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(54) **Centrally extensible table**

Zentral ausziehbarer Tisch

Table extensible par le centre

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GB-A- 456 885

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EP 2 417 872 B1

Description

Technical Field

[0001] The present invention concerns an extensible table comprising at least a cover plate, at least an extension plate that in the state of table not extended is placed at least partly under the cover plate and in the state of table extended is placed at the same height with the cover plate adjacent to it, and an extension mechanism for passing from the table not extended state to the table extended state and vice-versa, in which the extension mechanism comprises drive members for moving the extension plate relative to said cover plate, and operating members for controlling the movement of said drive members, and in which the drive members comprise at least a horizontal rail and a parallelogram kinematic system.

Background Art

[0002] They are known extensible tables comprising at least a cover plate and at least an extension plate that in the state of table not extended is placed at least partly under the cover plate and in the state of table extended is placed at the same height with the cover plate adjacent to it, and an extension mechanism for passing from the table not extended state to the table extended state and vice-versa.

[0003] This kind of extensible tables is largely used as the extension plate (plates) is blinded under the cover plate (plates) when the table is in the not extended state and it is aligned with the cover plate when it is moved to the extended state.

[0004] In this field it is felt the need of mechanisms for automatically moving from the not extended state to the extended state and vice-versa. In addiction the movement has to be fluid, the mechanism has to be not bulky and blinded as much as possible, and, obviously, at the lowest possible cost.

[0005] In the above outlined category of extensible tables they are known tables in which the extension mechanism comprises drive members for moving the extension plate relative to the cover plate comprising, in addiction to horizontally sliding members, also a parallelogram kinematic system supporting the extension plate and operating members for actuating the movement of the parallelogram kinematic system.

[0006] In addiction, within the above category of tables a further distinguishing can be made between tables in which the cover plate is fixed to the legs and the extension plate previously slides outward and then moves up at the height of the cover plate for extending the length of the table, and those tables in which the cover plates outward slide relative to the legs and the extension plate moves up in the space created by the movement of the cover plates and remains within.

[0007] A table of this last kind is described in DE 3429928 A1 in which the operating members comprise an operating rod connected at one end to a cover plate and cooperating at the other end with operating member integral to the extension plate, in which the end of the rod cooperating with the above operating member is shaped so that it forms two different surfaces cooperating the operating member, one for lifting the extension plate and the other for lowering the extension plate. The above extension mechanism is quite effective, but the kinematic system and structure is quite complex so that it also has quite high production costs.

[0008] In EP 1 371 305 B1 it is described another extensible table of the above type in which the movement from the extended state to the not extended state and vice-versa can be completely or partly automatic. When it is automatic in both directions the operating members comprise operating members for passing to the extended state which are physically separated and different from the operating members for passing to the not extended state. With reference to the drawings of the above cited patent the operating members for moving to the extended state comprise at least a flexible pull cable Z bound at one end to a rail portion S3 integral to a cover plate TP1 and bound at the other end to a point of action AP of a lever H which is part of the parallelogram kinematic system which lifts the extension plate TP3. The mutual movement of the rail portions S1, S2 and S3 leads to a force applied to the point of action AP of the lever H by the cable Z so that the lever H rotates around its pivoting axis SA. The operating members for passing to the not extended state comprise elastic hook shaped driver devices M and M1 integral to a cover plate TP2 and cooperating with the extension plate TP3. The extension mechanism described in EP 1 371 305 B1 is an automatic one but the operating members are not so efficient, mainly the operating members for passing to the not extended state and they also have to be directly bound to the cover plate which could affect the safety of use features of the table.

Summary of invention

[0009] It is an object of the present invention to propose an extensible table with an improved extension mechanism: simple, efficient and with very low production costs.

[0010] According to an aspect of the present invention the above objects are attained by an extensible table comprising at least a cover plate, at least an extension plate that in the state of table not extended is placed at least partially under the cover plate and in the state of table extended is placed at the same height with the cover plate adjacent to it, and an extension mechanism for passing from the table not extended state to the table extended state and vice-versa, in which the extension mechanism comprises drive members for moving said extension plate relative to said cover plate, and operating members for controlling the movement of said drive members, in which said drive members comprise at least a guide comprising at least two guide elements mutually

sliding with a first guide element connected to the extension plate through a lever mechanism comprising levers hinges to the extension plate and to the first guide element in order to compose an articulated parallelogram kinematic system, and a second guide element integral to the cover plate, and wherein the operating members comprise at least a first operating element integral to the second guide element and acting upon one of the levers, and at least a second resilient operating element integral to the second guide element and acting upon the lever.

[0011] Thanks to the above outlined extension mechanism the table of the present invention can be brought from the extended state to the not extended state and vice-versa by simply translating the cover plate. In addiction, the operating members cooperating only with the levers of the parallelogram kinematic system allow very low production costs and great versatility.

[0012] Advantageously the first operating element acts upon the lever at an intermediate region between an upper hinge member and a lower hinge member of the lever and the second operating element acts upon a protrusion of the lever extending from the lower hinge member.

[0013] Still advantageously the second operating member is a leaf spring.

[0014] Preferably the extensible table comprises two cover plates and a transmission assembly for transmitting movement from one cover plate to the other cover plate so that when a cover plate moves to the other cover plate it performs a mirror movement with reference to a center vertical plane of the table.

[0015] Advantageously the transmission assembly comprises two pulleys rotatably bound to opposite longitudinal ends of the first guide element, at least a flexible cable extending between the pulleys for performing a circumferential path, and binding elements for binding a second guide element integral to one cover plate to a lower path of the flexible cable and another second guide element integral to the other cover plate to the upper path of the flexible cable, respectively.

