 21. The projecting appendage 40 can be arched, i.e. hook-shaped.

[0013] Special elastic means, interacting with the mobile frame 3, maintain the bar 4 rotated about an axis thereof in at least one blocking position (see figure 2), in which position the projecting appendage 40 is pressed into contact with an external surface of the fixed frame 2, close to the longitudinal groove 21 so that at least a part of the surface of the bar 4 is pressed against a part of the internal surface delimiting the hollow seating 20. Thus, due to the friction generated by the contact, an axial blocking of the bar 4 to the relative hollow seating 20 obtains, and thus of the mobile frame 3 to the fixed frame 2, which prevents movement of the one in relation to the other.

[0014] Other means, interacting between the mobile frame 3 and the bar 4, are provided for enabling a rotation of the bar 4 about an axis thereof between the blocking position and at least an unblocked position, at which the projecting appendage 40 is freely housed and slidable internally of the longitudinal groove 21.

[0015] In particular, the elastic means preferably comprise a spring 5, predisposed for interacting between the mobile frame 3 and the bar 4 in order to maintain the bar 4 rotated about an axis thereof in the blocked position in which the projecting appendage 40 is pressed in contact against the external surface of the fixed frame 2, close to the longitudinal groove in order that at least a part of the surface of the bar 4 is pressed against a part of the internal surface delimiting the hollow seating 20.

[0016] In terms of construction, the hollow seating 20, parallel to the extraction direction, and the relative longitudinal groove 21, are afforded in a length of shaped element 23 which constitutes an integral part of the fixed frame 2.

[0017] The external surface is thus simply a part of the

external surface of the length of shaped element 23.

[0018] The length of shaped element 23 also affords an open longitudinal hollow seating 24, in which guide and sliding organs are coupled, by means of which the mobile frame 3 is slidably coupled to the length of shaped element 23 in the extraction direction.

[0019] In the illustrated embodiment, two of the shaped elements 23 are included in the fixed frame 2, which two shaped elements 23 are solidly constrained to one another by crossbars, and which two shaped elements 23 are symmetrically arranged with respect to a median longitudinal plane of the fixed frame 2.

[0020] Two lengths of element 33 are part of the mobile frame 3, which lengths of element 33 are identical to the lengths of element 23, are parallel to one another and are also side-by-side with and parallel to the lengths of element 23 and are thus symmetrically arranged with respect to a median longitudinal plane of the mobile frame 3.

[0021] The two lengths of element 33 are also solidly constrained to one another by at least a front crossbar 35 and by at least a back crossbar 36.

[0022] The lengths of element 23 and 33 are reciprocally side-by-side so that the respective open hollow seatings 24 and 34 are reciprocally facing in order to house the guide and sliding organs which are constituted by wheels 27 and 37.

[0023] The wheels 27 are pivoted on the lengths of element 23 and are constrained to roll in the open hollow seatings 34 of the lengths of element 33. The wheels 37 are pivoted on the lengths of element 33 and are constrained to rotate in the open hollow seatings 24 of the lengths of element 23.

[0024] The coupling of the wheels 27 and 37 in the hollow seatings 34 and 24 of the lengths of element 33 and 23 creates a reciprocal constraint of the mobile frame 3 to the fixed frame 2, by virtue of which the mobile frame 3 can move only guidedly with respect to the fixed frame 2 in a parallel direction to the lengths of element 23.

[0025] In the preferred embodiment, each of the hollow seatings 20 houses, with a predetermined amount of play, a bar 4 which exhibits an end which is axially fixed to the front crossbar 35 of the mobile frame 3 and bears, solidly constrained thereto, a projecting appendage 40.

[0026] At the ends of the bars 4, small levers 41 are constrained only axially to the crossbar 35; the small levers 41 enable a manually-commanded partial rotation of the bars 40, by an amount which is sufficient to bring them from the blocked position (in which the projecting appendage 40 is pressed in contact with the external surface close to the longitudinal groove 21 so that, by contract, at least a part of the surface of the bar 4 is pressed against a part of the internal surface delimiting the hollow seating 20), into the unblocked position (in which the single projecting appendage 40 is freely housed and slidable internally of the corresponding longitudinal groove 21).

[0027] The ergonomic arrangement of the levers 41

enables the user to manoeuvre the levers 41 using the same grip as on the crossbar 35 for displacing the mobile frame 3 with respect to the fixed frame 2.

