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(54) **A STRUCTURE FOR SUPPORTING SEWING MACHINES**

(57) A structure for supporting sewing machines of articles, comprising: at least two components, a first component (2) and a second component (3), parallel to one another, defining the base of the structure; at least two opposite uprights (4, 5), each constrained inferiorly to a corresponding one of the components, upper heads (4A, 5A) of which are horizontal, and coplanar to one another, so as to define a plane (Z) for restingly receiving a sewing machine (M); at least a first cross-member (6) connecting the uprights; at least a second cross-member (7) connecting the components: a first and a second pair of

wheels (12A-12B, 22A-22B), with the relative axes thereof being parallel to one another, borne by relative first and second means (10, 20) correspondingly supported by said first component (2) and second component; activating means for synchronously moving the pairs of wheels from a non-operating position (K), wherein the pairs of wheels are raised with respect to the support plane (P) abutted by said components (2, 3), to an operating position (H) wherein they intercept said support plane (P) with consequent raising with respect to the support plane (P) of the structure.

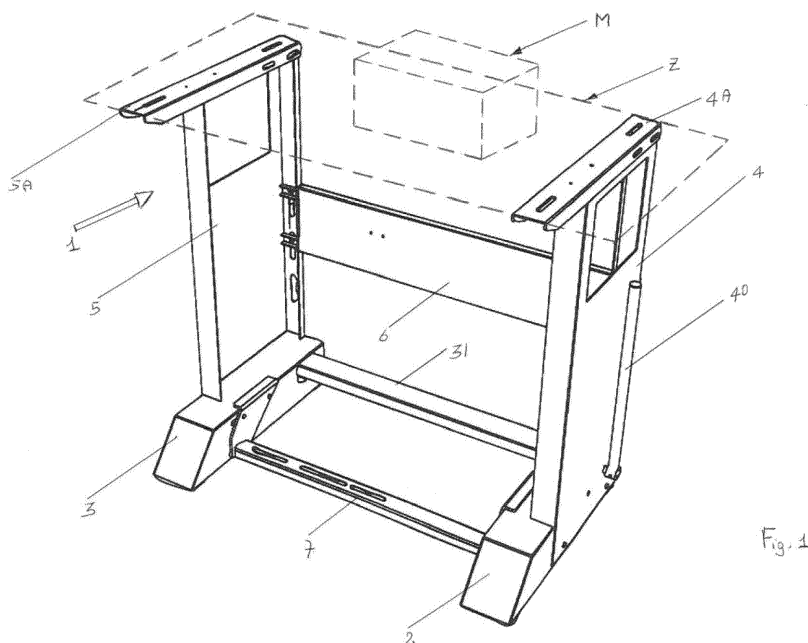


Fig. 1

Description

[0001] It is known that sewing machines of articles, for example: shoes, machines for carrying out special work operations on leather, fabrics, various articles etc., require a suitable structure on which the above materials are arranged resting.

[0002] This structure does not only carry out a mere support and positioning function of the machine with respect to the operator, but must be such as to enable displacement thereof into predetermined work areas or in predetermined stations of an assembly line.

[0003] The problem therefore arises of displacing the machine, or the structure-machine assembly, in a simple and rapid way, without risks for the operators and without the machine falling from the structure.

[0004] If the base of the structure is without wheels, it is necessary to provide suitable means, for example fork-lift trucks, which lift and transport the structure so as to locate it on the floor in the preselected areas.

[0005] If the base of the structure comprises wheels, the displacements of the structure are, as known, rapid and easy.

[0006] This latter solution involves a number of drawbacks, for example: technical specifications are required to stabilise the structure to avoid undesired displacements thereof; further, the presence of the wheels increases the height of the plane restingly bearing the machine, and the operator must take account of these; in the area affecting the wheels, i.e. the area between the floor and the base of the structure, dirt collects with the negative aspects associated to and/or caused by the dirt.

