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(54) Frame for sewing upper pillows on covering shells for mattresses, machine for sewing upper pillows on covering shells for mattresses, and method of sewing upper pillows on covering shells for mattresses

(57) A frame (1) for sewing upper pillows (A) on covering shells (B) for mattresses (C), which comprises four perimetric walls (3); each wall (3) is perpendicular to the two contiguous walls (3) and comprises at least one laminar portion (4) that constitutes a resting surface, the laminar portion (4) being co-planar with a lower edge of the respective wall (3), at least one of such walls (3) comprising at least one locking element (5) for at least one component, selected from between an upper pillow (A) and a covering shell (B), arranged on a respective laminar portion (4).

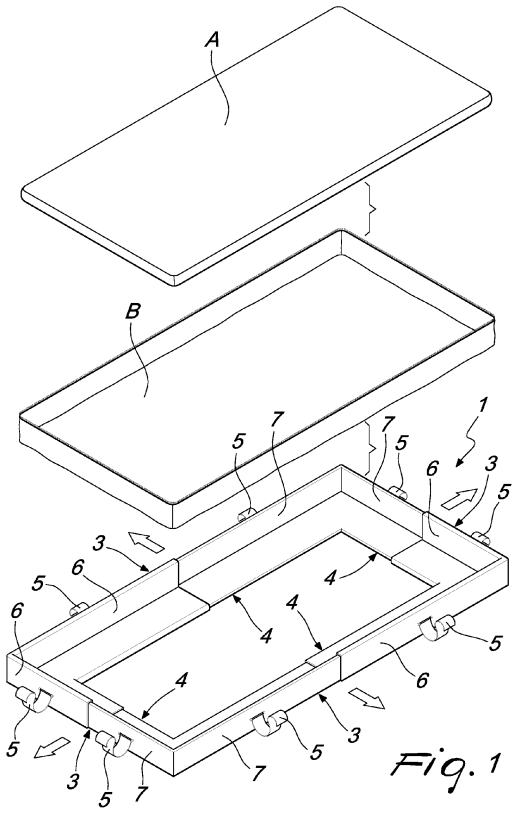

Fig. 1

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Description

[0001] The present invention relates to a frame for sewing upper pillows on covering shells for mattresses, a respective machine for sewing upper pillows on covering shells for mattresses, and a method of sewing upper pillows on covering shells for mattresses.

[0002] Mattresses have undergone considerable advances in recent years: such advances have concerned the materials that constitute them, their structure and the presence/absence of specific components.

[0003] Recently the adoption is increasingly frequent of technical solutions that involve a true mattress, parallelepiped in shape, which is contained inside two substantially mirror-symmetrical shells, which are mutually interconnected along respective facing and proximate edges.

[0004] The coupling can be fixed (for example by way of stitch lines and/or edging) or detachable (for example using zip fasteners and/or strips of Velcro® and the like).

[0005] In this type of mattress, recently we have witnessed the spread (and to the great appreciation by customers) of mattresses that are provided with an accessory component called a "pillow top".

[0006] This embodiment involves the arrangement of a slim pillow on the top of the mattress, so as to define a soft layer at the surface upon which the users lie.

[0007] The thickness of this pillow is, generally, a few centimeters (starting from a minimum of approximately one centimeter up to five or more centimeters); despite the scant thickness, the interposition of this pillow between the mattress itself and the sheet offers the user a sensation of great comfort.

[0008] It is evident that this implementation solution requires an increase in the number of steps of working on the semi-finished product that will constitute the upper shell of the mattress.

[0009] In order to ensure a sufficient qualitative standard of the finished product, placing the pillow top on the respective shell and the corresponding mutual coupling are operations that are generally performed manually by specialist craftworkers.

[0010] This therefore determines a considerable increase in the costs of mattresses provided with these pillow tops, which relates to the cost of the labor necessary for their production.

[0011] Furthermore the production times are rather long, with consequent production limits that are linked to the need for manual intervention on each one of the mattresses: an increase in productivity is necessarily associated with the hiring of additional specialist craftworkers, who are able to carry out the necessary work.

[0012] The artisan nature of the work, furthermore, does not permit a standardization of the product within narrow margins, without providing for a high number of production discards.

[0013] The principal aim of the present invention is to solve the above mentioned drawbacks, by providing a frame for sewing upper pillows on covering shells for mattresses which makes it possible to juxtapose the pillow top and the respective covering shell in a simplified manner, thus facilitating their subsequent coupling.

[0014] Within this aim, an object of the invention is to provide a machine for sewing upper pillows on covering shells for mattresses, which is entirely automated.

[0015] Another object of the invention is to provide a machine for sewing upper pillows on covering shells for mattresses which has a high rate of productivity.

[0016] Another object of the invention is to provide a machine for sewing upper pillows on covering shells for mattresses which makes it possible to obtain a constant qualitative standard of the semi-finished products that it produces.

[0017] Another object of the invention is to provide a method of sewing upper pillows on covering shells for mattresses which is simplified and which requires a minimal application of labor.

[0018] Another object of the present invention is to provide a frame for sewing upper pillows on covering shells for mattresses, a machine for sewing upper pillows on covering shells for mattresses, and a method of sewing upper pillows on covering shells for mattresses, which are low cost, are easily and practically implemented, and are practical and safe in use.

[0019] This aim and these objects are achieved by a frame for sewing upper pillows on covering shells for mattresses, characterized in that it comprises four perimetric walls, each wall being perpendicular to the two contiguous walls and comprising at least one laminar portion that constitutes a resting surface, said laminar portion being co-planar with a lower edge of said wall, at least one of said walls comprising at least one locking element for at least one component, selected from between an upper pillow and a covering shell, arranged on a respective laminar portion.

[0020] This aim and these objects are also achieved by a machine for sewing upper pillows on covering shells for mattresses, characterized in that it comprises a supporting structure for at least one coupling frame for upper pillows and covering shells for mattresses, which is associated with respective movement elements that are arranged on said structure, and a guiding track for at least one sewing head, said sewing head being translationally moveable along said track in a direction at right angles to the direction of motion of said frame on said structure, said frame having a substantially rectangular shape and comprising at least one laminar portion that is co-planar with a lower edge thereof, said frame comprising at least one locking element for upper pillows and covering shells for mattresses arranged on the at least one said laminar portion.