[0028] On releasing the levers 41, the rotation induced on the bars 4 by the springs 5 immediately blocks the mobile frame 3 with respect to the fixed frame 2, in any position of extraction.

[0029] Also included, though not illustrated in the accompanying figures, is the creation of some blocking positions (for example endrun) achieved by friction connections between the projecting appendage 40 and the length of element 23. A blocking of this type is very simply achieved by including, at the desired blocking positions, incisions on the edges of the longitudinal grooves 21 in which the projecting appendages can be inserted.

Claims

1. An extractable plane comprising a frame which is mobile in translation in two directions on a fixed frame, to which the mobile frame is slidably coupled by means of parallel guides, **characterised in that** the fixed frame (2) comprises at least a longitudinal hollow seating (20) which is parallel to an extraction direction of the mobile frame (3), exhibiting a longitudinal groove (21) having a smaller width than a width of the hollow seating (20); the hollow seating (20) housing a bar (4) internally thereof, with a predetermined amount of play, which bar (4) exhibits an end thereof which is fixed to the mobile frame (3) and bears, solidly constrained thereto, a laterally projecting appendage (40) which is predisposed and dimensioned in order to exit freely from the longitudinal groove (21); elastic means being provided, interacting with the mobile frame (3), for maintaining the bar (4) rotated about an axis thereof in at least a blocking position at which the projecting appendage (40) is pressed in contact with an external surface of the fixed frame (2), close to the longitudinal groove (21), and at least a part of the surface of the bar (4) is pressed against a part of an internal surface delimiting the hollow seating (20); means being provided, interacting with the mobile frame (3), for producing a rotation of the bar (4) about the axis thereof, between the at least a blocking position and at least an unblocked position in which unblocked position the projecting appendage (40) is freely housed and slidable internally of the longitudinal groove (21).
2. The extractable plane of claim 1, **characterised in that** the elastic means comprise a spring (5), which is predisposed to interact between the mobile frame (3) and the bar (4) so as to maintain the bar (4) rotated about an axis thereof in the blocking position, in which blocking position the projecting appendage (40) is pressed in contact with the external surface of the fixed frame (2) close to the longitudinal groove

(21) and at least a part of the surface of the bar (4) is pressed against a part of an internal surface delimiting the hollow seating (20).

3. The extractable plane of claim 2, **characterised in that** the hollow seating (20), parallel to the extraction direction, and the relative longitudinal groove (21) are afforded in a length of element (23) which constitutes an integral part of the fixed frame (2); the external surface being a part of the external surface of the length of element (23). 5
4. The extractable plane of claim 3, **characterised in that** the length of element (23) affords a longitudinal hollow seating (24), in which guide and sliding organs are coupled, by means of which guide and sliding organs the mobile frame (3) is slidably coupled to the length of element (23), in the extraction direction. 10
5. The extractable plane of claim 3 or 4, **characterised in that** two of the lengths of element (23) are an integral part of the fixed frame (2), which two lengths of element (23) are solidly joined to one another by crossbars and are symmetrically arranged with respect to a longitudinal median plane of the fixed frame (2). 15
6. The extractable plane of claim 5, **characterised in that** two of the lengths of element (33) are an integral part of the mobile frame (3), which two lengths of element (33) are identical to the lengths of element (23), are parallel to one another and are parallel side-by-side with the two lengths of element (23) in order to be symmetrically arranged with respect to a median longitudinal plane of the mobile frame (3); the two lengths of element (33) also being solidly constrained one to another by at least a front crossbar (35) and by at least a back crossbar (36). 20
7. The extractable plane of claim 6, **characterised in that** the lengths of element (23, 33) are reciprocally side-by-side in order that the open hollow seatings (24, 34) are reciprocally facing one another; the guide and sliding organs being constituted by wheels (27, 37); the wheels (27) being pivoted to the lengths of element (23) and being constrained to roll in the open hollow seatings (34) of the lengths of element (33); the wheels (37) being pivoted to the lengths of element (33) and being constrained to roll in the open hollow seatings (24) of the lengths of element (23). 25
8. The extractable plane of claim 7, **characterised in that** each of the hollow seatings (20) houses, with a predetermined amount of play, a bar (4) which exhibits an end which is axially fixed to the front crossbar (35) of the mobile frame (3) and bears, solidly constrained thereto, a laterally projecting appendage (40). 30

age (40).

