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(54) Title: DEVICE FOR MANIPULATING, MACHINE AND MATTRESS PACKAGING METHOD

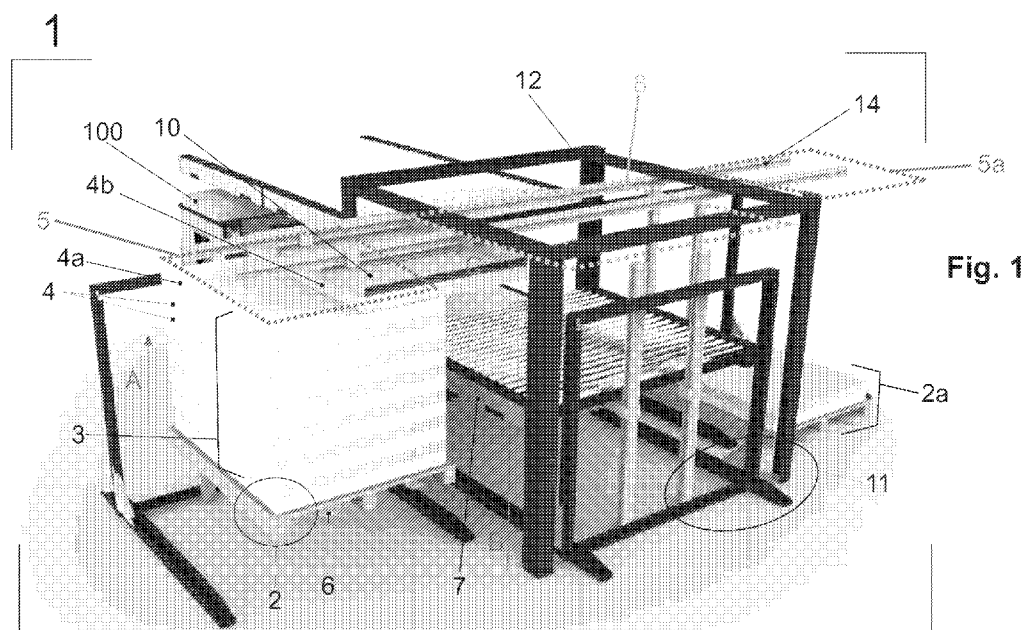


Fig. 1

(57) Abstract: Described is a device (1) for manipulating sheets for a mattress packaging machine (100) comprising at least one supporting device (2, 2a) designed to receive a stack (3) of sheets (4) designed to make a mattress. The supporting device is movable to position a first sheet (4a) at a predetermined and constant gripping position (5), thus forming a sheet being processed (4b). A conveyor (7) is designed to receive the sheet being processed (4b) and to convey it inside the packaging machine (100) at a packaging path selected from a plurality of packaging paths (P1, P2) positioned at different heights. A conveyor (7) is movable between a transfer position (8) wherein it receives the sheet being processed and a plurality of conveying positions (9a, 9b) each positioned at a packaging path. The transfer position (8) is positioned at a height greater than that of the conveying positions (9a, 9b). A transport platform (10) is movable between the gripping position (5) and the transfer position (8) to pick up the sheet being processed (4b) and to make it



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Device for manipulating, machine and mattress packaging method**DESCRIPTION****Technical field**

This invention relates to a device for handling and a machine for
5 packaging mattresses.

This invention also relates to a machine and a method for packaging
mattresses.

Background art

The prior art manipulating devices have the platform movable along
10 vertical and horizontal directions to perform all the movements necessary
for picking up a sheet intended for packaging a mattress and the
subsequent conveying inside the packaging machine.

More specifically, the known platforms, starting at the point where they
have released a sheet entering the packaging machine, carry out at least
15 six movements corresponding to a first vertical translational movement
away from the point in which the previous sheet has been released, a first
lateral translational movement until reaching a stack of sheets outside the
packaging machine, a second vertical translational movement downwards
towards the stack of sheets until it makes contact with the first of these
20 sheets, a third vertical translational movement upwards to separate the
first sheet from the stack of sheets, a second lateral translational
movement until moving above the point where the sheet is released, a
fourth vertical translational movement downwards towards the point where
the sheet is released.

25 The times for loading the packaging machine therefore depend on the
speed of the platform designed to perform all the movements required for
feeding the sheets.

The known manipulating devices therefore have a functional limit linked to
the fact that the speed of translation of the platform cannot exceed
30 determined values and that the transfer time may vary during feeding
since the platform must reach a gripping position which is variable with the

lowering of the stack of sheets.

This variation of the transfer time can be further made worse if it necessary to feed different packaging paths inside the packaging machine.