[0021] The above mentioned aim and objects are further achieved by means of a method of sewing upper pillows on covering shells for mattresses, which consists of:

- arranging a covering shell for mattresses on a coupling frame the dimensions and shape of which are complementary to those of said shell, said frame comprising at least one laminar portion that is coplanar with a lower edge thereof;
- juxtaposing, on said covering shell accommodated in said frame, a respective upper pillow;
- coupling, by means of at least one locking element of said frame, said upper pillow and the respective covering shell for mattresses on the at least one said laminar portion;
- aligning said frame, within which said shell and said upper pillow are mutually juxtaposed and accommodated, with a sewing head that surmounts said frame, for the coupling, by way of stitch lines, of said upper pillow and said covering shell.

[0022] Further characteristics and advantages of the invention will become better apparent from the detailed description that follows of a preferred, but not exclusive, embodiment of the frame for sewing upper pillows on covering shells for mattresses, of the machine for sewing upper pillows on covering shells for mattresses, and of the method of sewing upper pillows on covering shells for mattresses, according to the invention, which are illustrated by way of non-limiting example in the accompanying drawings, wherein:

Figure 1 is a schematic perspective view of a frame for sewing upper pillows on covering shells for mattresses according to the invention, above which the respective shell and the respective pillow are shown exploded;

Figure 2 is a schematic perspective view of the frame in Figure 1 accommodating the respective shell, surmounted by the respective pillow;

Figure 3 is a schematic perspective view of the frame in Figure 1 accommodating the respective shell and the respective pillow;

Figure 4 is a schematic perspective view of the frame in Figure 3 during the step of stitching the pillow to the shell;

Figure 5 is a schematic perspective view of the manufactured article constituted by the shell to which the respective pillow is coupled;

Figure 6 is an exploded perspective view of a mattress constituted by a central body comprised between two covering shells, in which the upper shell is coupled to the respective pillow;

Figure 7 is a schematic perspective view of a machine for sewing upper pillows on covering shells for mattresses according to the invention, in a first step of operation;

Figure 8 is a schematic perspective view of the machine in Figure 7 in a second step of operation;

Figure 9 is a schematic perspective view of the machine in Figure 7 in a third step of operation;

Figure 10 is a schematic perspective view of the machine in Figure 7 in a fourth step of operation.

[0023] With reference to the figures, the reference numeral 1 generally designates a frame for sewing upper pillows A on covering shells B for mattresses C, and the reference numeral 2 generally designates a machine for sewing upper pillows A on covering shells B for mattresses C.

[0024] The frame 1 for sewing upper pillows A on covering shells B for mattresses C comprises four perimeter walls 3.

[0025] Each one of the walls 3 is perpendicular to the two contiguous walls 3 and comprises at least one laminar portion 4 that constitutes a resting surface: in practice such laminar portion 4 defines a sort of shelf that is coplanar with a lower edge of the respective wall 3.

[0026] It is further necessary to specify that at least one of the walls 3 comprises at least one locking element 5 for at least one component, selected from between an upper pillow A and a covering shell B, arranged resting on a respective laminar portion 4.

[0027] It should be noted that each wall 3 can effectively comprise at least two bands 6 and 7 that are mutually aligned and can slide with respect to each other in order to vary the overall length of the wall 3 that they define.

[0028] According to a particular embodiment, such bands 6 and 7 are angular in shape: the angular bands 6 will define two mutually opposite corner edges of the frame 1 and the angular bands 7 will define the two remaining corner edges (which are also mutually opposite). According to the embodiment described in the accompanying figures, the bands 7 will be accommodated in respective axial cavities of the bands 6, being able to slide inside them.

[0029] The possibility is not ruled out that each wall 3 can comprise at least two coaxial bars, one inside the other, which can slide telescopically in order to vary the overall length of the wall 3 that they constitute: such bands will preferably be associated with laminar elements that are adapted to delimit the surface of each wall 3.

[0030] The at least one laminar portion 4, which constitutes the resting surface for the shell B, can extend for the entire length of the respective wall 3. In such case the laminar portions 4 will define a lower resting border that lies on the plane that contains the lower edge of the walls 3.

[0031] It should further be noted that each wall 3 will advantageously comprise at least one respective locking element 5 of the at least one component arranged on a respective laminar portion 4.

[0032] More specifically each locking element 5 is movable from a free configuration, in which one of its ends is spaced from a respective laminar portion 4, to a coupling configuration, in which the same end faces and is proximate to the respective laminar portion 4 in order to fasten the at least one component, selected from be-

tween an upper pillow A and a covering shell B, which is interposed between them.

[0033] It is evident that an effective positioning can be obtained by adopting several locking elements 5 in each wall 3, so as to ensure a good level of stability of the shell B and of the pillow A.

[0034] The locking elements 5 can be elastically deformable contoured plates that are pivoted to the wall 3.

[0035] The possibility is not excluded of adopting, as locking elements 5, actual clamps that are conveniently pivoted to the wall 3, sliders that can be locked in preset positions, or any other coupling means that make it possible to stably and detachably fix the shell B and the pillow A on the portion 4.

[0036] The possibility of varying the length of each wall 3 of the frame 1 is advantageous in terms of the versatility that it assumes: in fact it can be used indifferently for locking shells B and pillows A that are intended for mattresses C for a single bed, for a twin bed, for a double bed and/or mattresses C with nonstandard measurements.

[0037] Note should also be taken of the characteristics of the machine 2 for sewing upper pillows A on covering shells B for mattresses C; such machine comprises a supporting structure 8, for the coupling frame 1.

[0038] The supporting structure 8 comprises movement elements 9 and 10: in particular these are toothed belts and/or chains that can be coupled to the frame 1 for its entrainment.

[0039] The entrainment of each frame 1 will be carried out according to two different methods: a first method relates to the transfer of the frame 1 from the loading station (which is generally arranged on one side of the machine 2) to a sewing station (which can be arranged at the opposite end, for machines 2 with a simpler structure, or in a central portion of the machine 2, for machines 2 that are provided with two mutually opposite loading stations).

[0040] In the second method the movement imparted by the belts and/or by the chains and provided by a respective actuation motor will be controlled by the sewing operations.