Brief description of drawings

[0016] These and more features of the invention will be more easily comprehensible from the following description of a preferred embodiment of the invention, given as a not limiting example, with reference to the accompanying drawings in which:

- Figure 1 shows two perspective views o fan extensible table according to the present invention: fig. 1 shows the table not extended state, fig. 2 shows the table extended state;
- Figures 2a and 2b show a side view of the table of fig. 1 (without the legs) in the not extended and the extended states respectively;
- Figures 3a to 3d show a side view of components of the table of fig. 1 in various steps of the run from the not extended state to the extended state;
- Figures 4a to 4d show a side view of components of the table of fig. 1 in various steps of the run from the extended state to the not extended state;
- Figure 5 shows a detailed view of some components of the table of fig. 1 during a step of the run from the not extended state to the extended state: fig. 5a is a side view in detail of some components, figs. 5b and 5c show section views obtained by the section line V-V of fig. 5a;
- Figures 6a to 6c are views similar to the views of figs 5a to 5c showing the same components of the table of fig. 1 during steps of the run from the extended state to the not extended state; fig. 6a is a side view, figs. 6b and 6c show section views obtained by the section line VI-VI of fig. 6a.

Description of embodiments

[0017] In figs 1 a and 1 b it is shown an extensible table, 100, according to the present invention, in the not extended and extended states, respectively. The extensible table 100 comprises a cover plate, 10, a further cover plate, 20, and an extension state, 30, that in the not extended state is placed under the cover plates 10 and 20 partially covered by both plates, while in the extended states it is at the same height with the cover plates 10 and 20 adjacent to them.

[0018] In figs. 2a and 2b the extensible table according to the embodiment of fig. 1 is shown in a side view without its legs and the extension members for moving the cover plates and the extension plate are better shown. In fig. 2a the table 100 is in its not extended state with the cover plate 10 adjacent to the other cover plate 20 and the extension plate 30 is placed underneath, covered in part by the cover plate 10 and in part by the cover plate 20. Drive members 40 are mounted below the plates 10, 20 and 30 and they comprise a horizontal guide 41 composed of a first guide element, 41 a and second guide elements , 41 b, 41 c, and a set of levers 45a, 45n, each hinged at two points. The first guide element 41a is a fixed horizontal rail connected to the leg supporting structure (not shown) and the second guide elements 41 b and 41 c are horizontally slide members integral to the first cover plate 10 and the second cover plate 20 respectively. The movement of the second guide element 41 c is depending on the movement of the other second guide element 41 b by a transmission assembly composed of two pulleys 42a, 42b, rotatably bound at opposite longitudinal ends of the first guide element 41 a, a flexible cable, 43, forming a closed loop circumferential path between the pulleys 42a and 42b, and binding element, 44a and 44c for binding the second guide element 41 b to the lower path of the flexible cable 43 and the other second guide element 41 c to the upper path of the flexible cable 43, respectively. Thanks to the above transmission assembly a movement of the second guide element 41 b cause a mirror movement, with reference to the longitudinal symmetry plane S, of the other second guide ele-

ment 41c and then mirror movements with reference to S of the cover plates 10 and 20. Each lever 45a, 45n of the lever mechanism is hinged at its lower end to the first guide element 41 a, at the side opposite to the pulleys 42a, 42b, by first hinge members, 46a, 46n, and it is also hinged at its upper end to the extension plate 30 by second hinge members 47a, 47n, so that the first guide element 41 a, the extension plate 30 and the levers 45a, 45n form together an articulated parallelogram kinematic system which allows the extension plate 30 to perform with respect to the first guide element 41 a a translation movement according to a curve path. In fig. 2b the second guide elements 41 b and 41 c and the cover plates 10 and 20 are shown with broken line in the most outward protruding position they assume in their run from the not extended state to the extended state and vice-versa.

[0019] In figs. 3 to 6 is shown a side view of a portion of the table according to the embodiment of fig. 1 during steps of the run from the not extended state to the extended state and vice-versa emphasizing the way in which operating members, 50, work for controlling the movement of the levers 45a, 45n as a function of the movement of the second guide element 41 b relative to the first guide element 41 a. The operating members 50 are composed of a carriage, 51, mounting a first operating member, 52, integral to it, and a second resilient operating member, 53.

[0020] With reference to figs. 3a to 3d and 5a to 5d will be now described the steps of the run from the not extended state to the extended state.

[0021] In fig. 3a the table is shown in its not extended state. To pass to the extended state the cover plate 10 is moved in the direction shown by arrow F1 of fig. 3b and, thanks to the transmission assembly also the cover plate 20 moves in the direction of arrow F2. The carriage 51 moves integral to the cover plate 10 and the first operating member 52 goes pushing the lever 45a at an intermediate region between its hinge members 46a and 47a, while the second operating member 53 passes below a protrusion, 48, downward extending from hinge member 46a of the lever. In this state thanks to the first operating member 52 the rotation of the hinge 45a and movement of the extension plate 30 start. In fig. 3c the cover plate 10 has moved outward of a further amount and the first operating member 52 has pushed the lever 45a until it lies against an end-of-stroke member, 49, integral to the first guide element 41 a. The end-of-stroke member 49 also defines the most outward protruding position of the cover plate 10. The region where is located the lever 45a in the state of fig. 3c is shown in greater detail in fig. 5a with the broken lines showing the carriage 51 as a transparent element, and the same region is also shown in a horizontal section view in fig. 5b. In addiction, in fig. 5b can be comprehended the shape of the second operating member 53 which is a spring leaf bound to the internal side of the carriage 51. Finally, in fig. 3d the table is shown in the extended state. From the position of fig. 3c to the position of fig. 3d the cover plate 10 is moved in the direction of arrow F3 of fig. 3d and, as a consequence, also the cover plate 20 moves in the direction of arrow F4 of fig. 3d, until the cover plates 10 and 20 are adjacent to the extension plate 30 which is now at a same height with them. During the movement from the position of fig. 3c to the position of fig. 3d the second operating member 53 is bent, as shown in fig. 5c, by the protrusion 48 of the lever 45a, so it passes through the protrusion without operating the lever 45a.

[0022] With reference to figs. 4a to 4d and 6a to 6d will be now described the steps of the run from the extended state to the not extended state.