- 5 In this context, the technical purpose which forms the basis of this invention is to provide a manipulating device, a machine and a method for packaging mattresses which overcome at least some of the above-mentioned drawbacks of the prior art.

Disclosure of the invention

- 10 More specifically, the aim of this invention is to provide a manipulating device, a machine and a method for packaging mattresses which can increase the speed of feeding the sheets to a machine for packaging mattresses and to release the packaging from the position of the sheets entering and leaving the device.

15

The technical purpose indicated and the aims specified are substantially achieved by a manipulating device, a machine and a method for packaging mattresses comprising the technical features described in one or more of the appended claims. The dependent claims correspond to

20 possible different embodiments of the invention.

- More specifically, according to a first aspect, this invention relates to a device for manipulating sheets for a machine for packaging mattresses comprising a supporting device designed to receive a stack of sheets designed to make a mattress, a transport platform, movable between a
- 25 position for gripping a sheet being processed positioned at the top of the stack and a transfer position wherein the sheet being processed is made available to conveyor means. The conveyor means are designed to convey the sheet being processed inside the packaging machine at a packaging path selected from among a plurality of packaging paths
- 30 located at different heights (the drawings and description refer, by way of a non-limiting example, to two of these paths).

Preferably, the supporting device is movable for positioning a first sheet of the stack at a predetermined and constant gripping position, defining a sheet being processed.

5 Preferably, the conveyor means is movable between the transfer position in which it receives the sheet being processed from the platform and a plurality of conveying positions, each located at a packaging path.

The transfer position is preferably positioned at a height greater than that of the conveying positions.

10 In accordance with a second aspect, this invention relates to a machine for packaging mattresses comprising a manipulating device and a plurality of packaging paths located at different heights. Preferably, each packaging path is designed to receive a predetermined type of sheet of the stack.

The description denotes, by way of a non-limiting example only, a stack of a processing step, but there may be two or more than two stacks, 15 located on as many supporting devices positioned along the guide of suitable length. These different stacks might consist of sheets also with different characteristics, such as thickness, type of material, etc.

According to a further aspect, this invention relates to a method for packaging mattresses comprising preparing a stack of sheets designed to 20 make a mattress, transferring a sheet being processed from the stack to a transfer position, transferring the sheet being processed between the transfer position and a conveying position selected between a plurality of conveying positions corresponding to a plurality of packaging paths, conveying the sheet being processed towards the selected packaging 25 path.

Preferably, the stack is moved for positioning a first sheet of the stack at a predetermined and constant gripping position, defining a sheet being processed.

30 Preferably, the conveying position is positioned at a height lower than the transfer position.

According to one or more of the above-mentioned aspects, this invention

may comprise one or more of the following features.

Preferably the stack is translated vertically upwards so as to position the first sheet at the gripping position. Still more preferably, the supporting device is configured to translate vertically in such a way as to move a first
5 sheet of the stack to the gripping position.

Preferably, the sheet being processed is translated vertically between the transfer position and the conveying position. Still more preferably, the conveyor means is configured to translate vertically in both directions between the transfer position and the conveying position selected as a
10 function of the type of sheet.

The sheet being processed is preferably translated horizontally between the position for gripping and the transfer position. Still more preferably, the platform is configured to translate horizontally between the gripping position and the transfer position.

15 The gripping of the sheets may, for example, be achieved by means of curved needles which, rotating, attach to the sheet itself, or by means of needles arranged in two rows and inclined at 45° in such a way as to cross over each other when penetrating in the layer of sheets.

Or, advantageously, by means of a vacuum system with suction pumps.

20 Preferably, the supporting device comprises at least one supporting element designed to receive the stack. The supporting element is associated with a preferably vertical structure in such a way as to translate upwards for positioning the first sheet at the gripping position, and downwards for receiving a new stack of sheets.

25 Preferably, the platform comprises a supporting frame on which is mounted at least one guide which extends between the gripping position and at least the transfer position. Preferably, the guide is horizontal.

Preferably, the outer guide extends up to an outer position located on the opposite side of the gripping position. Still more preferably, the transfer
30 position is interposed between the gripping position and the outer position. For example, the outer position can be used as a further gripping position.

The conveyor means is preferably positioned inside the supporting frame. Preferably, the conveyor means is movable vertically between the guide and the packaging paths.

Preferably, there is a processing unit programmed to control the movements of the supporting device, the conveyor means and the platform. Still more preferably, these movements are controlled in such a way as to be performed partly simultaneously on different sheets.

Preferably, the processing unit is programmed to select the transfer position in which to position the conveyor means as a function of the sheet to be transferred.

Preferably, the processing unit is further programmed to control the packaging of the mattress inside the packaging machine by selecting the processing type and the packaging path for each sheet.