9. The extractable plane of claim 8, **characterised in that** levers (41) are solidly constrained to the ends of the bars (4) which are axially constrained to the crossbar (35), which levers (41) enable a manual rotation of the bars (40) to bring them from the blocking position in which the projecting appendage (4) is pressed in contact with the external surface close to the longitudinal groove (21) and at least a part of the surface of the bar (4) is pressed against a part of the internal surface delimiting the hollow seating (20), into the unblocking position in which each projecting appendage (40) is freely housed and slidable internally of a corresponding longitudinal slot (21). 35

Patentansprüche

1. Herausziehbare Fläche, die einen Rahmen umfasst, der quer in zwei Richtungen auf einem festen Rahmen beweglich ist, an den der bewegliche Rahmen gleitfähig über parallele Führungen angeschlossen ist, **dadurch gekennzeichnet, dass** der feste Rahmen (2) mindestens eine hohle Längsaufnahme (20) umfasst, die parallel zu einer Ausziehrichtung des beweglichen Rahmens (3) angeordnet ist und eine Längsrille (21) aufweist, die schmaler ist als die Breite der hohlen Aufnahme (20); die hohle Aufnahme (20) nimmt innenliegend mit einem vorgegebenen Spiel einen Stab (4) auf, wobei dieser Stab (4) ein Ende, das am beweglichen Rahmen (3) fixiert ist, und fest damit verbunden einen seitlichen Vorsprung (40) aufweist, der so ausgelegt und bemessen ist, dass er frei aus der Längsrille (21) herausragt; vorgesehen sind elastische Mittel, die mit dem beweglichen Rahmen (3) zusammenwirken, um den Stab (4) um eine eigene Achse gedreht in mindestens einer Blockierposition beizubehalten, in der der Vorsprung (40) in Kontakt zu einer Außenfläche des festen Rahmens (2), nahe an der Längsrille (21), gepresst wird und mindestens ein Teil der Fläche des Stabs (4) gegen einen Teil der Innenfläche, die die hohle Aufnahme (20) begrenzt, gepresst wird; vorgesehen sind Mittel, die mit dem beweglichen Rahmen (3) zusammenwirken, um eine Drehung des Stabs (4) um seine eigene Achse zwischen der mindestens einen Blockierposition und mindestens einer nicht blockierten Position zu erzeugen, wobei der Vorsprung (40) in der nicht blockierten Position frei innenliegend in der Längsrille (21) gleiten kann. 40
2. Herausziehbare Fläche nach Anspruch 1, **dadurch gekennzeichnet, dass** die elastischen Mittel eine Feder (5) aufweisen, die so ausgelegt ist, dass sie zwischen dem beweglichen Rahmen (3) und dem Stab (4) wirkt, um den Stab (4) um seine eigene Achse gedreht in der Blockierposition beizubehalten, 45

wobei der Vorsprung (40) in dieser Blockierposition in Kontakt zur Außenfläche des festen Rahmens (2) nahe an der Längsrille (21) gepresst wird und mindestens ein Teil der Fläche des Stabs (4) gegen einen Teil der Innenfläche, die die hohle Aufnahme (20) begrenzt, gepresst wird.

3. Herausziehbare Fläche nach Anspruch 2, **dadurch gekennzeichnet, dass** die hohle Aufnahme (20), parallel zur Ausziehrichtung, und die entsprechende Längsrille (21) aus einer Elementlänge (23) ausgebildet sind, die einen wesentlichen Bestandteil des festen Rahmens (2) bildet; die Außenfläche ist dabei ein Teil der Außenfläche der Elementlänge (23).

4. Herausziehbare Fläche nach Anspruch 3, **dadurch gekennzeichnet, dass** die Elementlänge (23) eine hohle Längsaufnahme (24) ausbildet, in der Führungs- und Gleitorgane gekoppelt sind, wobei der bewegliche Rahmen (3) mit Hilfe dieser Führungs- und Gleitorgane gleitfähig mit der Elementlänge (23) in der Ausziehrichtung verbunden ist.

5. Herausziehbare Fläche nach Anspruch 3 oder 4, **dadurch gekennzeichnet, dass** die Elementlängen (23) einen wesentlichen Bestandteil des festen Rahmens (2) bilden, wobei die zwei Elementlängen (23) fest durch Querbalken miteinander verbunden sind und symmetrisch zu einer mittigen Längsfläche des festen Rahmens (2) ausgerichtet sind.