[0023] In fig. 4a the table is in its extended state. To pass to the not extended state the cover plate 10 is moved in the direction of arrow F1 of fig. 4b and, thanks to the transmission assembly also the cover plate 20 moves in the direction of arrow F2. The region where is located the lever 45a in the state of fig. 4a is shown in greater detail in fig. 6a with the broken lines showing the carriage 51 as a transparent element, and the lever 45a and the extension plate 30 in their position in the not extended state, and the same region is also shown in a horizontal section view in fig. 6b. During the movement from the position of fig. 4a to the position of fig. 4b the carriage 51 moves integral to the cover plate 10 and the second operating member 53 engages the protrusion 48 of the lever 45a. In fig. 4c the second operating member 53, while passing through, rotated the lever causing the extension plate 30 to move to the not extended position. Fig. 6c shows the second operating member 53 in the position of fig. 4b and the second operating member and the lever 45a are shown with broken line in the position of fig. 4c. When the lever 45a has been rotated in the position of fig. 4c the cover plate 10 is stopped moving in the direction of arrow F1 (otherwise the first operating member would rotate again the lever 45a) and the cover 10 plate is moved in the direction of the arrow F3, together with the cover plate 20 which moves in the direction of the arrow F4, until the cover plate 10 and 20 are adjacent each other in the not extended state.

[0024] The above described extensible table has an extension mechanism which allows moving the extension plate from the not extended state to the extended state and vice-versa by simply outward shifting a cover plate and then moving it back inward. The operating mechanism is very simple so that the production costs are low. Furthermore, since the extension plate is moved always acting upon the levers of the mechanism, the drive mechanism can be used with any types of cover plates and extension plates.

[0025] The above features and advantages of the extensible table of the present invention remain unchanged also in different embodiments of the invention.

[0026] A different embodiment of an extensible table according to the invention could have just one cover plate, and the transmission members 42a, 42b, 43, 44a, 44b could be not required in that case.

[0027] The drive members could be different in shape

but still useful to allow the above described movements in which the cover plate 10 perform a horizontal translation and the extension plate 30 a translation according to a curve path.

[0028] The guides and the levers of the drive members could be in a different amount and of a different shape, according to the size and shape of the table.

Claims

1. Extensible table (100) comprising at least a cover plate (10, 20), and at least an extension plate (30) that in the state of table not extended is placed at least partly under the cover plate (10, 20) and in the state of table extended is placed at the same height with the cover plate (10, 20) adjacent to it, and an extension mechanism for passing from the table not extended state to the table extended state and viceversa, in which the extension mechanism comprises drive members (40) for moving said extension plate (30) relative to said cover plate (10, 20), and operating members (50) for controlling the movement of said drive members (40), in which said drive members (40) comprise at least a guide (41) comprising at least two guide elements (41 a, 41 b, 41 c) mutually sliding with a first guide element (41 a) connected to the extension plate (30) through a lever mechanism comprising levers (45a, 45n) hinged to the extension plate (30) and to the first guide element (41 a) in order to compose an articulated parallelogram kinematic system, and a second guide element (41 b, 41 c) integral to the cover plate (10, 20), **characterized in that** said operating members (50) comprise at least a first operating element (52) integral to the second guide element (41b) and acting upon one of said levers (45a), and at least a second resilient operating element (53) integral to the second guide element (41 b) and acting upon said lever (45a).

2. Extensible table (100) according to claim 1 **characterized in that** said first operating element (52) acts upon said lever (45a) at an intermediate region between an upper hinge member (47a) and a lower hinge member (46a) of said lever (45a), and said second operating element (53) acts upon a protrusion (48) of said lever (45a) extending from said lower hinge member (46a).

3. Extensible table (100) according to claim 1 or 2 **characterized in that** said second resilient operating element (53) is a leaf spring.

4. Extensible table (100) according to any preceding claim **characterized in that** it comprises two cover plates (10, 20) and a transmission assembly for transmitting movement from one cover plate (10) to the other cover plate (20) so that when a cover plate (10) moves the other cover plate (20) performs a mirror movement with reference to a center vertical plane (S) of said table (100).

5. Extensible table (100) according to the previous claim **characterized in that** said transmission assembly comprises two pulleys (42a, 42b) rotatably bound to opposite longitudinal ends of the first guide element (41 a), at least a flexible cable (43) extending between said pulleys (42a, 42b) for performing a circumferential path, and binding elements (44a, 44b) for binding a second guide element (41b) integral to one cover plate (10) to a lower path of said flexible cable (43) and the other second guide element (41c) integral to the other cover plate (20) to the upper path of the flexible cable (43), respectively.

Patentansprüche

1. Ausziehtisch (100) mit mindestens einer Deckplatte (10, 20) und einer Vergrößerungsplatte (30) die, Im nicht ausgezogenen Zustand des Tisches, zumindest teilweise unter der Abdeckplatte (10, 20) und, im ausgezogenen Zustand des Tisches, auf gleicher Höhe mit der Abdeckplatte (10, 20) und benachbart dazu angeordnet Ist, und eine Erweiterung Mechanismus zum Wechsel vom nicht ausgezogenen Zustand des Tisches zum ausgezogenen Zustand des Tisches und umgekehrt, wobei die Erweiterung Mechanismus Antriebselemente (40) zum Bewegen der Vergrößerungsplatte (30) relativ zu der genannten Abdeckplatte (10, 20) und Betätigungsmitteln (50) zur Steuerung der Bewegung der Antriebselemente (40) umfaßt, in denen die Antriebselemente (40) wenigstens eine Führung (41) mit mindestens zwei sich gegeneinander gleitenden Führungselementen (41a, 41b, 41c) umfaßt, wobei ein erstes Führungselement (41a) durch einen Hebelmechanismus mit Hebeln (45a, 45n), die an der Vergrößerungsplatte (30) sowie an dem ersten Führungselement (41a) umgelenkt sind, mit der Vergrößerungsplatte (30) verbunden Ist, um eine gelenkige Parallelogramm kinematische System zusammenzusetzen, und ein zweites Führungselement (41b, 41c) einstückig mit der Abdeckplatte (10, 20) vorgesehen ist, **dadurch gekennzeichnet, daß** die Betätigungsmitteln (50) wenigstens ein erstes Betätigungselement (52), der Integral mit dem zweiten Führungselement (41b) ist und auf ein von dem besagten Hebel (45a) einwirkt, und mindestens ein zweites elastisches Betätigungselement (53), der integral mit dem zweiten Pührungselement (41b) ist und auf den Hebel (45a) einwirkt, umfassen.