[0041] The possibility is not excluded of providing a machine 2 that is provided with at least one loading station on multiple superimposed levels: at a lower level there is a frame 1, which is loaded with the shell B and the pillow A (which are superimposed and locked in place), and which will be transferred to the sewing station, while at an upper level there is a frame 1 that is empty (or which contains a shell B and a pillow A that are mutually interconnected with lines or sections of stitching) for the loading (or unloading) operations.

[0042] The machine 1 further comprises a guiding track 11 for at least one sewing head 12; the sewing head 12 can perform a translational movement along the rail 11 in a direction at right angles to the direction of motion of the frame 1 on the structure 8.

[0043] It should conveniently be pointed out that the structure 8 will comprise positively a recess 8a at the sewing head 12: such recess 8a must allow the needle of the sewing head 12 to move to a level lower than that of the structure 8 itself (thus passing through the shell B and the pillow A that are placed on the frame 1 that is arranged on the structure 8) in order to complete each stitch via a respective abutment 13.

[0044] It should be noted that, similarly to what is described previously, the frame 1 will preferably have a substantially rectangular shape and will comprise at least one laminar portion 4 that is co-planar with a lower edge thereof; the frame 1 will further comprise at least one locking element 5 for upper pillows A and covering shells B for mattresses C arranged on the at least one laminar portion 4.

[0045] According to a particular embodiment of undoubted practical and applicative interest, the guiding track 11 can be arranged substantially at the centerline of the machine 2, and in such case the structure 8 will be constituted by a sliding surface of size adapted to the accommodation and movement of at least one frame 1: such movement elements 9 and 10, as noted previously, will be of the type selected from between belts, preferably of the toothed type, and chains.

[0046] This construction choice is dictated by the necessity to precisely define the instantaneous position of the frame 1 at every moment: the presence of teeth (toothed belts) or links (chains) enables a very precise movement of the frame 1 on the structure 8.

[0047] The movement elements 9 and 10 are coupled to at least one respective actuation motor that is controlled by a control and management unit which is also associated with the sewing head 12 for the coordinated movement of the head 12 along the track 11 and of the frame 1, through the elements 9 and 10, on the structure 8. The coordinated movement makes it possible to provide lines and portions of stitching of any length, direction, and shape, optionally even with superimpositions thereof, which enable the creation di embroidery, patterns and the like.

[0048] The expediency of having two separate movement elements 9 and 10 is particularly advantageous in that it makes it possible to keep one frame 1 still (for the loading and unloading operations), while the other is facing toward the sewing head 12 and is moved by the respective element 9 or 10 which is controlled by the movements of the sewing head 12 on the respective rail 11: the coordination of the two motions described is driven by the control and management unit.

[0049] Finally, it should be noted that the sewing head 12 is functionally associated with a respective abutment 13 (previously mentioned) that is controlled by it: such abutment 13 is adapted to the completion of the sewing operations (comprising thus the elements necessary for the formation of the single stitch, such as the crochet hook and the corresponding spool of thread).

[0050] With regard to the production of shells B coupled to respective upper pillows A with which to provide

the upper covering of a mattress C, it is possible to adopt a sewing method that consists of a series of consecutive steps.

[0051] Firstly it is necessary to arrange a covering shell B for mattresses C on a coupling frame 1 of complementary size and shape to the size and shape of the shell B. The frame 1 must necessarily comprise at least one laminar portion 4 that is co-planar with a lower edge thereof.

[0052] Subsequently a respective upper pillow A will need to be juxtaposed on the covering shell B accommodated in the frame 1.

[0053] Such juxtaposition will be facilitated by the presence of the walls 3 of the frame 1 which will guide the insertion of the pillow A, imposing the correct centering thereof with respect to the frame 1.

[0054] It will then be necessary to couple, by means of the at least one locking element 5 of the frame 1, the upper pillow A and the respective covering shell B for mattresses C on the at least one laminar portion 4.

[0055] Then comes a step of alignment of the frame 1, within which the shell B and the upper pillow A are mutually juxtaposed and accommodated, with a sewing head 12 that surmounts the frame 1: the head 12 will perform the coupling, by way of stitch lines, of the upper pillow A and the covering shell B.

[0056] It should be noted that, before the step of arranging the shell B and the pillow A within the frame 1, there is a step of adjustment of the length of the walls of the frame 1: each wall 3 is in fact constituted by at least two components (for example two bands 6 and 7) that can translationally move with respect to each other in order to determine a variation of the overall length of the wall 3 that they define.

[0057] It is further emphasized that, following the translational movement of the frame 1, containing the shell B and the pillow A, and following the sliding of the sewing head 12 along a respective guiding track 11, the stitch lines can have any orientation, shape and/or pattern.

[0058] Advantageously, the present invention solves the above mentioned drawbacks by providing a frame 1 for sewing upper pillows A on covering shells B for mattresses C which makes it possible to juxtapose the pillow top A and the respective covering shell B in a simplified manner, thus facilitating their subsequent coupling.

[0059] Conveniently, the machine 2 for sewing upper pillows A on covering shells B for mattresses C is completely automated.

[0060] Positively such automation of the machine 2 determines a high rate of productivity thereof.

[0061] Conveniently, the above mentioned automation of the machine 2 makes it possible to obtain a constant qualitative standard of the semi-finished products that it produces.

[0062] Positively the method of sewing upper pillows A on covering shells B for mattresses C according to the invention is particularly simplified, requiring a minimal application of labor.

[0063] The invention, thus conceived, is susceptible of numerous modifications and variations, all of which are within the scope of the appended claims. Moreover, all the details may be substituted by other, technically equivalent elements.

[0064] In the embodiments illustrated, individual characteristics shown in relation to specific examples may in reality be interchanged with other, different characteristics, existing in other embodiments.

[0065] In practice, the materials employed, as well as the dimensions, may be any according to requirements and to the state of the art.

[0066] The disclosures in Italian Patent Application No. BO2013A000099 from which this application claims priority are incorporated herein by reference.

[0067] Where technical features mentioned in any claim are followed by reference signs, those reference signs have been included for the sole purpose of increasing the intelligibility of the claims and accordingly, such reference signs do not have any limiting effect on the interpretation of each element identified by way of example by such reference signs.