Preferably, each packaging path is designed to receive a predetermined type of sheet from the stack.

Further features and advantages of the invention are more apparent in the non-limiting description which follows of a preferred non-exclusive embodiment of a manipulating device, a machine and a process for packaging mattresses.

Brief description of the drawings

The description is set out below with reference to the accompanying drawings which are provided solely for purposes of illustration without restricting the scope of the invention and in which Figures 1 to 4 are schematic perspective views of a manipulating device associated with a machine for packaging mattresses, in different operating conditions.

Detailed description of preferred embodiments of the invention

The numeral 1 denotes in its entirety a manipulating device designed to be used in a mattress packaging machine 100.

The manipulating device 1 comprises at least one supporting device 2, 2a designed to receive a stack 3 of sheets 4 designed to make a mattress.

The supporting device 2, 2a is movable vertically upwards along the direction A for positioning a first sheet 4a of the stack 3 at a predetermined and constant gripping position 5, 5a.

5 The term first sheet 4a is used to denote the sheet which is positioned to the top of the stack 3 and is therefore variable, during the manipulating process, following the picking up in succession of the sheets.

The supporting device 2, 2a comprises at least one supporting element 6 designed to receive the stack 3 of sheets 4. The supporting element 6 is associated with a vertical structure 15 in such a way as to translate
10 vertically upwards in the direction A. The upward movement is such as to position the first sheet 4a at the gripping position 5.

The supporting element 6 is also preferably movable vertically downwards to be arranged in a lowered position designed to receive the next stack of sheets.

15 The manipulating device 1 also comprises conveyor means 7 designed to receive a sheet of the stack 3 and to convey it inside the packaging machine 100 at a packaging path selected from amongst a plurality of packaging paths P1, P2 located at different heights.

More specifically, the conveyor means 7 receives a sheet being processed
20 4b corresponding to the first sheet 4a which has been picked up from the stack 3.

The conveyor means 7 are movable vertically along the direction B, in both directions, between a transfer position 8 in which it receives a sheet of the stack 3 and a plurality of conveying positions 9a, 9b each located at a
25 packaging path P1, P2.

More specifically, the transfer position 8 is positioned at a height greater than that of the conveying positions 9a, 9b.

Figure 3 shows the conveying position 9a positioned at the packaging path P1; Figure 4 shows the conveying position 9b positioned at the packaging
30 path P2.

It is clear that there may be more than two conveying positions 9a, 9b and

relative packaging paths P1, P2.

The manipulating device 1 also comprises a transport platform 10 movable horizontally at least between the gripping position 5, 5a and the transfer position 8 for picking up the first sheet 4a, thus defining a sheet being processed 4b, and making it available for the conveyor means 7.

There may be multiple gripping positions, 5, 5a, etc., positioned along the guide 12.

Preferably, the platform 10 comprises a supporting frame 11 on which is mounted at least one horizontal guide 12 which extends between the gripping position 5, 5a and at least the transfer position 8.

The transport platform 10 is slidable along the horizontal guide 12 for picking up the sheet being processed 4b and transferring it to the conveyor means 7.

The sliding of the transport platform 10 is performed in the horizontal direction C in both directions.

Preferably, the horizontal guide 12 extends up to an outer position 14 positioned on the opposite side relative to the gripping position 5.

More specifically, the transfer position 8 is interposed between the gripping position 5 and the outer position 14.

The outer position 14 may advantageously define a further gripping position 5a.

Preferably, the conveyor means 7 is positioned inside the supporting frame 11, movable vertically between the horizontal guide 12 and the packaging paths P1, P2.

More specifically, the supporting frame 11 comprises a frame defining an inner space in which the conveyor 7 moves.

The frame has an inlet of the sheets coming from the stack 3 and an outlet of the sheets directed to a respective packaging path.

There may be also a processing unit, not illustrated, programmed to control the movements of the supporting device 2, of the conveyor means 7 and the platform 10 in such a way that these movements can occur

partly simultaneously operating on different sheets.

The processing unit may also be programmed to select the transfer position 9a, 9b in which to position the conveyor means 7 as a function of the sheet to transfer.

5 In accordance with a further aspect, this invention relates to a machine 100 for packaging mattresses comprising a manipulating device 1 as described above. The machine 100 also comprises a plurality of packaging paths P1, P2 located at different heights. Each packaging path P1, P2 is, for example, designed to receive a predetermined type of sheet from a
10 respective stack.

The same processing unit used for controlling the movements of the manipulating device 1 may be used for controlling the machine 100. In this case, the processing unit can be further programmed to control the packaging of the mattress inside the machine by selecting for each sheet
15 the type of processing and the packaging path P1, P2.