2. Ausziehtisch (100) nach Anspruch 1, **dadurch gekennzeichnet, daß** das erste Betätigungselement (52) auf den Hebel (45a), in einem mittleren Bereich

zwischen einem oberen Gelenkteil (47a) und einem unteren Gelenkteil (46a) der Hebel (45a), einwirkt, und daß das zweite Betätigungselement (53) auf einen Vorsprung (48) des Hebels (45a), der sich von dem unteren Gelenkteil (46a) erstreckt, einwirkt.

3. Ausziehtisch (100) nach Anspruch 1 oder 2, **dadurch gekennzeichnet, daß** das zweite elastische Betätigungselement (53) eine Blattfeder aufweist.

4. Ausziehtisch (100) nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, daß** zwei Abdeckplatten (10, 20) und einer Getriebeanordnung zur Übertragung der Bewegung von einer Abdeckplatte (10) zu der anderen Abdeckplatte (20) vorgesehen sind, so daß, wenn eine Abdeckplatte (10) bewegt wird, bewegt sich die andere Deckplatte (20) mit einer Spiegel Bewegung anhand einer vertikalen Mittelebene (S) des Tisches (100).

5. Auszlehtisch (100) nach dem vorigen Anspruch, **dadurch gekennzeichnet, daß** die Getriebeanordnung zwei Riemenscheiben (42a, 42b) aufweist, die drehbar an entgegengesetzten Längsenden des ersten Führungselement (41a) gebunden sind, mit mindestens einem zwischen der Riemenschelben (42a, 42b) sich erstreckenden flexiblen Kabel (43) zum Durchführen einer Umlaufbahn, und mit Bindungselemente (44a, 44b) zum Binden eines zweiten Führungselement (41b), das integral mit einer Abdeckplatte (10) vorgesehen ist, an einem unteren Weg des flexiblen Kabels (43), und des anderen zweiten Führungselements (41c), das integral mit der anderen Abdeckplatte (20) vorgesehen ist, mit dem oberen Weg des flexiblen Kabels (43).

Revendications

1. Table extensible (100) comprenant au moins un plateau de couverture (10, 20), et au moins une rallonge (30) que est située au moins partiellement sous le plateau de couverture (10, 20), dans l'état pas étendu de la table, et que est située à la même hauteur avec le plateau de couverture (10, 20) qui lui est adjacente, dans l'état étendu de la table, et un mécanisme d'extension pour le passage de l'état pas étendu de la table à l'état étendu de la table et viceversa, où le mécanisme d'extension comprend des éléments d'entraînement (40) pour déplacer ladite rallonge (30) par rapport audit plateau de couverture (10, 20), organes d'actionnement (50) pour commander le déplacement desdits éléments d'entraînement (40), lesdits éléments d'entraînement (40), comprenant au moins un guide (41) qui comprend au moins deux éléments de guidage (41a, 41b, 41c) coulissant mutuellement, avec un premier élément de guidage (41a) reliée à la rallonge (30) à travers un mécanisme à levier comprenant des leviers (45a, 45n) articulé sur la rallonge (30) et au premier élément de guidage (41a) afin de composer un système cinématique à parallélogramme articulé, et un deuxième élément de guidage (41b, 41c) solidaire au plateau de recouvrement (10, 20), **caractérisé en ce que** lesdits organes d'actionnement (50) comprennent au moins un premier élément d'actionnement (52) solidaire avec le deuxième élément de guidage (41b) et agissant sur l'un desdits leviers (45a), et au moins un deuxième élément d'actionnement (53) élastique solidaire avec le deuxième élément de guidage (41 b) et agissant sur ledit levier (45a).

2. Table extensible (100) selon la revendication 1, **caractérisé en ce que** ledit premier élément d'actionnement (52) agit sur ledit levier (45a) dans une région intermédiaire entre un élément charnière supérieur (47a) et un élément de charnière Inférieure (46a) dudit levier (45a), et ledit deuxième élément d'actionnement (53) agit sur une saillie (48) dudit levier (45a) s'étendant à partir dudit élément charnière inférieur (46a).

3. Table extensible (100) selon la revendication 1 ou 2, **caractérisé en ce que** ledit deuxième élément d'actionnement (53) élastique est un ressort à lame.

4. Table extensible (100) selon l'une quelconque des revendications précédentes, **caractérisé en ce qu'**il comprend deux plateaux de recouvrement (10, 20) et un ensemble de transmission pour transmettre le mouvement d'un plateau de couverture (10) à l'autre plateau de recouvrement (20) de sorte que quand un plateau de recouvrement (10) se déplace l'autre plateau de recouvrement (20) effectue un mouvement en miroir par rapport à un plan vertical central (S) de ladite table (100).

5. Table extensible (100) selon la revendication précédente **caractérisé en ce que** ledit ensemble de transmission comprend deux poulies (42a, 42b) liés en rotation à des extrémités longitudinales opposées du premier élément de guidage (41a), au moins un câble flexible (43) s'étendant entre lesdites poulies (42a, 42b) pour effectuer un trajet circonférentiel, et des éléments de liaison (44a, 44b) pour la liaison d'un deuxième élément de guidage (41b) solidaire avec un plateau de couverture (10) à une vole inférieure dudit câble flexible (43) et l'autre deuxième élément de guidage (41c) solidaire avec l'autre plateau de recouvrement (20) à la trajectoire supérieure du câble flexible (43), respectivement.