6. Herausziehbare Fläche nach Anspruch 5, **dadurch gekennzeichnet, dass** zwei der Elementlängen (23) einen wesentlichen Bestandteil des festen Rahmens (2) bilden, wobei die zwei Elementlängen (33) identisch mit den Elementlängen (23) sind, parallel zueinander stehen und parallel neben den zwei Elementlängen (23) angeordnet sind, um symmetrisch zur mittigen Längsfläche des beweglichen Rahmens (3) zu liegen; die beiden Elementlängen (33) sind durch mindestens einen vorderen Querbalken (35) und mindestens einen hinteren Querbalken (36) fest miteinander verbunden.

7. Herausziehbare Fläche nach Anspruch 6, **dadurch gekennzeichnet, dass** die Elementlängen (23, 33) gegenseitig nebeneinander liegen, damit die offenen hohlen Aufnahmen (24, 34) gegenseitig einander zugewandt sind; die Führungs- und Gleitorgane bestehen aus Rädern (27, 37); die Räder (27) werden zu den Elementlängen (23) gedreht und müssen in den offenen hohlen Aufnahmen (34) der Elementlängen (33) rollen; die Räder (37) werden zu den Elementlängen (33) gedreht und müssen in den offenen hohlen Aufnahmen (24) der Elementlängen (23) rollen.

8. Herausziehbare Fläche nach Anspruch 7, **dadurch gekennzeichnet, dass** jede der hohlen Aufnahmen

(20), mit einem bestimmten Spiel, einen Stab (4) aufnimmt, der ein Ende, das axial zum vorderen Querbalken (35) des beweglichen Rahmens (3) fixiert ist, und fest damit verbunden einen seitlichen Vorsprung (40) aufweist.

9. Herausziehbare Fläche nach Anspruch 8, **dadurch gekennzeichnet, dass** Hebel (41) fest mit den Enden der Stäbe (4) verbunden sind, die axial mit dem Querbalken (35) verbunden sind, wobei die Hebel (41) eine manuelle Drehung der Stäbe (40) von der Blockierposition, in der der Vorsprung in Kontakt zur Außenfläche nahe an der Längsrille (21) gepresst wird und mindestens ein Teil der Fläche des Stabs (4) gegen einen Teil der Innenfläche gepresst wird, die die hohle Aufnahme (20) begrenzt, in die nicht blockierte Position, in der jeder Vorsprung (40) in die nicht blockierte Position, in der jeder Vorsprung (40) frei innenliegend in einem entsprechenden Längsschlitz (21) gleiten kann.

Revendications

1. Plan extractible composé d'un châssis mobile se déplaçant dans deux sens sur un châssis immobile, auquel le châssis mobile est attaché de façon coulissante par le biais de rails parallèles, **caractérisé en ce que** le châssis immobile (2) comprend au moins un logement creux longitudinal (20) parallèle au sens d'extraction du châssis mobile (3), présentant une rainure longitudinale (21) d'une plus petite largeur que la largeur du logement creux (20) ; le logement creux (20) accueille à l'intérieur une barre (4) avec un jeu préétabli, laquelle barre (4) présente une extrémité fixée au châssis mobile (3) et est solidaire d'un prolongement en saillie latérale (40), prédisposé et dimensionné de façon à sortir librement de la rainure longitudinale (21) ; des dispositifs élastiques sont prévus pour interagir avec le châssis mobile (3) et maintenir la barre (4) pivotant autour de son propre axe dans une position de blocage au moins, dans laquelle le prolongement en saillie (40) s'appuie contre une surface externe du châssis immobile (2), à proximité de la rainure longitudinale (21), et au moins une partie de la surface de la barre (4) s'appuie contre une partie de la surface interne délimitant le logement creux (20) ; des dispositifs sont prévus pour interagir avec le châssis mobile (3) pour entraîner une rotation de la barre (4) autour de son propre axe entre la position de blocage au moins et une position de déblocage au moins, dans laquelle le prolongement en saillie (40) est librement logé et coulisse à l'intérieur de la rainure longitudinale (21).
2. Plan extractible de la revendication 1, **caractérisé en ce que** les dispositifs élastiques comprennent un ressort (5), prédisposé pour interagir entre le châssis

mobile (3) et la barre (4) afin de maintenir la barre (4) pivotant autour de son propre axe dans la position de blocage, dans laquelle le prolongement en saillie (40) s'appuie contre la surface externe du châssis immobile (2), à proximité de la rainure longitudinale (21), et au moins une partie de la surface de la barre (4) s'appuie contre une partie de la surface interne délimitant le logement creux (20).