In accordance with this invention, the manipulation of the sheets for the packaging of a mattress extends through six movements divided between the supporting device 2, the conveyor means 7 and the platform 10. More specifically, the supporting device 2 is made in such a way as to perform
20 the vertical movement of the stack of sheets such as to provide the first of the sheets at the gripping position. The platform 10 is made in such a way as to perform a horizontal translating motion in both directions, while always remaining at the same height. The conveyor means 7 are made so as to perform a vertical movement towards and away from the platform 10
25 to provide the sheet being processed at the respective packaging path.

In use, the manipulating device 1 and the packaging machine 100 comprise a stack 3 of sheets 4 being loaded on the supporting device 2 and then raised until the first sheet 4a is in the gripping position. The platform 10 picks up the first sheet from the gripping position, thus defining
30 a sheet being processed 4b, and it translates towards the transfer position which remains at the same height as the gripping position.

Simultaneously, the supporting device 2 lifts the stack 3 in such a way that the next sheet, which has now become the first sheet 4a of the stack, is at the gripping positions 5, 5a.

5 The conveyor means 7 rise until reaching the transfer position wherein the sheet being processed 4b gripped by the platform 10 is transferred to the conveyor means 7. The conveyor means 7 are then lowered until reaching the conveying position corresponding to the packaging path which the sheet must follow inside the machine 100. The conveyor means 7 returns lastly to the transfer position.

10 Simultaneously, the platform 10 returns to the gripping position, picks up the "new" first sheet 4a defining a "new" sheet being processed 4b and translates it to the transfer position. For this reason, the conveyor means 7 will immediately find available in this transfer position a new sheet which will be made available to the corresponding packaging path.

15 For this reason, the time for moving a sheet is reduced to at least 1/3 of the movement time relative to the known manipulating devices and it is strictly correlated with the time taken by the conveyor means to move between the transfer position and the conveying position.

The device and the machine according to this invention allow operation on
20 packaging paths positioned on two or more levels thus allowing the use of a single manipulating device. The presence of different packaging paths depends on the different actions it is necessary to perform on some types of sheets. For example, some sheets must be covered at least partly with adhesive material at a gluing station provided along a corresponding
25 packaging path. Or some sheets must be applied without adhesive material above sheets already prepared and previously covered with adhesive material along a corresponding packaging path.

In the device and in the machine according to the invention the sheets may be positioned at any height and in a precise and fast manner.

30 In accordance with these aspects this invention therefore relates also to a method for packaging mattresses. According to this method a stack 3 of

sheets intended to make a mattress is prepared, for example at the supporting device 2.

The stack 3 is translated vertically upwards for positioning a first sheet 4a at a predetermined and constant gripping position 5, 5a.

- 5 The first sheet 4a is subsequently translated from the gripping position 5, 5a to the transfer position 8 by means of a single translation movement, thereby defining a sheet being processed 4b.

Lastly, the sheet being processed 4b is translated vertically between the transfer position 8 and one of the possible conveying positions 9a, 9b
10 positioned at a height lower than the transfer position.

More specifically, the conveying position is selected between a plurality of conveying positions 9a, 9b corresponding to a plurality of packaging paths P1, P2.

Lastly, the sheet being processed 4b is conveyed towards the selected
15 packaging path P1, P2.

With reference to the above-mentioned drawings, Figure 1 represents an instant after the gripping of the first sheet by the platform 10 thereby defining a sheet being processed 4b. The sheet being processed starts its translation along the direction C. At the same time, the stack 3 is raised in
20 such a way that the next sheet, which has now become the first sheet 4a of the stack, is positioned in the gripping position.

Figure 2 represents an instant after the transfer of the sheet being processed 4b from the platform 10 to the conveyor means 7. The drawing therefore corresponds to the step of lowering the conveyor means 7 along
25 the vertical direction B and to the translation of the platform 10 along the horizontal direction C to return to the gripping position. The raising of the stack 3 is not yet finished

Figure 3 illustrates the moment the platform 10 is returned in the gripping position 5 and is taking the first sheet 4a. At the same time the sheet being
30 processed 4b has reached the conveying position 9a and is conveyed along the packaging path P2.

Figure 4 represents a moment after the picking up of the further first sheet 4a which defines a new sheet being processed 4b. The stack 3 is again raised according to the vertical direction A whilst the sheet being processed 4b translates along the horizontal direction C and reaches the transfer position 8. In this case, the transfer position 8 coincides with the conveying position 9b wherein the sheet being processed 4b is conveyed along the packaging path P1.