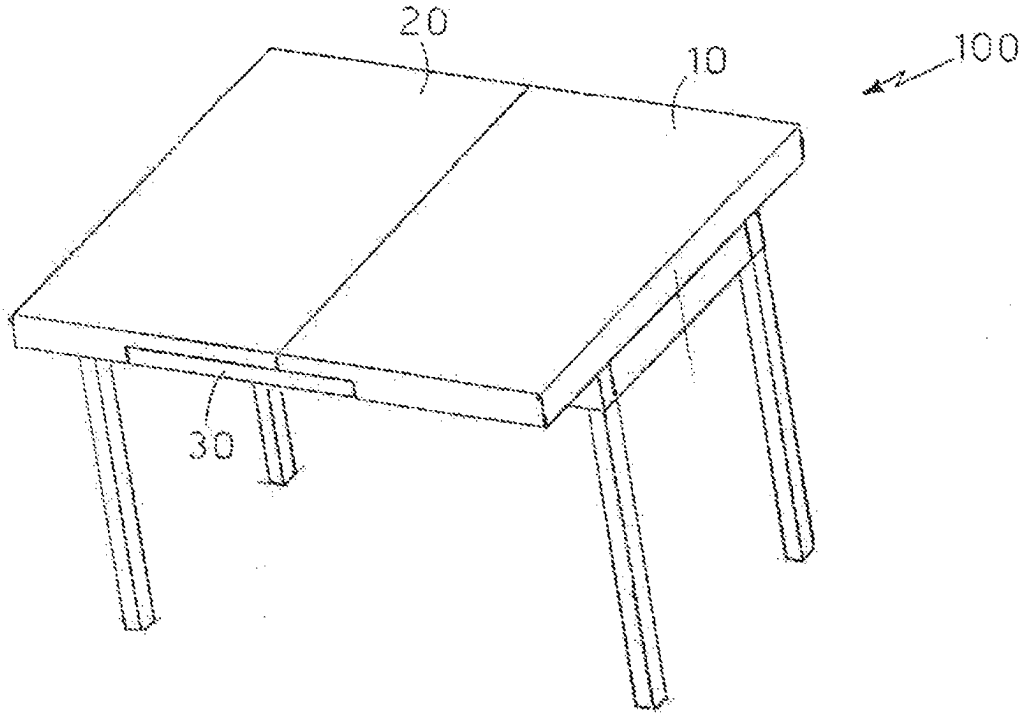


FIG.1a

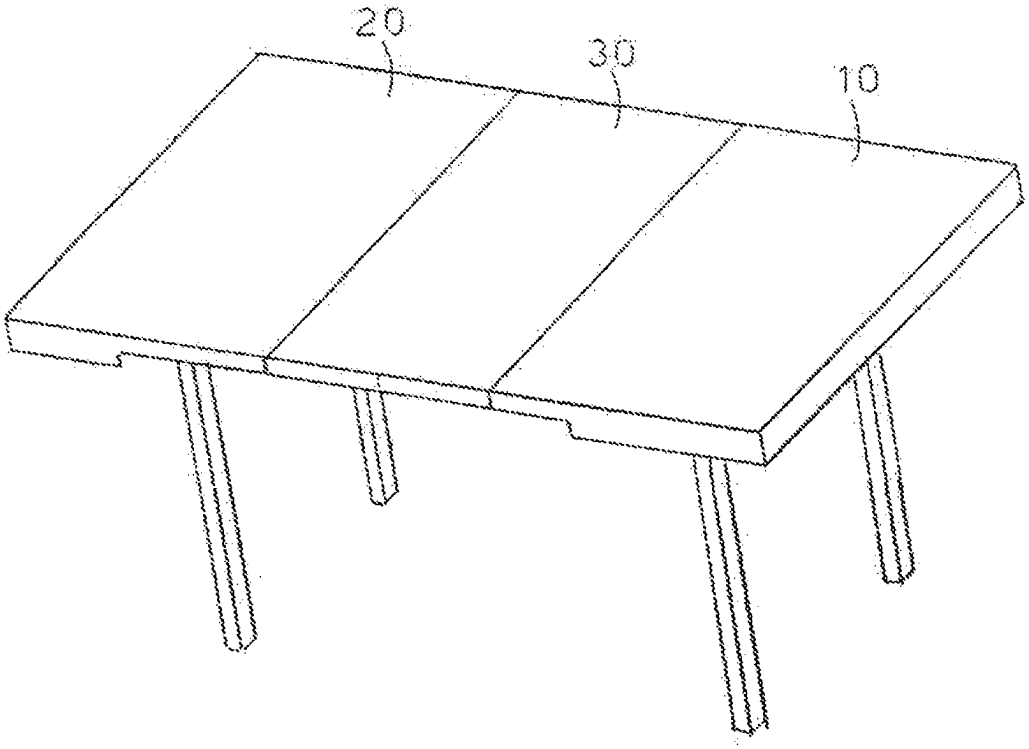


FIG.1b

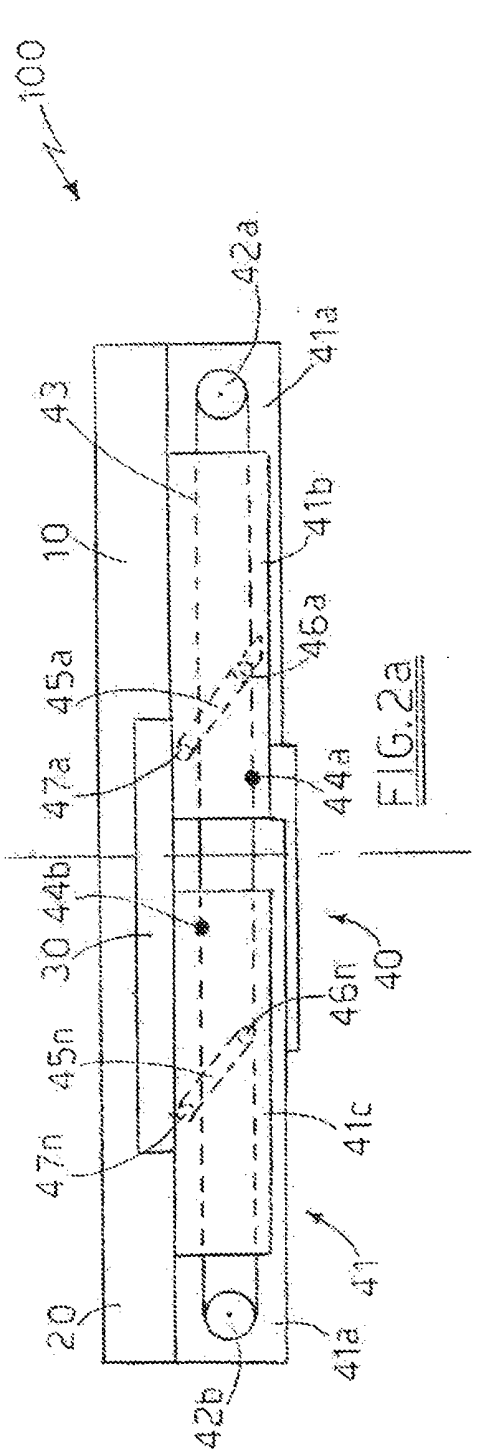

100
42a
41a
43
10
41b
45a
46a
47a
44a
44b
30
46n
40
45n
41c
47n
41
20
41a
42b

FIG.2a