3. Plan extractible de la revendication 2, **caractérisé en ce que** le logement creux (20), parallèle au sens d'extraction, et la rainure longitudinale respective (21) consistent en un morceau de profilé (23), qui fait partie intégrante du châssis immobile (2); la surface externe faisant partie de la surface externe du morceau de profilé (23). 10
4. Plan extractible de la revendication 3, **caractérisé en ce que** le morceau de profilé (23) présente un logement creux longitudinal (24), dans lequel sont fixés un rail et des organes de coulissement, et par l'intermédiaire de ce rail et des organes de coulissement, le châssis mobile (3) est attaché de façon coulissante au morceau de profilé (23), dans le sens d'extraction. 20
5. Plan extractible de la revendication 3 ou 4, **caractérisé en ce que** deux des morceaux de profilé (23) font partie intégrante du châssis immobile (2), les deux morceaux de profilé (23) étant solidaires l'un de l'autre par le biais de traverses et disposés symétriquement au plan médian longitudinal du châssis immobile (2). 30
6. Plan extractible de la revendication 5, **caractérisé en ce que** deux des morceaux de profilé (33) font partie intégrante du châssis mobile (3), les deux morceaux de profilé (33) étant identiques aux morceaux de profilé (23), parallèles entre eux, placés latéralement et parallèlement aux deux morceaux de profilé (23), de façon à être disposés symétriquement au plan médian longitudinal du châssis mobile (3); les deux morceaux de profilé (33) sont aussi solidaires l'un de l'autre par le biais d'au moins une traverse avant (35) et d'au moins une traverse arrière (36). 40
7. Plan extractible de la revendication 6, **caractérisé en ce que** les morceaux de profilé (23, 33) sont situés à côté l'un de l'autre, de façon à ce que les logements creux ouverts (24, 34) se trouvent en face l'un de l'autre; le rail et les organes de coulissement sont constitués de roues (27, 37); les roues (27) sont montées sur un pivot sur les morceaux de profilé (23) et contraintes de rouler dans les logements creux ouverts (34) des morceaux de profilé (33); les roues (37) sont montées sur un pivot sur les morceaux de profilé (33) et contraintes de rouler dans les logements creux ouverts (24) des morceaux de 50

profilé (23).

8. Plan extractible de la revendication 7, **caractérisé en ce que** chaque logement creux (20) accueille, avec un jeu préétabli, une barre (4) présentant une extrémité, fixée axialement à la traverse avant (35) du châssis mobile (3) et solidaire d'un prolongement en saillie latérale (40). 5
9. Plan extractible de la revendication 8, **caractérisé en ce que** des leviers (41) sont solidaires des extrémités des barres (4), axialement fixées à la traverse (35), lesquels leviers (41) permettent une rotation manuelle des barres (40) pour les faire passer de la position de blocage, dans laquelle le prolongement en saillie s'appuie contre la surface externe à proximité de la rainure longitudinale (21) et au moins une partie de la surface de la barre (4) s'appuie contre une partie de la surface interne délimitant le logement creux (20), à la position de déblocage, dans laquelle chaque prolongement en saillie (4) est librement logé et coulisse à l'intérieur d'une rainure longitudinale correspondante (21). 10