Claims

1. A frame for sewing upper pillows (A) on covering shells (B) for mattresses (C), **characterized in that** it comprises four perimetric walls (3), each wall (3) being perpendicular to the two contiguous walls (3) and comprising at least one laminar portion (4) that constitutes a resting surface, said laminar portion (4) being co-planar with a lower edge of said wall (3), at least one of said walls (3) comprising at least one locking element (5) for at least one component, selected from between an upper pillow (A) and a covering shell (B), arranged on a respective laminar portion (4).

2. The frame according to claim 1, **characterized in that** each wall (3) comprises at least two bands (6, 7) that are mutually aligned and can slide with respect to each other in order to vary the overall length of the wall (3).

3. The frame according to claim 1, **characterized in that** each wall (3) comprises at least two coaxial bars, one inside the other, which can slide telescopically in order to vary the overall length of the wall (3).

4. The frame according to claim 1, **characterized in that** said at least one laminar portion (4) that constitutes a resting surface is extended along the entire length of the respective wall (3), said laminar portions (4) of said walls (3) defining a lower resting border that lies on the plane that contains the lower edge of said walls (3).

5. The frame according to claim 1, **characterized in**

that each one of said walls (3) comprises at least one respective element (5) for locking the at least one component arranged on a respective laminar portion (4), each said locking element (5) being movable from a free configuration, in which one of its ends is spaced from a respective laminar portion (4), to a coupling configuration, in which said end faces and is proximate to the respective laminar portion (4) in order to fasten the at least one component, selected from between an upper pillow (A) and a covering shell (B), which is interposed between them.

6. A machine for sewing upper pillows (A) on covering shells (B) for mattresses (C), **characterized in that** it comprises a supporting structure (8) for at least one coupling frame (1) for upper pillows (A) and covering shells (B) for mattresses (C), which is associated with respective movement elements (9, 10) that are arranged on said structure (8), and a guiding track (11) for at least one sewing head (12), said sewing head (12) being translationally moveable along said track (11) in a direction at right angles to the direction of motion of said frame (1) on said structure (8), said frame (1) having a substantially rectangular shape and comprising at least one laminar portion (4) that is co-planar with a lower edge thereof, said frame (1) comprising at least one locking element (5) for upper pillows (A) and covering shells (B) for mattresses (C) arranged on the at least one said laminar portion (4).

7. The machine according to claim 6, **characterized in that** said guiding track (11) is arranged substantially at the centerline of said machine (2), said structure (8) being provided with a respective recess (8a) for the passage of the needle of the head (12) up to a respective abutment (13) arranged below said structure (8).

8. The machine according to claim 6, **characterized in that** said movement elements (9 and 10) are of the type selected from between belts, preferably of the toothed type, and chains, said movement elements (9 and 10) being coupled to at least one respective actuation motor that is controlled by a control and management unit which is also associated with said sewing head (12) for the coordinated movement of the head (12) along the track (11) and of the frame (1), through the elements (9 and 10), on the structure (8).

9. A method for sewing upper pillows (A) on covering shells (B) for mattresses (C), which comprises the steps of

- arranging a covering shell (B) for mattresses (C) on a coupling frame (1) dimensions and shape of which are complementary to those of said shell (B), said frame (1) comprising at least one laminar portion (4) that is co-planar with a lower edge thereof;
- juxtaposing, on said covering shell (B) accommodated in said frame (1), a respective upper pillow (A);
- coupling, by means of at least one locking element (5) of said frame (1), said upper pillow (A) and the respective covering shell (B) for mattresses (C) on the at least one said laminar portion (4);
- aligning said frame (1), within which said shell (B) and said upper pillow (A) are mutually juxtaposed and accommodated, with a sewing head (12) that surmounts said frame (1), for the coupling, by way of stitch lines, of said upper pillow (A) and said covering shell (B).

10. The method according to claim 9, **characterized in that** before said step of arranging said shell (B) within said frame (1) there is a step of adjusting the length of the walls (3) of said frame (1), each wall (3) being constituted by at least two components that can translationally move with respect to each other in order to determine a variation of the overall length of the wall (3) that they define.

11. The method according to claim 9, **characterized in that**, following the translational movement of said frame (1) containing said shell (B) and said pillow (A), and following the sliding of said sewing head (12) along a respective guiding track (11), said stitch lines have any orientation, shape and/or pattern.