The invention allows the sheets to be controlled with a single manipulating device, even in the presence of packaging paths positioned at several levels or heights, in a precise and fast manner, limiting the number of transport elements necessary for feeding the machine and dividing the movements in such a way as to allow them to be actuated at least partly simultaneously.

The example embodiments described above relate to a device, a machine and a method operating by means of translations in particular according to vertical and horizontal directions. Alternatively, there may be other types of movements, for example rotations or translations according to variously inclined directions whilst remaining within the scope of this invention, wherein the manipulating of the sheets for packaging mattresses is divided into separate elements in such a way that the last of these can be selectively positioned at packaging paths positioned at several levels.

CLAIMS

1. A device (1) for manipulating sheets for a mattress packaging machine (100), comprising:
- 5 at least one supporting device (2, 2a) designed to receive a stack (3) of sheets (4) designed to make a mattress, the supporting device being movable to position a first sheet (4a) of the stack at a predetermined and constant gripping position (5, 5a), thus forming a sheet being processed (4b),
- 10 a conveyor (7) designed to receive the sheet being processed (4b) and to convey it inside the packaging machine (100) at a packaging path selected from a plurality of packaging paths (P1, P2) positioned at different heights, the conveyor (7) being movable between a transfer position (8) wherein it receives the sheet being processed (4b) and a plurality of conveying positions (9a, 9b) each positioned at a packaging path, the transfer position (8) being preferably positioned at a higher height relative to the conveying positions (9a, 9b),
- 15 a transport platform (10), movable between the gripping position (5) and the transfer position (8) to pick up the sheet being processed (4b) and make it available for the conveyor means (7), wherein the platform (10) comprises a supporting frame (11) on which is mounted at least one guide (12) preferably horizontal which extends between the gripping position (5, 5a) and at least the transfer position (8), the guide (12) extending up to a outer position (14) positioned on the opposite side of the gripping position (5), the transfer position (8) being interposed between the gripping position (5) and the outer position (14), preferably the outer position (14) defining a further gripping position.
- 20
2. The manipulating device according to claim 1, wherein the supporting device (2) comprises at least one supporting element (6) designed to receive the stack (3) of sheets (4), the supporting element (6) being associated with a preferably vertical structure in such a way as to translate upwards to position the first sheet (4a) at the gripping position (5, 5a), and
- 30

downwards to receive a new stack of sheets.

3. The manipulating device according to claim 1, wherein the conveyor (7) is positioned inside the supporting frame (11), preferably vertically movable between the guide (12) and the packaging paths (P1, P2).

5 **4.** The manipulating device according to any one of the preceding claims, comprising a processing unit programmed to manage the movements of the supporting device (2), of the conveyor (7) and of the platform (10) in such a way that they are achieved partly simultaneously on different sheets, and to select the transfer position (8) wherein the conveyor (7) is
10 to be positioned as a function of the sheet to be transferred.

5. The manipulating device according to any one of the preceding claims, wherein a supporting device (2) is configured to move vertically to carry the first sheet (4a) at the gripping position (5, 5a), wherein the conveyor (7) is configured to translate vertically in both directions between the
15 transfer position (8) and the conveying position selected as a function of the type of sheet, and wherein the platform (10) is configured to translate horizontally between the gripping position (5, 5a) and the transfer position (8).

6. A mattress packaging machine (100) comprising a manipulating device
20 (1) according to any one of the preceding claims and a plurality of packaging paths (P1, P2) positioned at different heights, each packaging path (P1, P2) being designed to receive a predetermined type of sheet of the stack.

7. The mattress packaging machine according to claim 8 when dependent
25 on claim 6, wherein the processing unit is further programmed to manage the packaging of the mattress inside the packing machine by selecting the processing type and the packaging path for each sheet.

8. A mattress packaging method comprising the following steps:
preparing a stack (3) of sheets (4) designed to make a mattress,
30 moving the stack (3) to position a first sheet (4a) of the stack at a predetermined and constant gripping position (5, 5a), thus forming a sheet

being processed (4b),
transferring the sheet being processed (4b) from the gripping position (5,
5a) to a transfer position (8),
transferring the sheet being processed (4b) between the transfer position
5 (8) and a conveying position (9a, 9b) preferably positioned at a lower
height relative to the transfer position (8), the conveying position being
selected from a plurality of conveying positions (9a, 9b) corresponding to a
plurality of packaging paths (P1, P2),
conveying the sheet being processed (4b) towards the packaging path
10 selected.

9. The mattress packaging method according to claim 8, wherein the stack
(3) is translated vertically upwards in such a way as to position the first
sheet (4a) at the gripping position (5, 5a), wherein the sheet being
processed (4b) is translated horizontally between the gripping position and
15 the transfer position, and wherein the sheet being processed (4b) is
translated vertically between the transfer position and the conveying
position.