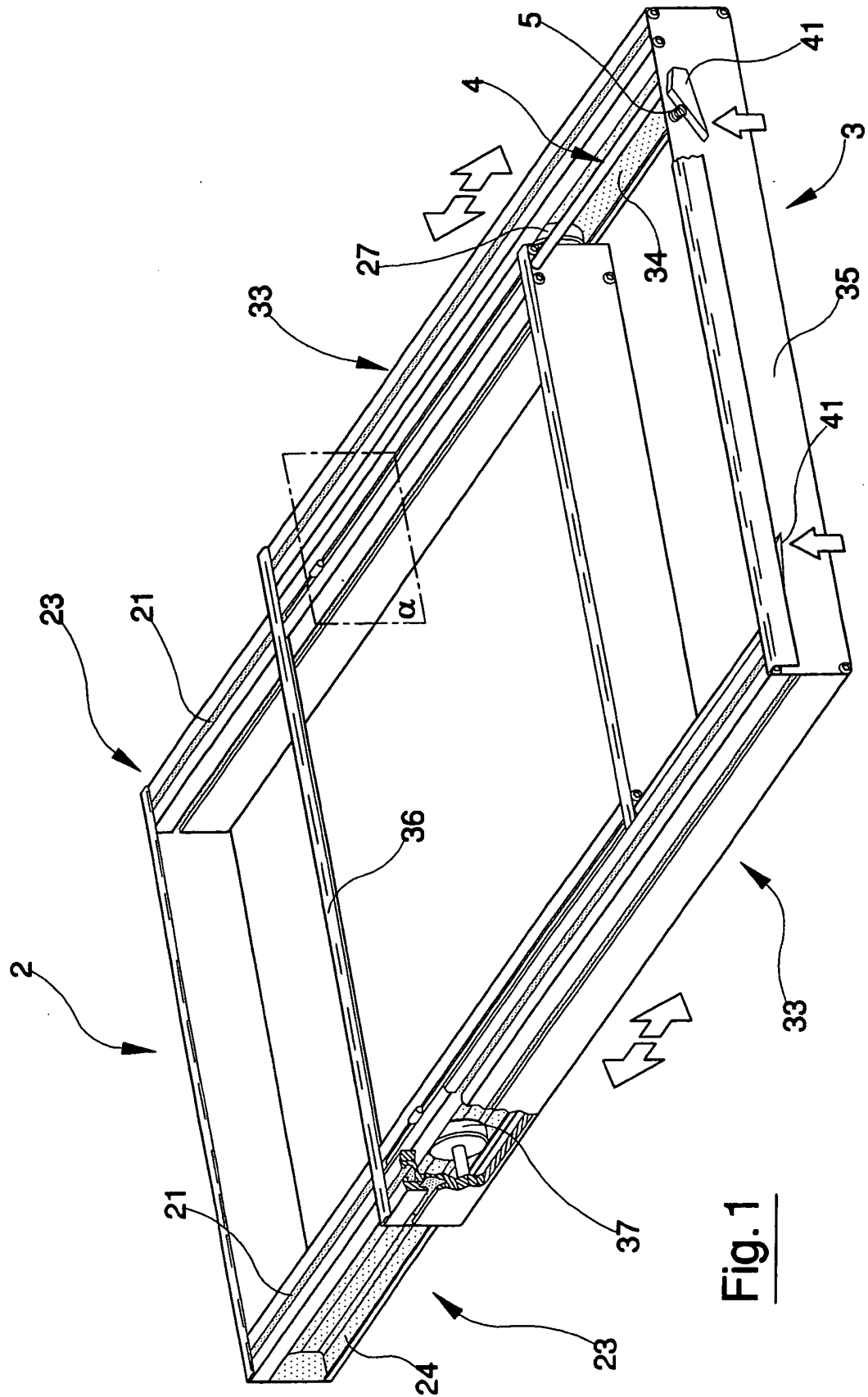


Fig. 1

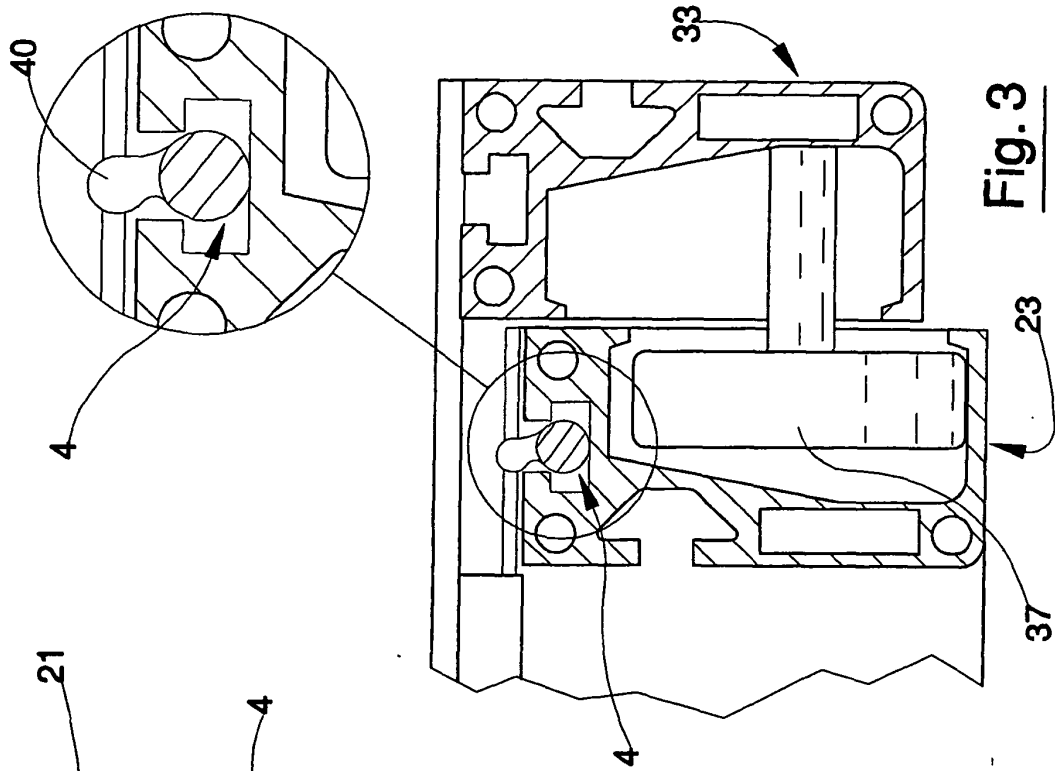