[0007] It is known that the wheels are constituted by elastic material, e.g. rubber; it follows that during the use of the machine the structure vibrates, and with it the machine, with all the drawbacks that this entails. Lastly, the presence of the wheels certainly does not have a positive effect on the aesthetic appearance of the structure and, consequently, of the structure-machine assembly.

[0008] The invention has the aim of providing a suitable structure for supporting machines, for example sewing machines of articles, conformed in such a way as to obviate the drawbacks of the prior art, in particular being displaceable easily and rapidly, without this requiring the use of operating means and/or intervention of specialised personnel, and which is stable when positioned in the desired area.

[0009] A further aim of the invention has the aim of providing a structure that, as well as satisfying the preceding advantage, is functional and reliable, and involves little, and even no, maintenance.

[0010] A still further aim of the invention consists in providing a structure having a pleasing aesthetic appearance.

[0011] The above-mentioned advantages are obtained according to the contents of the claims.

[0012] As a connecting rod of the first means and a connecting rod of the second means is advantageously

splined to the transversal shaft to which, in turn an end of the command arm is splined, by using only the movement of the command arm it is possible to determine the operating position and non-operating position of the first and second pair of wheels.

[0013] In other words, with the purpose of passing from the operating position and the non-operating position, and vice versa, it is sufficient to rotate the command arm, to the first component and the second component, respectively in a direction or in the opposite direction. The lowering and raising of the bars, which bear the pairs of wheels, is determined by the movement only of the command arm and this makes the structure simple to realise and to utilise, during the relative movement.

[0014] Further characteristics of the invention will emerge from the following description, with reference to the appended tables of figures in which:

- figure 1 is a perspective view of the structure of the invention;
- figure 2 is a further perspective view of the structure with some parts removed and others in exploded view, with the purpose of highlighting the technical-functional aspects of the technical solution of the structure;
- figure 3 is a lateral schematic view of the structure of the invention with the wheels thereof in a non-operating position;
- figure 4 is a lateral schematic view of the structure of the invention with the wheels thereof in an operating position.

[0015] With reference to figure 1, reference numeral 1 denotes a structure for supporting sewing machines of articles.

[0016] The structure comprises two box-shaped components (2, 3), a first and a second, which are parallel to one another and define the base of the structure; two opposite uprights (4, 5), each constrained inferiorly (in a known way) to a corresponding component (2, 3), upper heads (4A, 5A) of which are horizontal, and coplanar to one another, so as to define a plane (Z) for restingly receiving a sewing machine (M); a first cross-member (6) the ends of which are fixed, in known ways, to the uprights; a second cross-member 7 connecting, in a known way, the above-mentioned box-shaped components (2, 3).

[0017] With reference to figures 2-4, reference numeral 10 denotes a first bar linkage (inside the first component (2)) comprising a bar (11), which supports two wheels (12A, 12B) with interpositioning of springs (13): the ends of two pairs of connecting rods (14A, 14B) are hinged to the bar and the remaining ends are hinged to relative plates (15A, 15B) which are fixed to the upper part (2A) of the first component (2).

[0018] Figure 3 shows that the first component 2 inferiorly comprises an extension opening (2C) such as to enable the wheels (12A, 12B) to partially exit therefrom.

[0019] In the same way, the second component (3) inferiorly comprises an extension opening (not illustrated) so as to enable the wheels (22A, 22B) to partially exit therefrom.

[0020] Internally of the second box-shaped component (3) (conformed alike the first box-shaped component (2)), a second bar linkage (20) is included, identical to the first bar linkage (10), comprising a bar (21) (to which two wheels (22A, 22B)) are fixed, to which two pairs of connecting rods (24A, 24B), in turn hinged to plates (25) which are fixed to the upper part 3A of the second box-shaped component (3); this is also inferiorly open to enable the wheels (22A, 22B) to partially exit therefrom.

[0021] Figure 2 clearly illustrates that the axes of the wheels (12A, 12B, 22A, 22B) are parallel to one another, or perpendicular to the components (2, 3), and are co-axial, two-by-two.