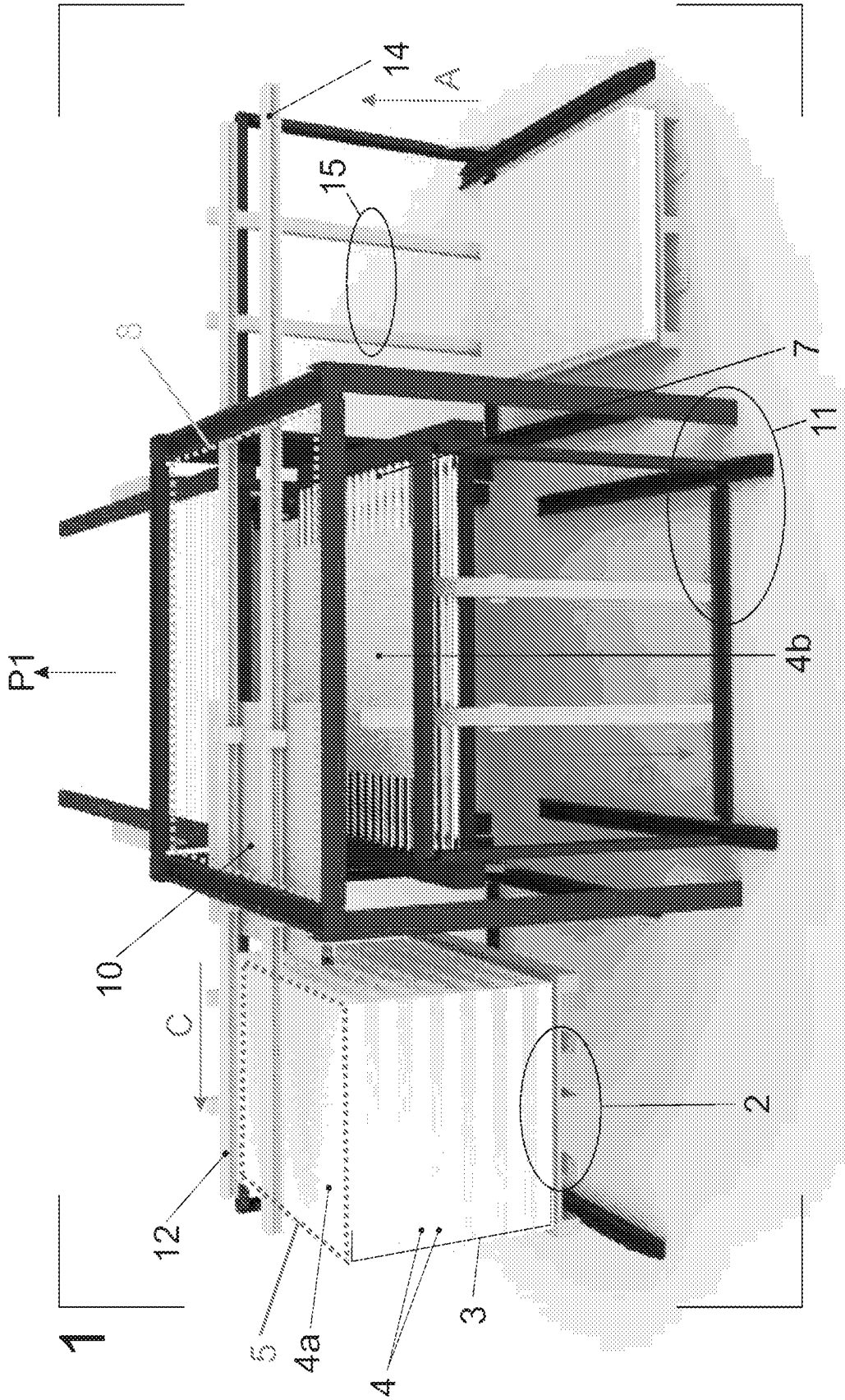