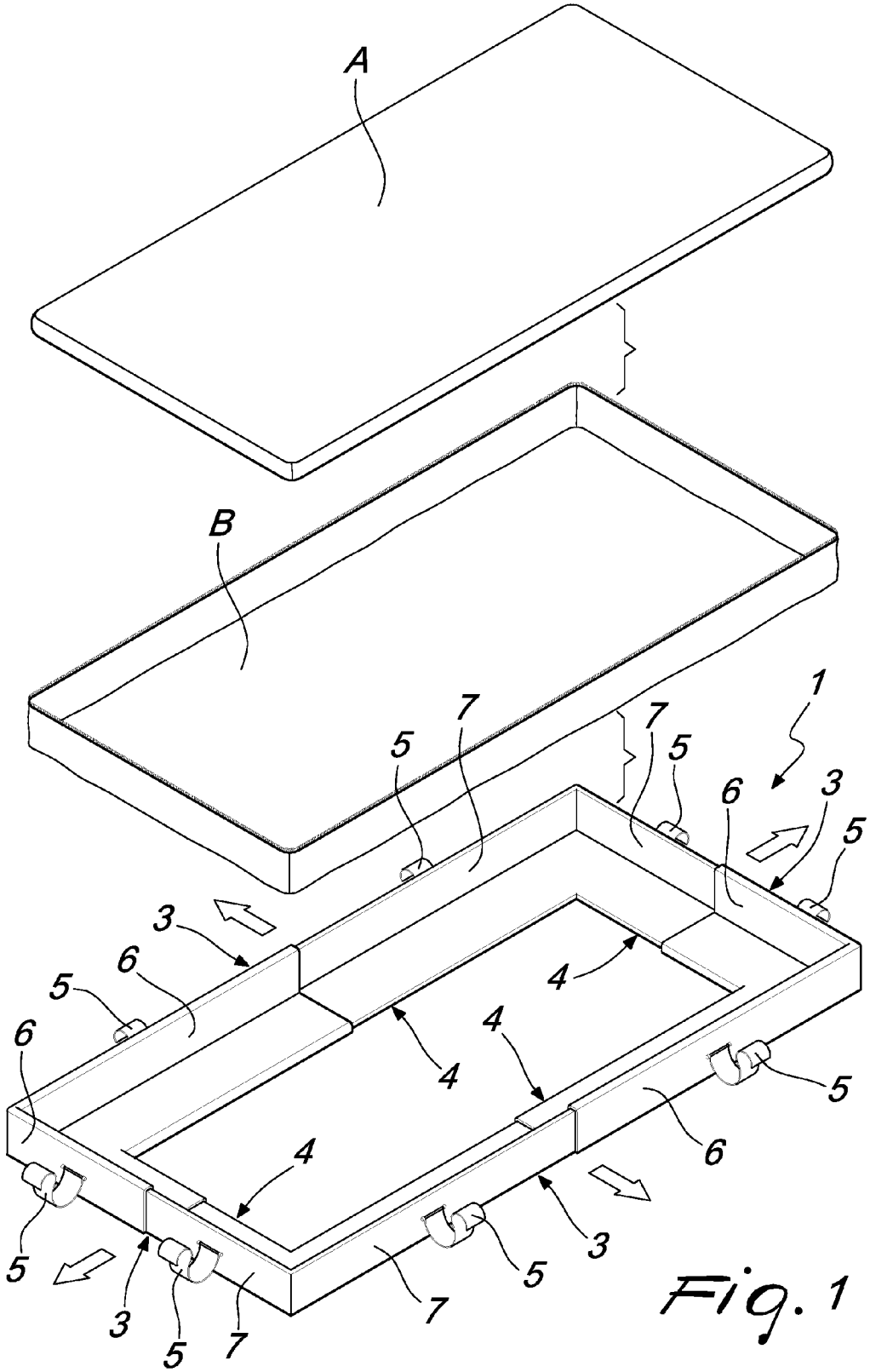

Fig. 1

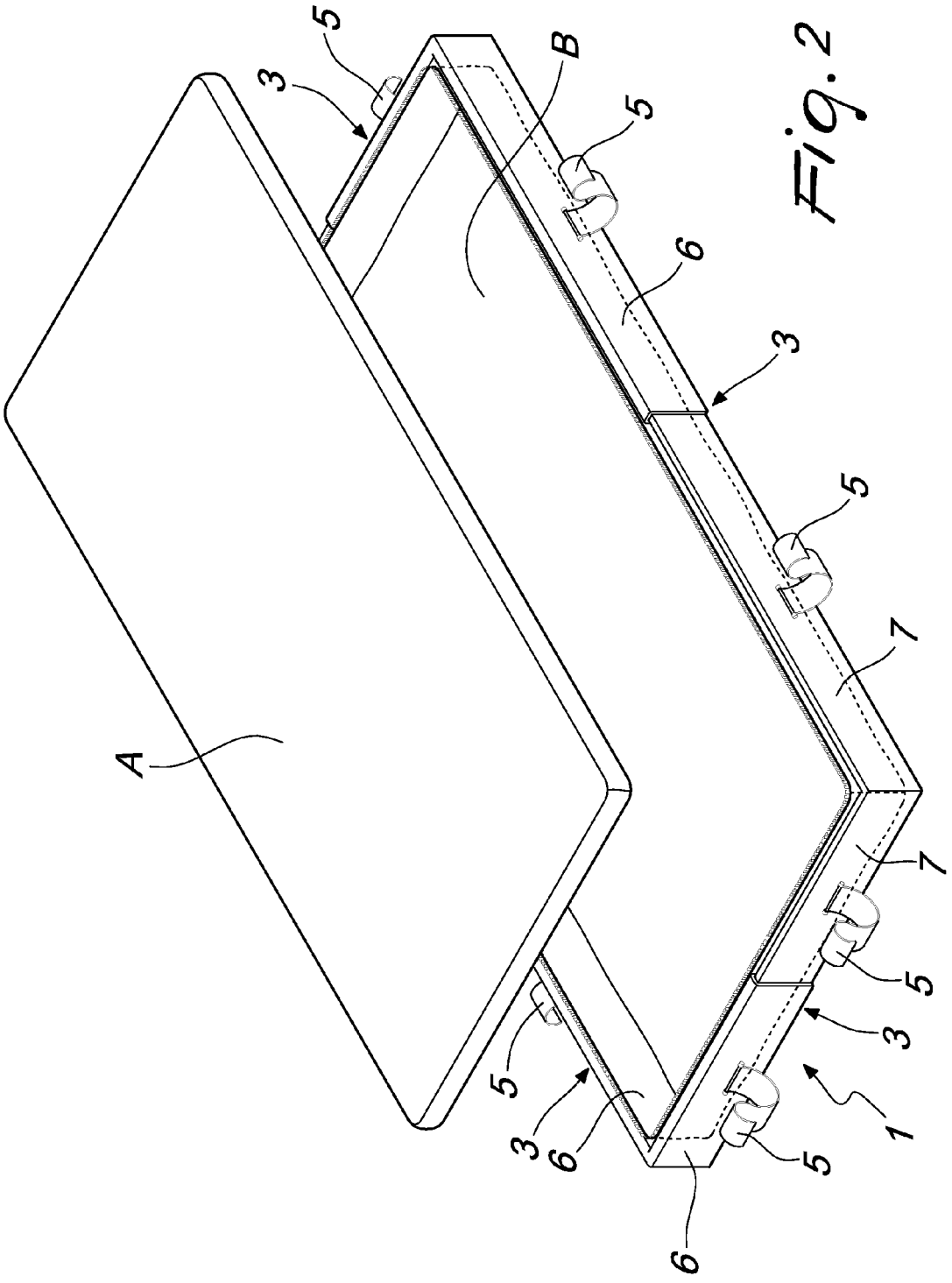