[0022] The described structure comprises a shaft (30), rotatably supported, in a known way to the expert in the sector, by the above-mentioned box-shaped components (2, 3); the shaft is rotationally coupled with a first pair of connecting rods (14A) of the first bar linkage (10), and with a first pair of connecting rods (24A) of the second bar linkage (20).

[0023] The shaft (30) is partly enveloped by a casing (31) (figures 1, 2) constrained to said components (2, 3).

[0024] A command arm (40), external to the first upright (4), is splined to the shaft (30).

[0025] The oscillation of the arm in direction S1 causes a lowering (direction A) of the bars (11, 21) of the bar linkages (10, 20) with respect to the components (2, 3); vice versa, the oscillation of the arm (40) in direction S2, opposite the previous direction S1, causes a raising (direction I) of the bars (11, 21) with respect to the components (2, 3).

[0026] With the command arm in vertical position (figure 3), the bar linkages (10, 20) stabilise the pairs of wheels (12A-12B, 22A-22B) in the non-operating position (K), in which the wheels are raised with respect to the floor (P) (figure 3).

[0027] In this non-operating position (K) the structure (1), by means of the relative box-shaped components (2, 3) is stably resting on the floor (P); in this condition the operator intervenes to activate the machine (M) (schematically indicated) resting on the plane (Z).

[0028] To move the structure (1), or the structure (1) - machine (M) assembly, into a different area from the one in which it was previously operating, it is sufficient to oscillate the command arm in direction (S1) (figure 2): this leads to the synchronous displacement of the bars (11, 21) of the bar linkages (10, 20) in direction A (figure 2) which leads to the synchronous raising of the components (2, 3) with a consequent partial exit of the pairs of wheels (12A-12B, 22A-22B) from the relative openings located inferiorly in the components (2, 3) (in the accompanying figures 3, 4 only the opening (2C) of the component (2) is illustrated).

[0029] In this way an operating position (H) of the pairs

of wheels (12A-12B, 22A-22B) is defined (figure 4) in which the wheels about the floor (P) and, consequently, support the structure (1).

[0030] In this way the structure (1), or the structure (1) - machine (M) assembly can be moved into the desired area, exploiting the rolling of the wheels on the floor.

[0031] Once the area has been reached, the operator intervenes on the command arm (40) in such a way as to oscillate it in direction S2; this causes, by means of the bar linkages (10, 20), the synchronous movement in an upwards direction (arrow I) of the bars (11, 21) with a consequent return of the pairs of wheels (12A-12B, 22A-22B) internally of the relative box-shaped components (2, 3).

[0032] In this way the configuration of figure 3 is re-established, in which the structure (1) is supported by the relative box-shaped components (2, 3). By operating position H is meant a position in which the pairs of wheels intercept said support plane (P) with consequent raising of the structure with respect to the support plane (P). In other words, the pairs of wheels are in contact with the support plane (P).

[0033] To sum up, for the displacement of the structure pairs of wheels are used; when the displacement has been completed, the wheels are retracted into the relative components (2, 3).

[0034] The above-described situations are defined by operating on only the command arm (40) which is easy and rapid and can be actuated by non-expert personnel.

[0035] It is stressed that the structure (1), or the structure (1) - machine (M) assembly, is supported by the wheels only at the time of transfer from one operating station to another; in these stations the structure (1), or the structure (1) - machine (M) assembly, is supported by the box-shaped components (2, 3) so that it is stable, with all the advantages that brings.

[0036] Further, the operator intervening on the machine (M) works at a height determined as a function of the height of the structure.

[0037] The structure (1), once positioned, is supported by the box-shaped components that stabilise the structure; it follows that on using the machine (M) vibrations are not generated in the structure-machine assembly with all the advantages that brings.

[0038] The bar linkages (10, 20), with relative pairs of wheels, are located internally of the box-shaped components (2, 3); the accumulation of dust and foreign bodies is therefore insignificant on both the bar linkages and wheels, and inside the components themselves.