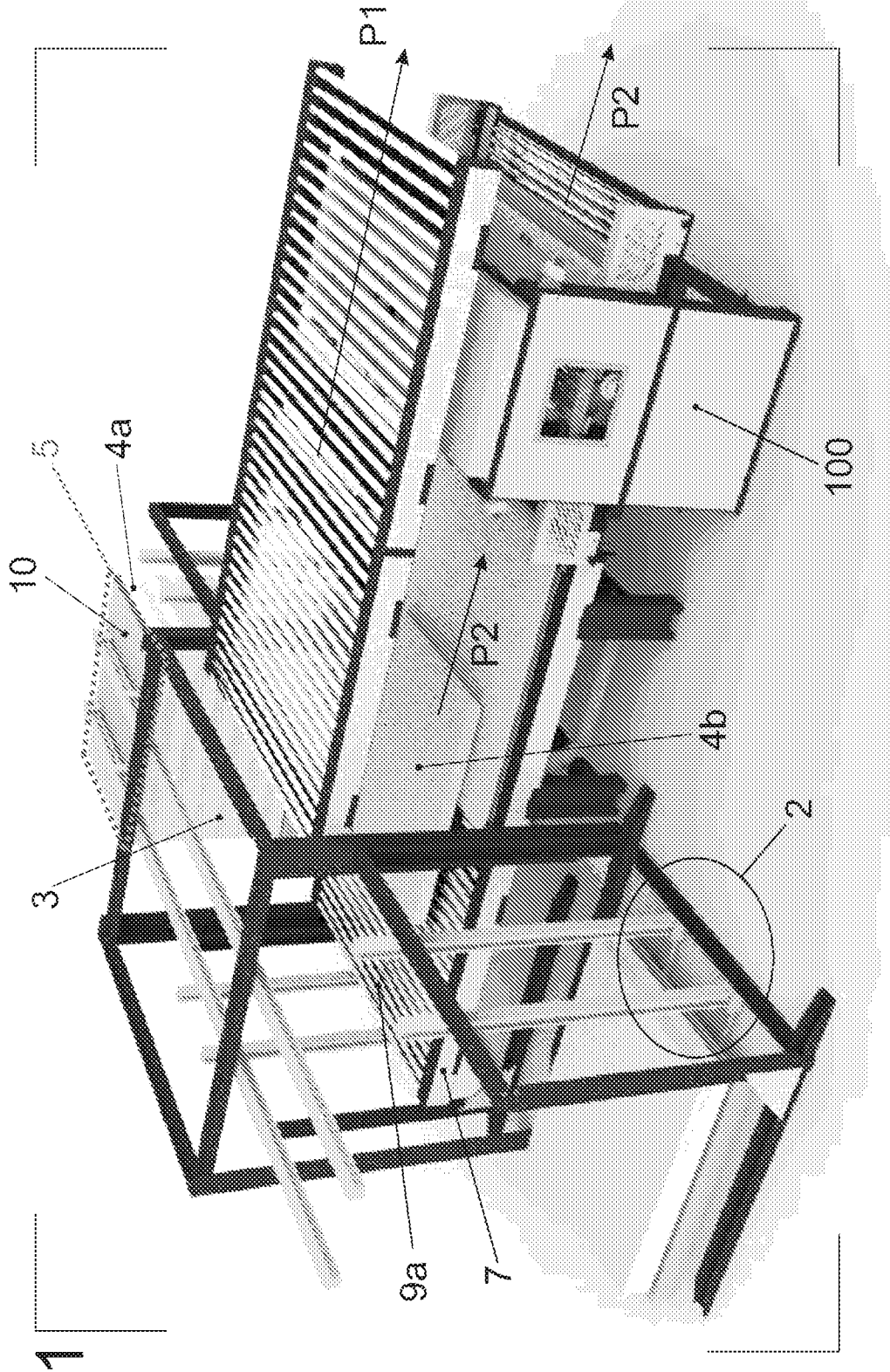