Fig. 2

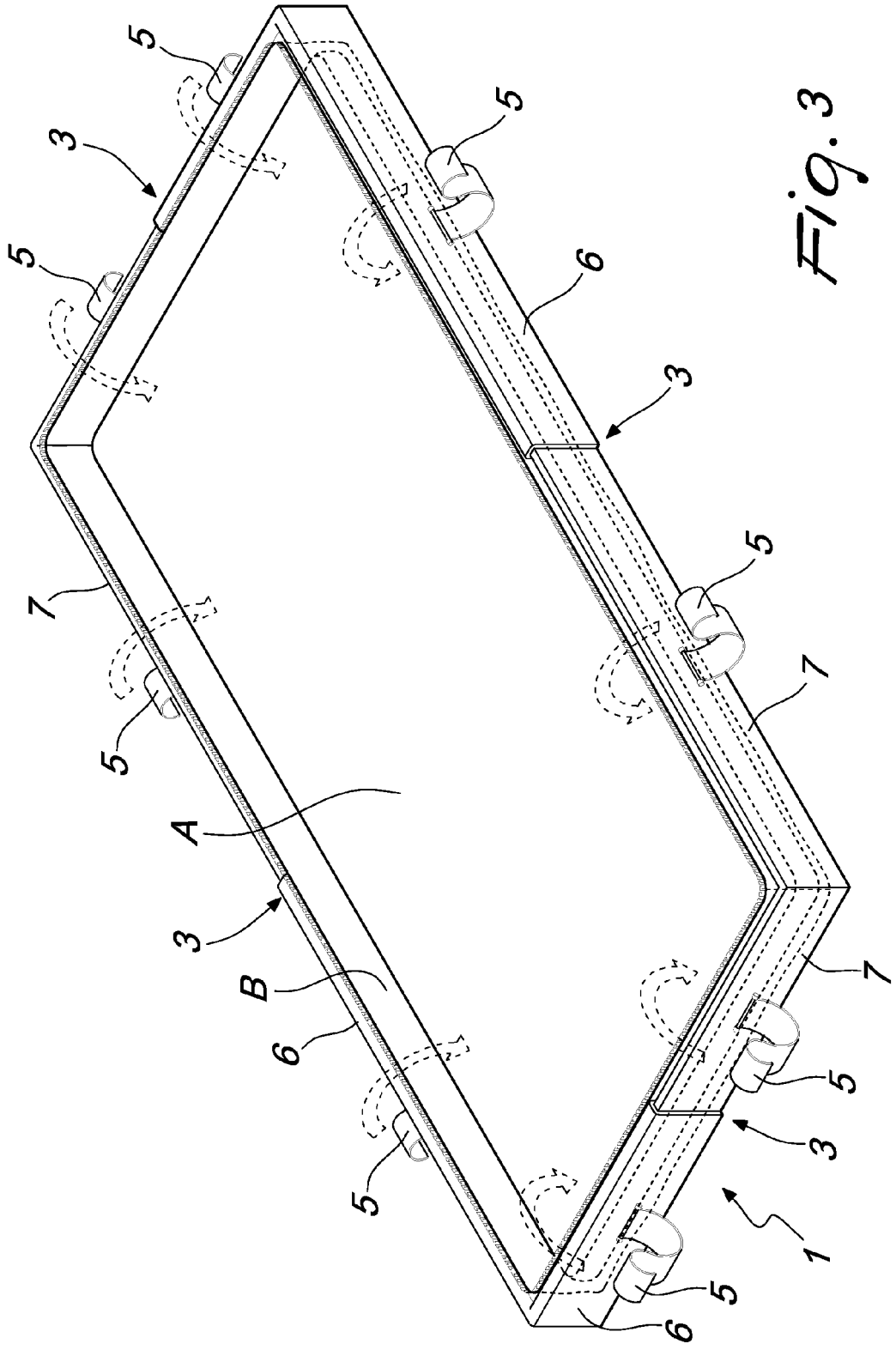

Fig. 3

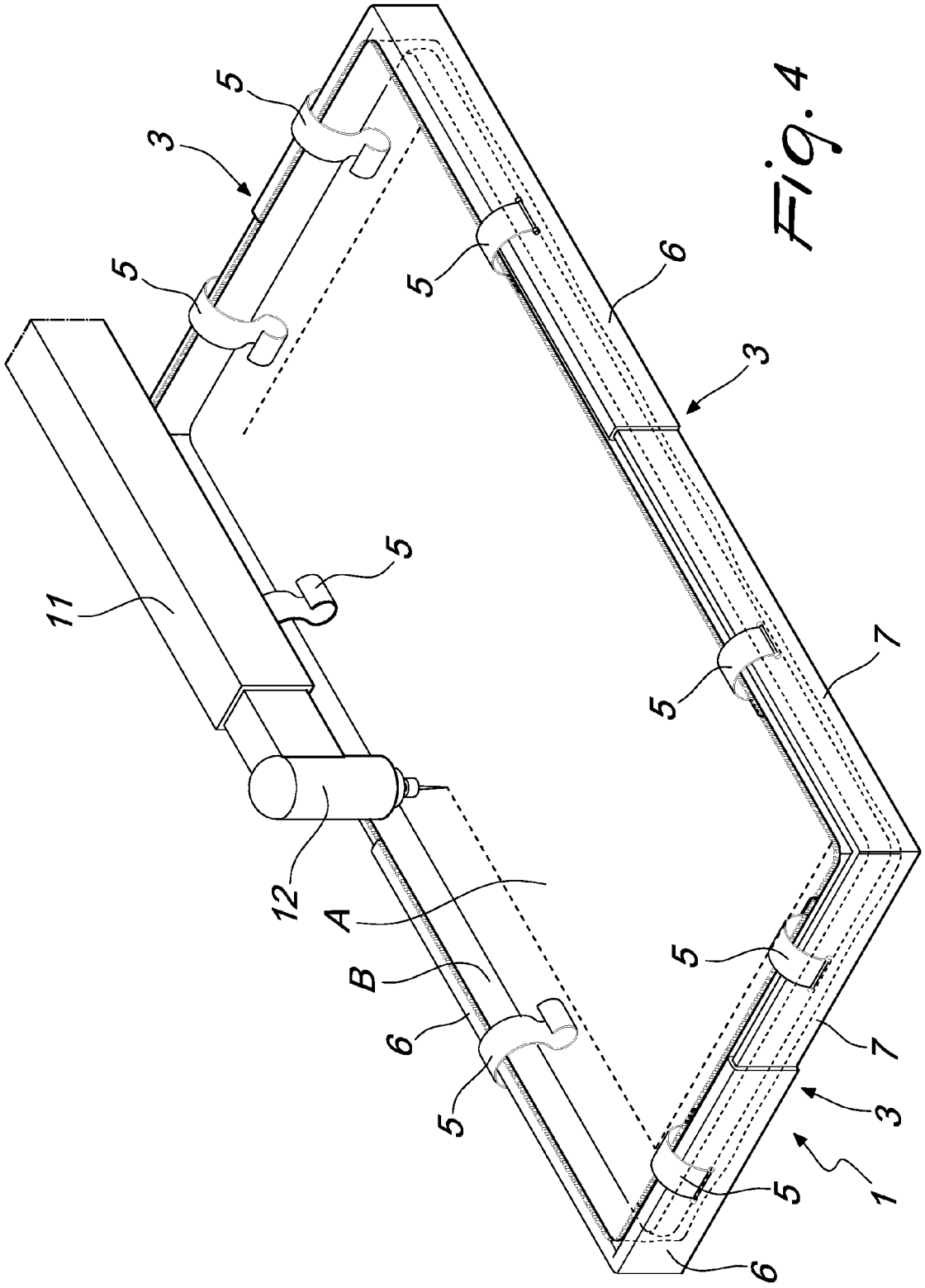