[0039] These pairs of wheels, and the relative bar linkages, as they are contained by the box-shaped components, do not alter the aesthetic appearance of the structure.

[0040] The oscillation in direction S1 of the command arm (40) can determine the movement of the at least two connecting rods (14, 24) in the same direction S1 so that the at least two connecting rods (14, 24) determine the lowering (A) of the bars (11, 21) with respect to the com-

ponents (2, 3). The oscillation in direction S2 of the command arm (40) can determine the movement of the at least two connecting rods (14, 24) in the same direction S2 so that the at least two connecting rods (14, 24) determine the raising (I) of the bars (11, 21) with respect to the components (2, 3).

[0041] The structure can comprise a pair of plates (25), each having a first end connected to the upper part, respectively, of the first component (2) and the second component (3) and a second end connected to one of the at least two connecting rods (14, 24). The at least two connecting rods (14, 24) are hinged to the pair of plates (25).

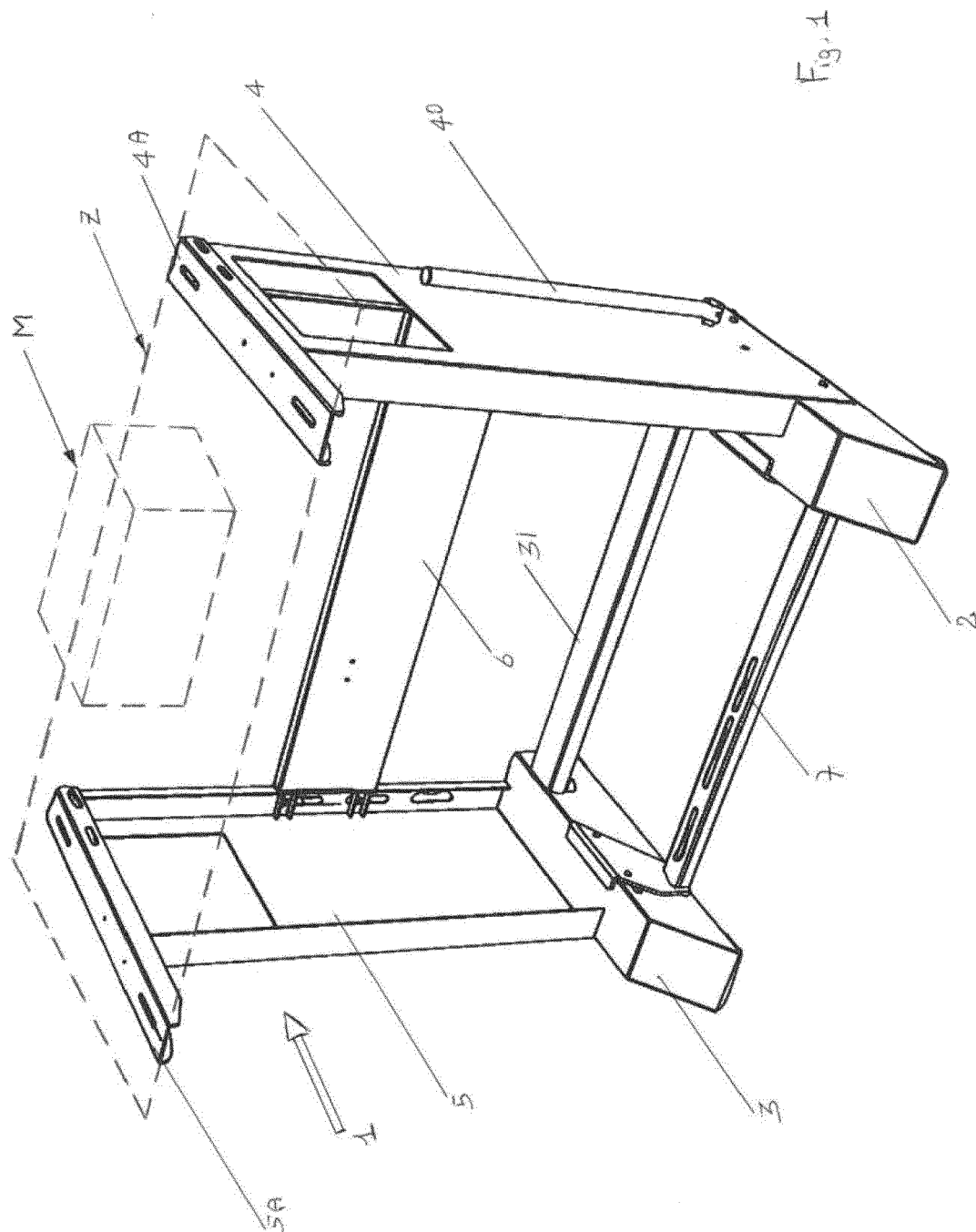
[0042] It is understood that the above has been described by way of example and that technical-functional variants are considered to fall within the protective scope of the invention as claimed in the following.