Fig. 2

Fig. 3



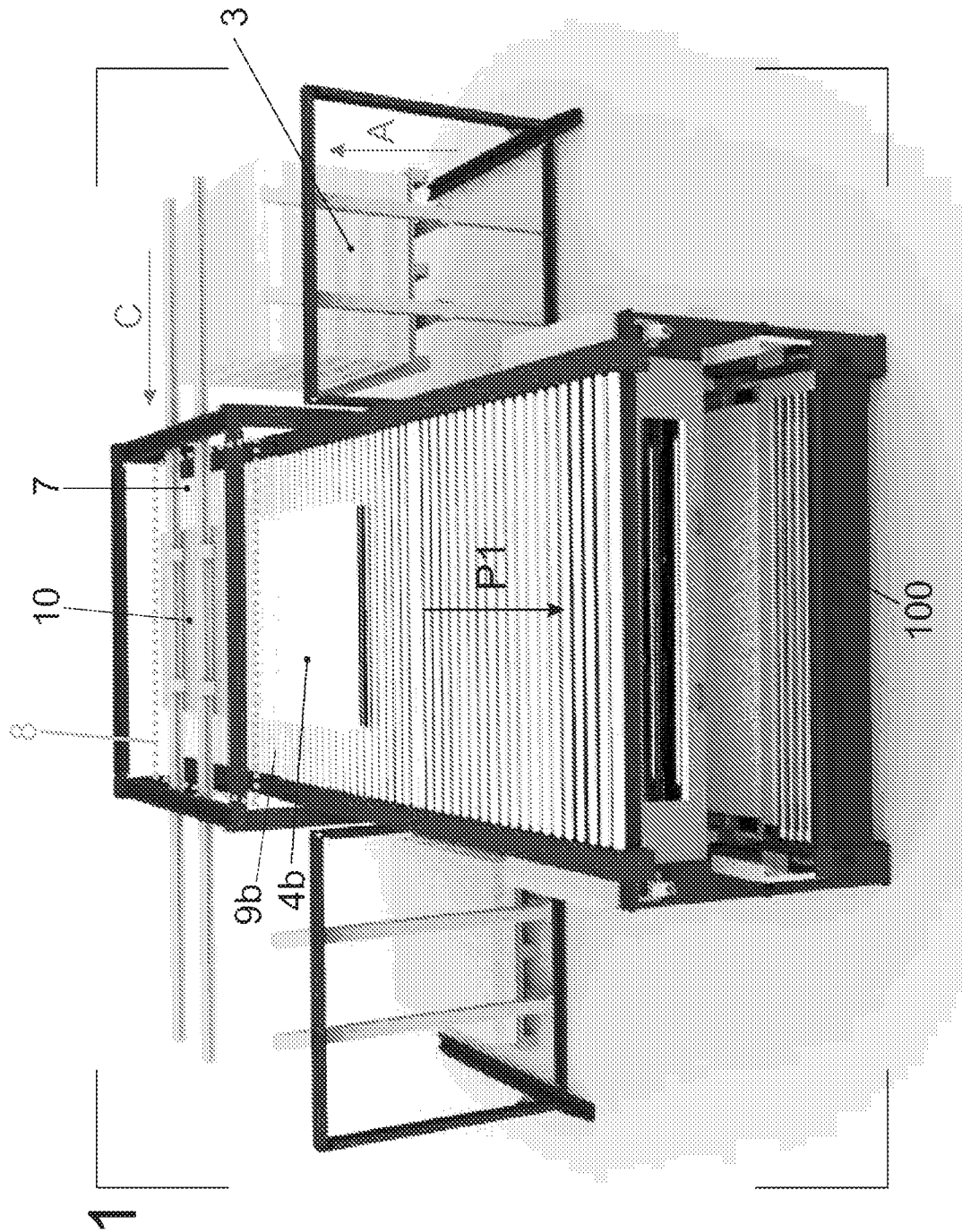


Fig. 4

INTERNATIONAL SEARCH REPORT

International application No PCT/IB2017/052461

A. CLASSIFICATION OF SUBJECT MATTER INV. B65G47/64 B65H3/08 B65H3/22 B65H5/10 B65G59/02 ADD.				
According to International Patent Classification (IPC) or to both national classification and IPC				
B. FIELDS SEARCHED				
Minimum documentation searched (classification system followed by classification symbols) B65G B65H				
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched				
Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) EPO-Internal, WPI Data				
C. DOCUMENTS CONSIDERED TO BE RELEVANT				
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.		
X	WO 2014/115108 A1 (GALLUCCI GIUSEPPE [IT]) 31 July 2014 (2014-07-31)	8,9		
A	pages 4-12; figures 1-5 -----	1-7		
A	WO 2015/015439 A1 (PIRELLI [IT]) 5 February 2015 (2015-02-05) figure 3 -----	1-9		
A	WO 2014/023730 A1 (ROTZINGER AG [CH]) 13 February 2014 (2014-02-13) figure 1 -----	1-9		
A	EP 0 354 873 A1 (TABAC FAB REUNIES SA [CH]) 14 February 1990 (1990-02-14) figure 1 -----	1-9		
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<input checked="" type="checkbox"/> Further documents are listed in the continuation of Box C. <input checked="" type="checkbox"/> See patent family annex.				
* Special categories of cited documents : <table style="width: 100%; border: none;"> <tr> <td style="width: 50%; border: none; vertical-align: top;"> "A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier application or patent but published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed </td> <td style="width: 50%; border: none; vertical-align: top;"> "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art "&" document member of the same patent family </td> </tr> </table>			"A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier application or patent but published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art "&" document member of the same patent family
"A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier application or patent but published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art "&" document member of the same patent family			
Date of the actual completion of the international search	Date of mailing of the international search report			
13 July 2017	21/07/2017			
Name and mailing address of the ISA/ European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Authorized officer Dominois, Hugo			

INTERNATIONAL SEARCH REPORT

International application No PCT/IB2017/052461

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

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