Fig. 3

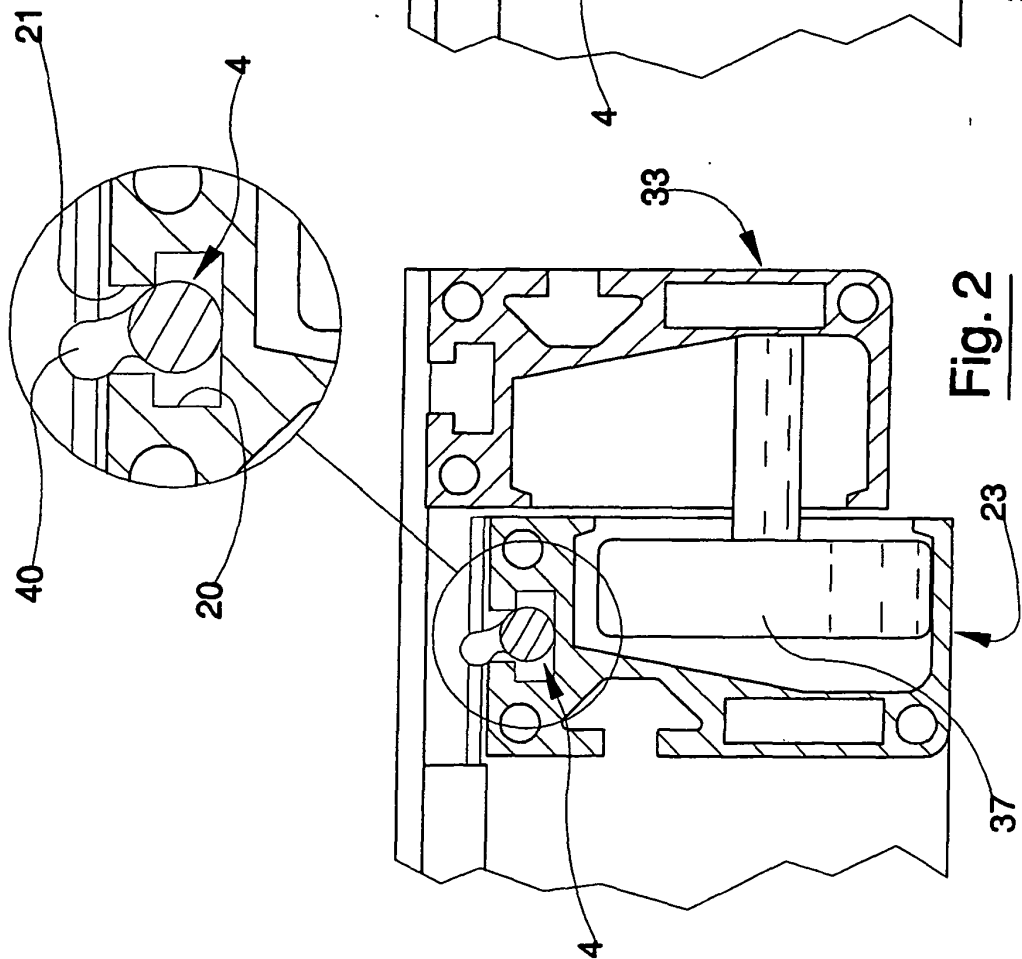


Fig. 2

Fig. 4