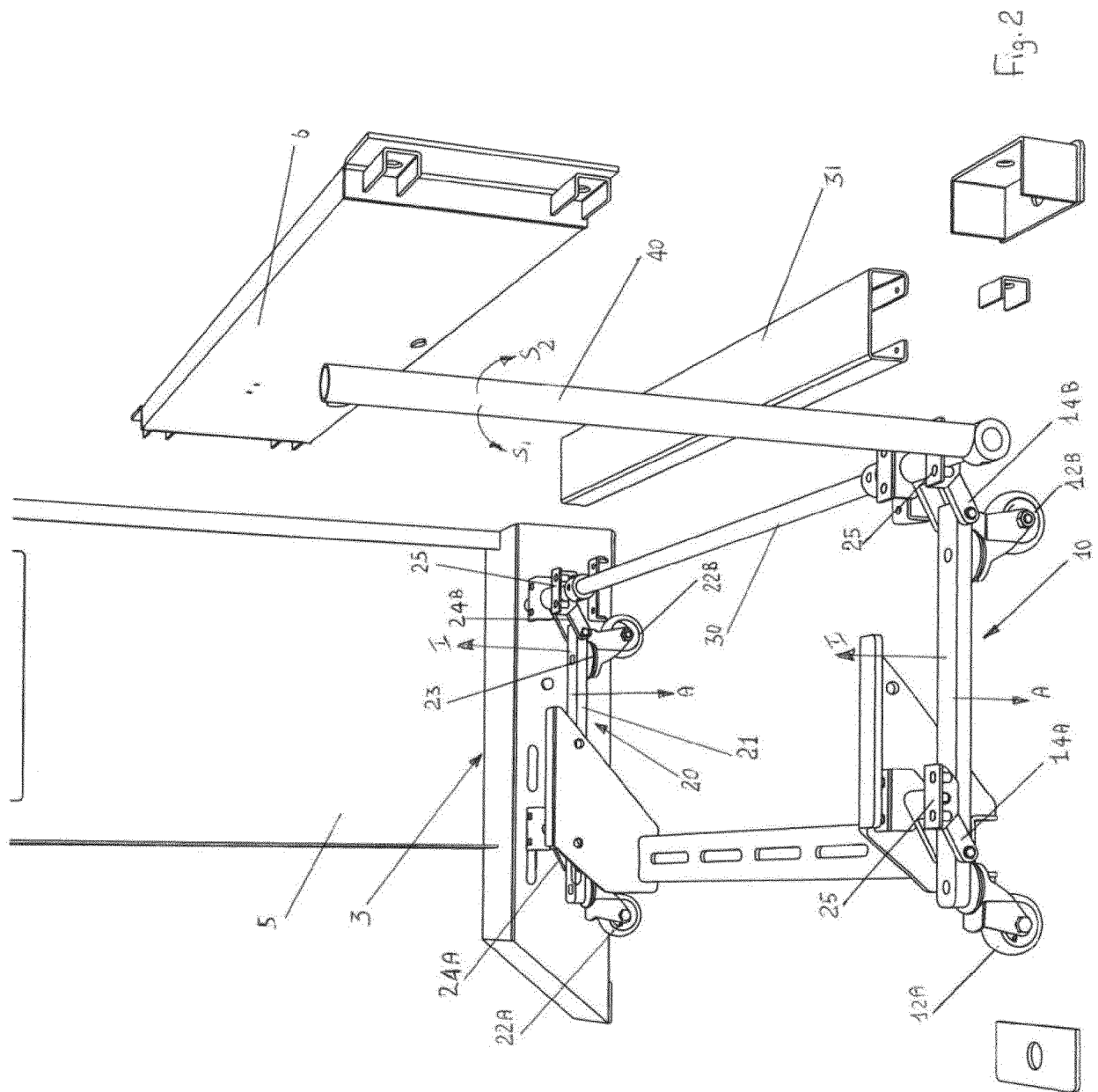
Claims

1. A structure for supporting sewing machines, comprising: at least two components, a first component (2) and a second component (3), parallel to one another, defining the base of said structure; at least two opposite uprights (4, 5), each connected at the relative lower side to a corresponding one of said components, upper heads (4A, 5A) of which are horizontal, and coplanar to one another, so as to define a plane (Z) for restingly receiving a sewing machine (M); at least a first cross-member (6) connecting said uprights; at least a second cross-member (7) connecting said components; a first and a second pair of wheels (12A-12B, 22A-22B), with the relative axes thereof being parallel to one another, borne by relative first and second means (10, 20) correspondingly supported by said first component (2) and second component; activating means for synchronously moving the pairs of wheels from a non-operating position (K), wherein the pairs of wheels are raised with respect to a support plane (P) abutted by said components (2, 3), to an operating position (H) wherein they intercept said support plane (P) with consequent raising with respect to the support plane (P) of said structure; wherein said first and second means comprise corresponding bar linkages (10, 20) each comprising a bar (11, 21) which bears the relative pair of wheels, and at least two connecting rods (14, 24) hinged by one side to said bar (11, 21) and by another side to the relative component (2, 3) of said components, with a connecting rod (14) of said first means and a connecting rod (24) of said second means activated in synchrony by said activating means; **characterised in that** said activating means comprise: a transversal shaft (30) on which a connecting rod (14) of said first means and a connecting rod (24) of said second means are splined; a command arm (40) of which an end is splined to said shaft, the os-