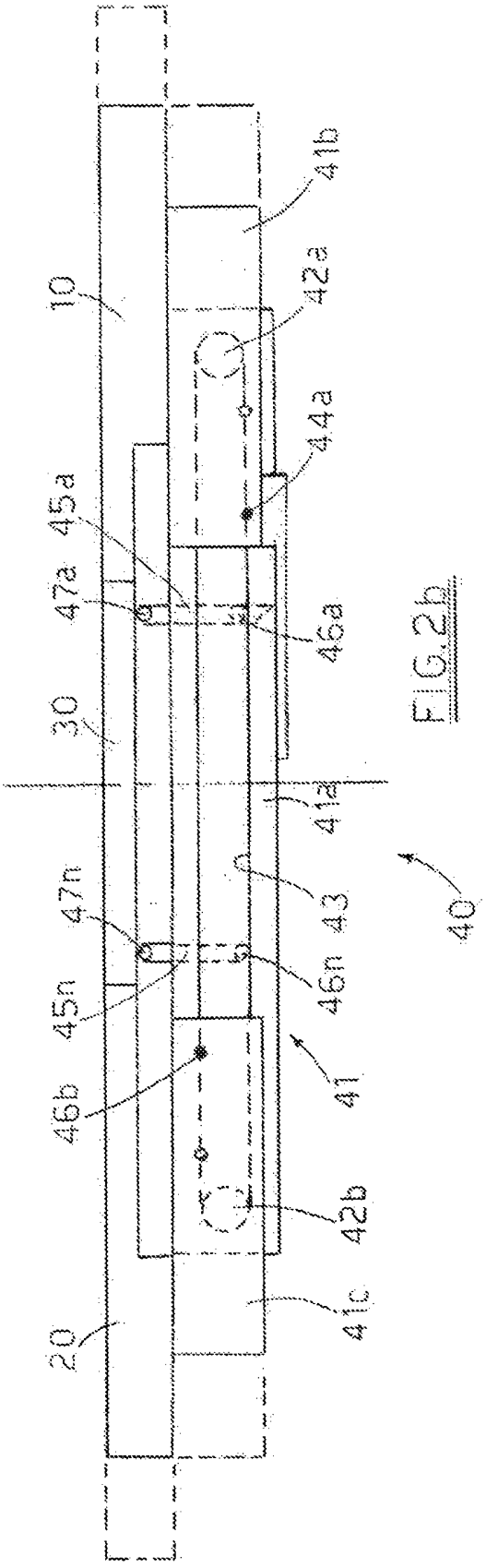

41b
10
42a
44a
45a
47a
46a
30
41a
47n
43
40
45n
46n
46b
41
42b
20
41c

FIG.2b

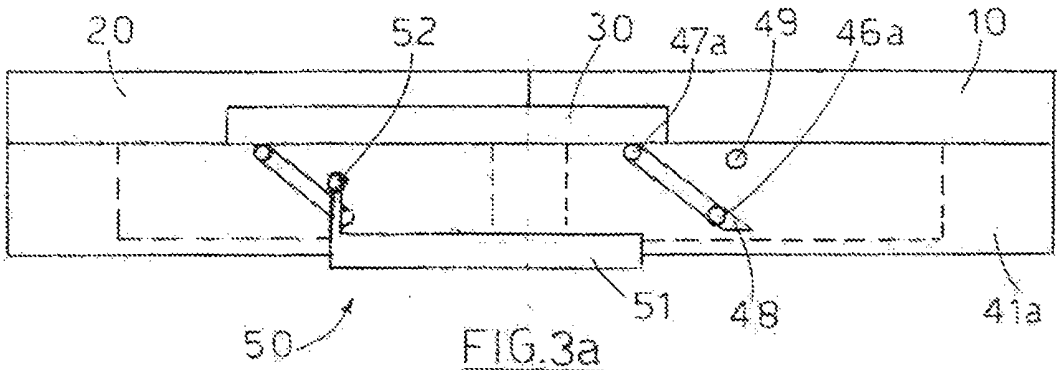


FIG.3a

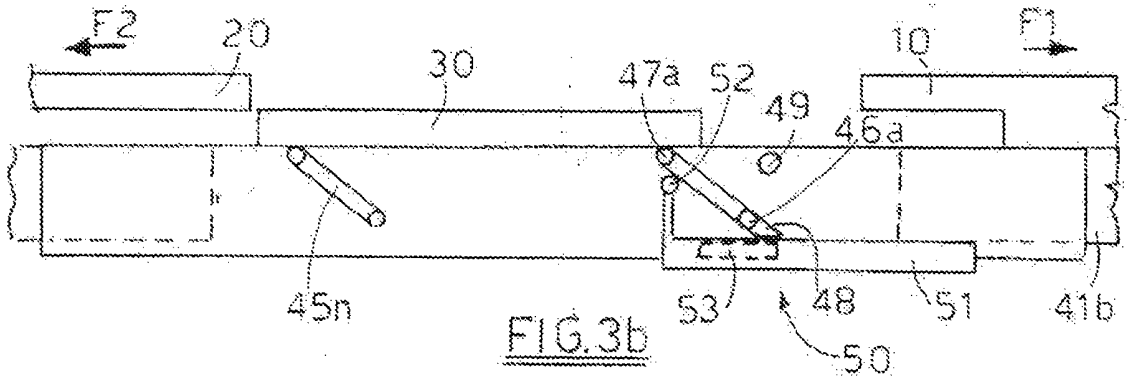


FIG.3b

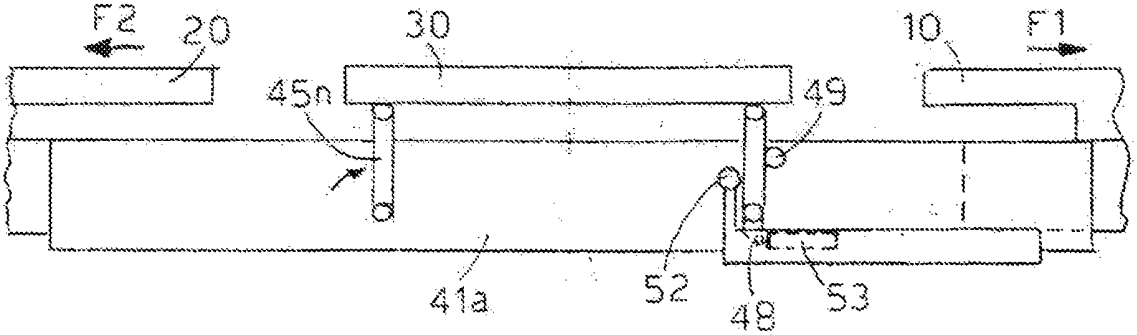