Fig. 4

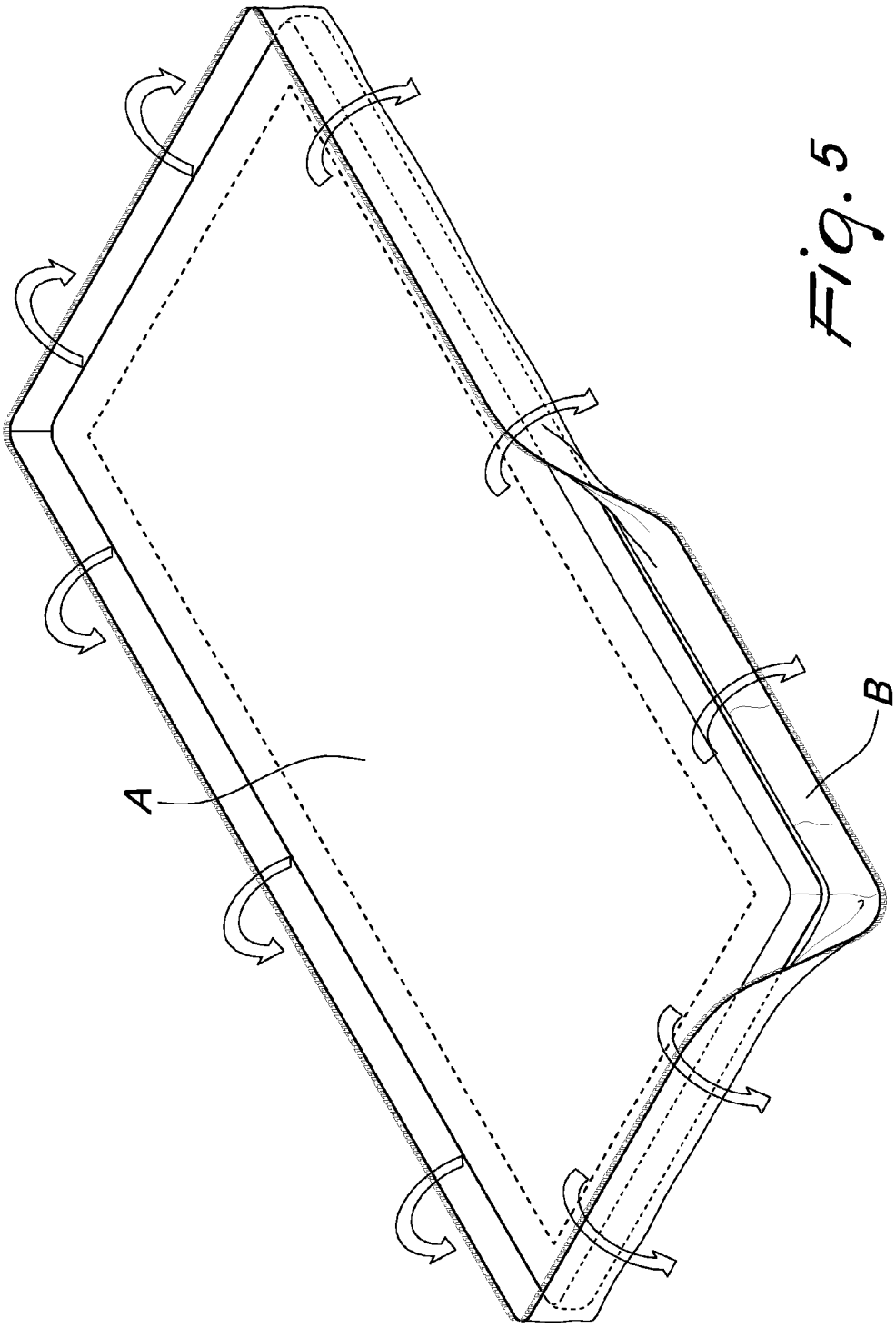

Fig. 5