cillation of which in one direction (S1) and in the other direction (S2) respectively determines a lowering (A) and a raising (I) of said bars (11, 21) which respectively bear the first and the second pair of wheels, to respectively define the operating position (H) and the non-operating position (K).

2. The structure of claim 1, **characterised in that** said command arm is external with respect to a relative upright (4) of said uprights (4, 5).
3. The structure of any one of the preceding claims, **characterised in that** said first and second components have a box shape and comprise a lower opening (2C) for correspondingly containing said first and second means, the lower opening of each box shape being included to enable partial exiting of the relative pair of wheels through the lower opening.
4. The structure of claims 1, 2 and 3, **characterised in that** elastic means (13, 23) are interposed between each wheel and the corresponding bar (11, 21).
5. The structure of claims 1 or 2, **characterised in that** said shaft (30) is partly enveloped by a casing (31) constrained to said components (2, 3).
6. The structure of any one of the preceding claims, wherein: the oscillation in direction (S1) of the command arm (40) determines the movement of the at least two connecting rods (14, 24) in the same direction (S1) so that the at least two connecting rods (14, 24) determine the lowering (A) of the bars (11, 21) with respect to the components (2, 3); the oscillation in direction (S2) of the command arm (40) determines the movement of the at least two connecting rods (14, 24) in the same direction (S2) so that the at least two connecting rods (14, 24) determine the raising (I) of the bars (11, 21) with respect to the components (2, 3).
7. The structure of any one of the preceding claims, wherein: it comprises a pair of plates (25), each having a first end connected to the upper part, respectively, of the first component (2) and the second component (3) and a second end connected to one of the at least two connecting rods (14, 24); the at least two connecting rods (14, 24) are hinged to the pair of plates (25).