FIG.3c

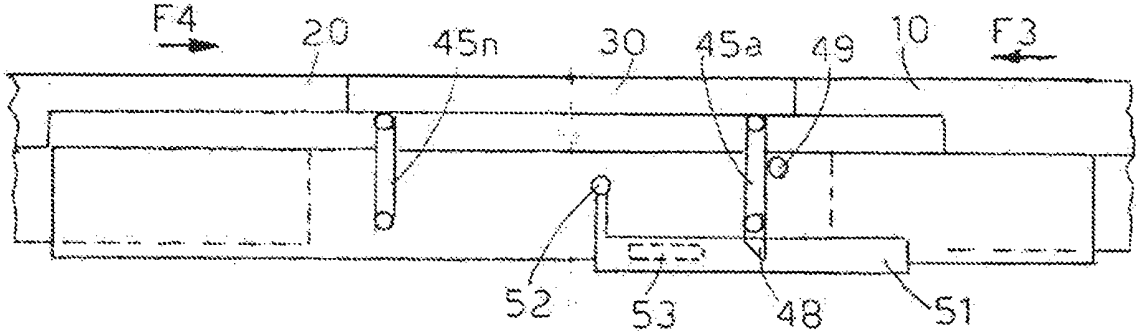


FIG.3d

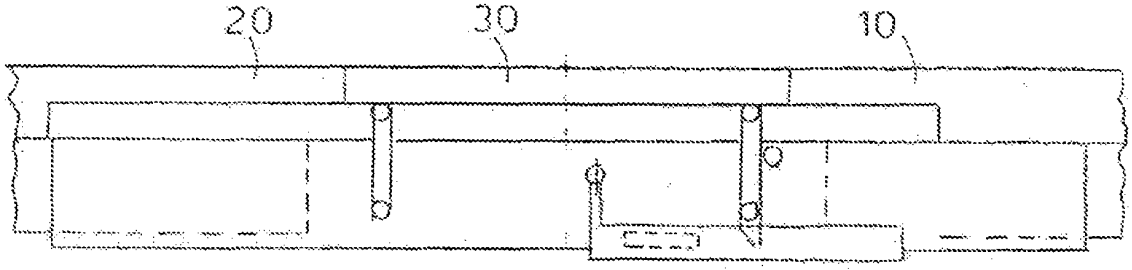


FIG.4a

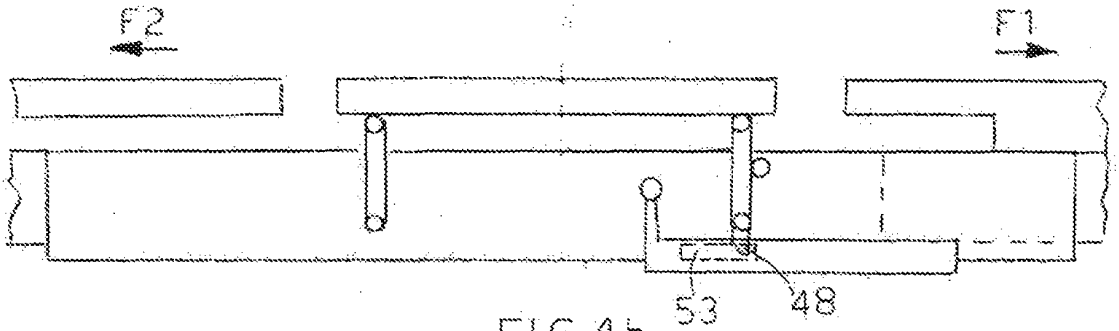


FIG.4b

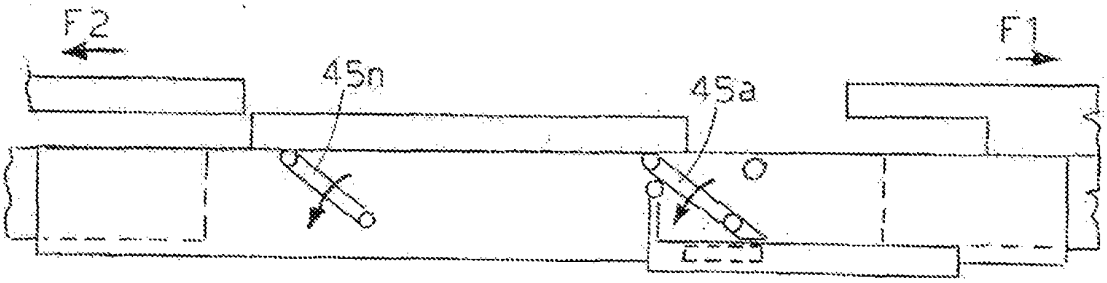


FIG.4c

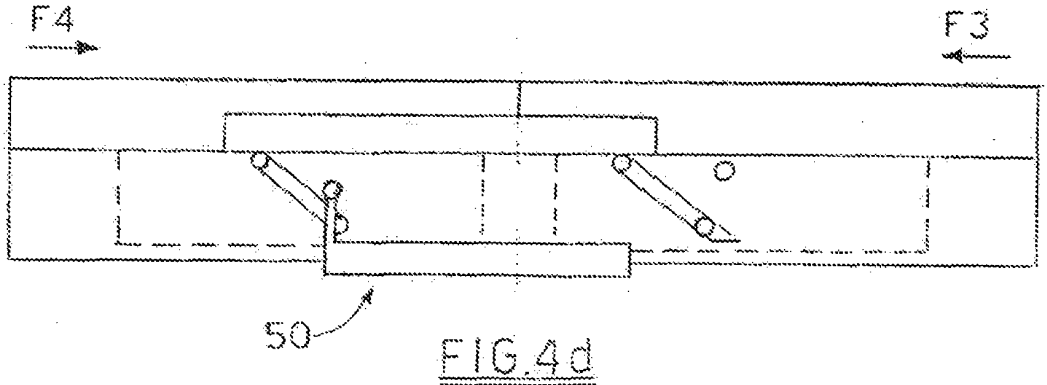