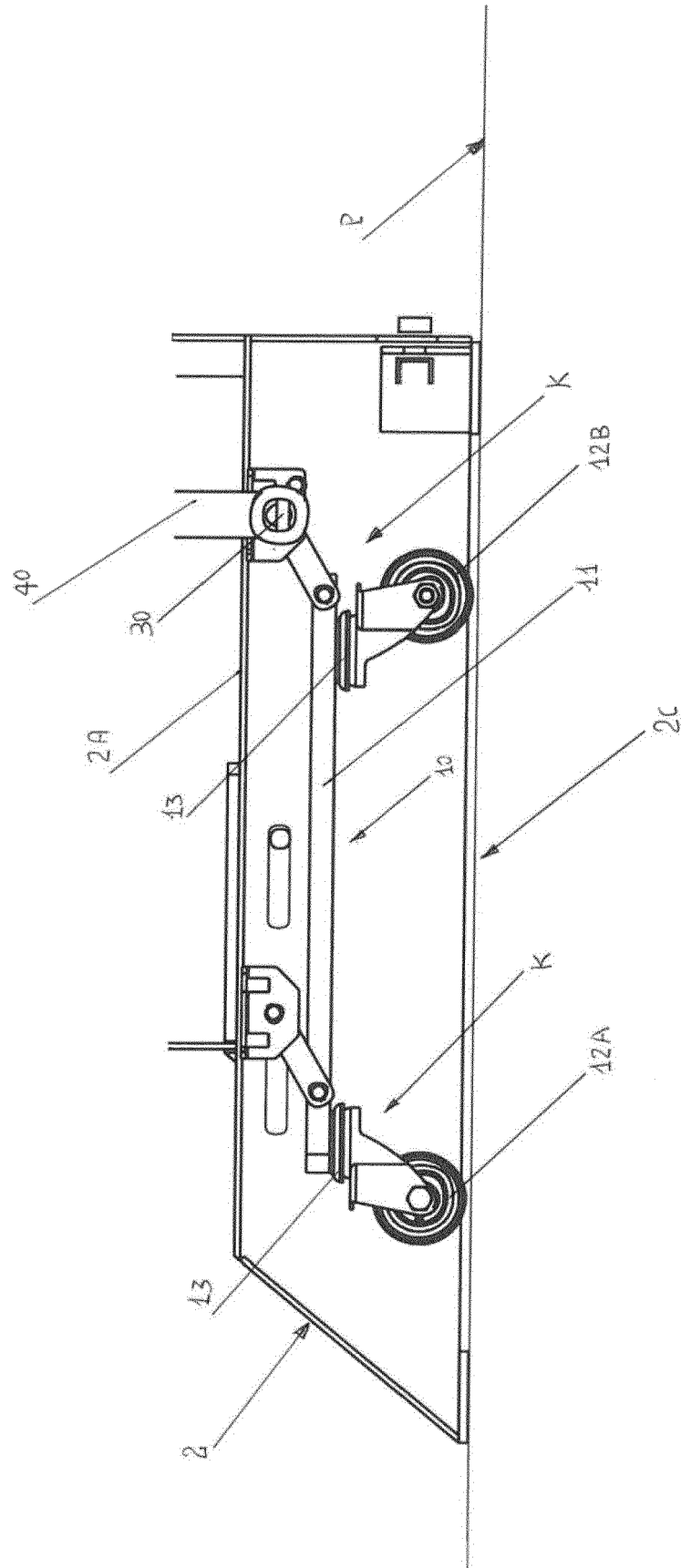


Fig. 3

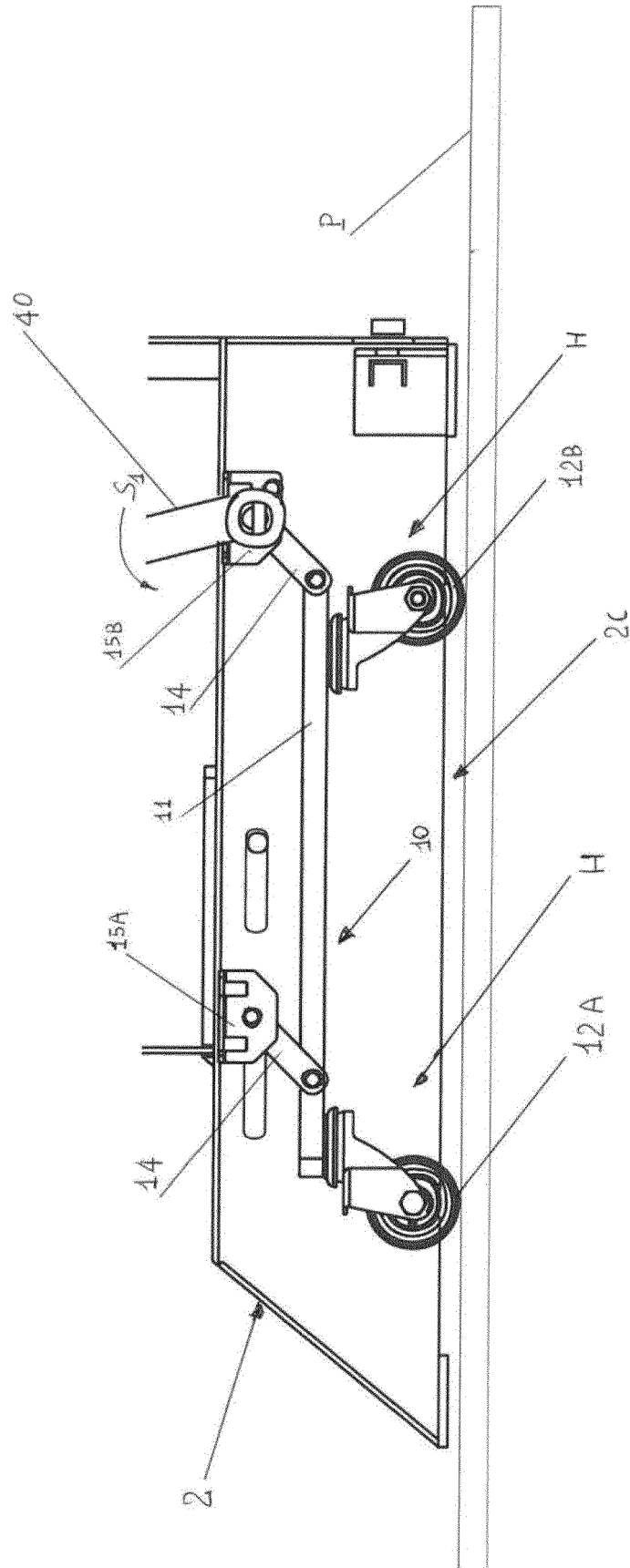


Fig. 4



EUROPEAN SEARCH REPORT

Application Number
EP 21 15 2715

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DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	KR 2015 0133892 A (TAEGIN ENGINEERING CO LTD [KR]) 1 December 2015 (2015-12-01) * figures 1-6 *	1-7	INV. D05B75/00 B25H1/04
A	----- CN 208 685 199 U (DENG RUIYING) 2 April 2019 (2019-04-02) * paragraphs [0020], [0022]; figures 1, 3 *	1-7	
A	----- DE 41 33 522 C1 (DUERKOPP ADLER AG [DE]) 9 July 1992 (1992-07-09) * column 1, line 50 - column 2, line 44; figures 1-5 *	1-7	
			TECHNICAL FIELDS SEARCHED (IPC)
			D05B B25H
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 22 March 2021	Examiner Braun, Stefanie
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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**ANNEX TO THE EUROPEAN SEARCH REPORT
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22-03-2021

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CN 208685199 U	02-04-2019	NONE	
DE 4133522 C1	09-07-1992	NONE	

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