FIG.4d

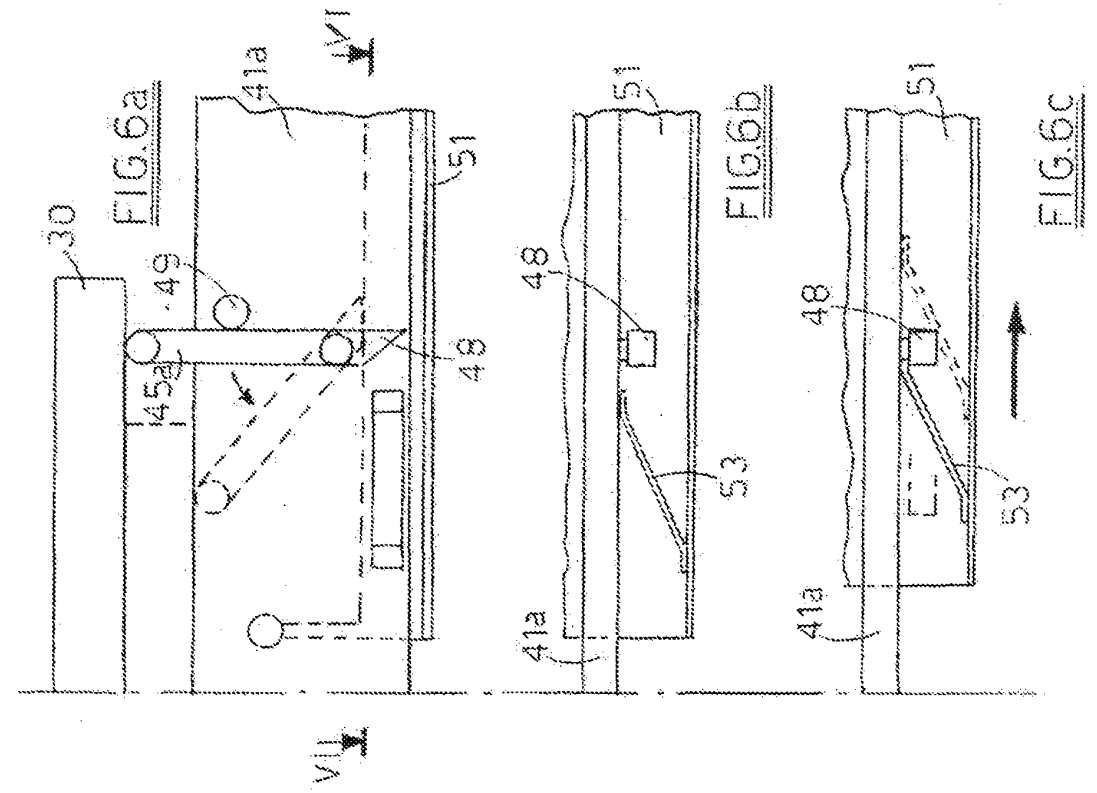


FIG.6a FIG.6b FIG.6c

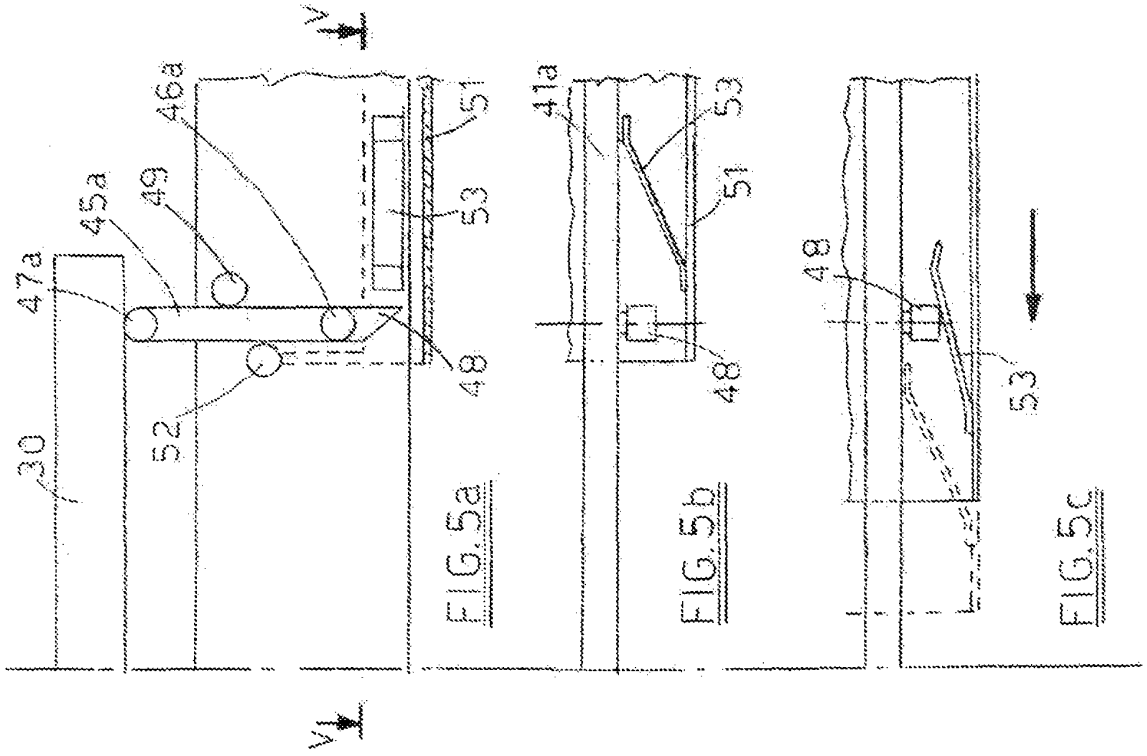


FIG.5a FIG.5b FIG.5c

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- DE 3429928 A1 **[0007]**
- EP 1371305 B1 **[0008]**