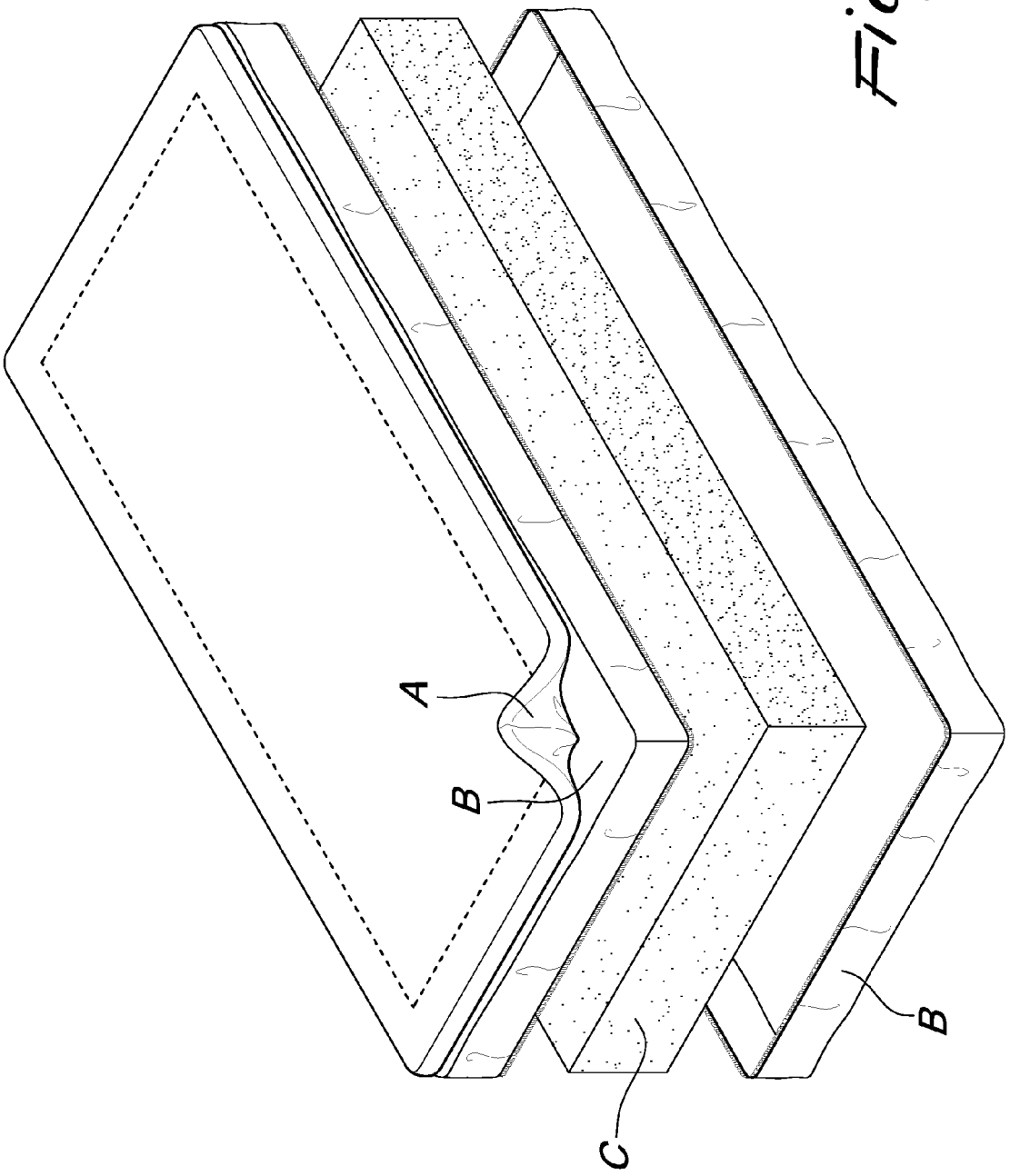

Fig. 6

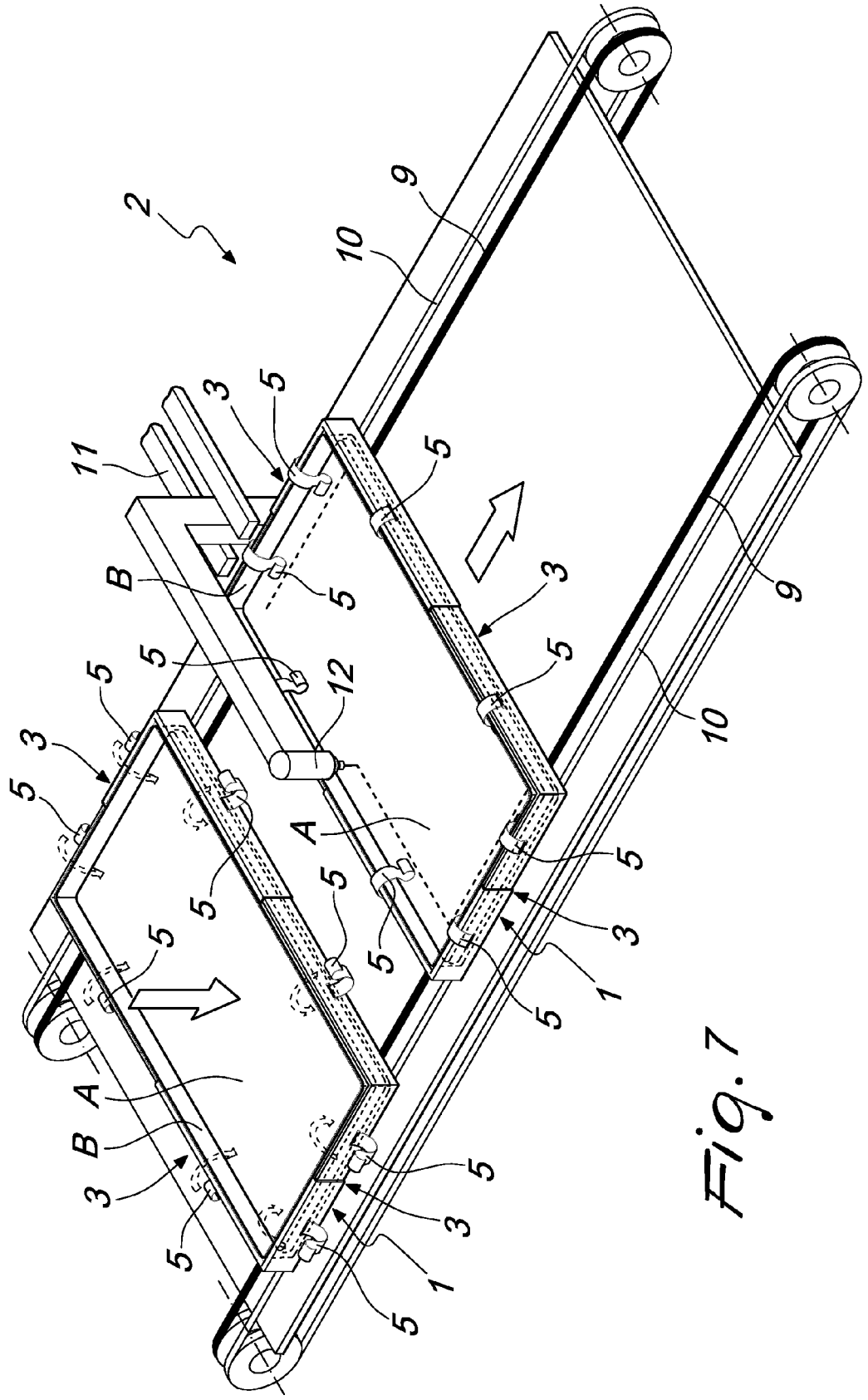

Fig. 7

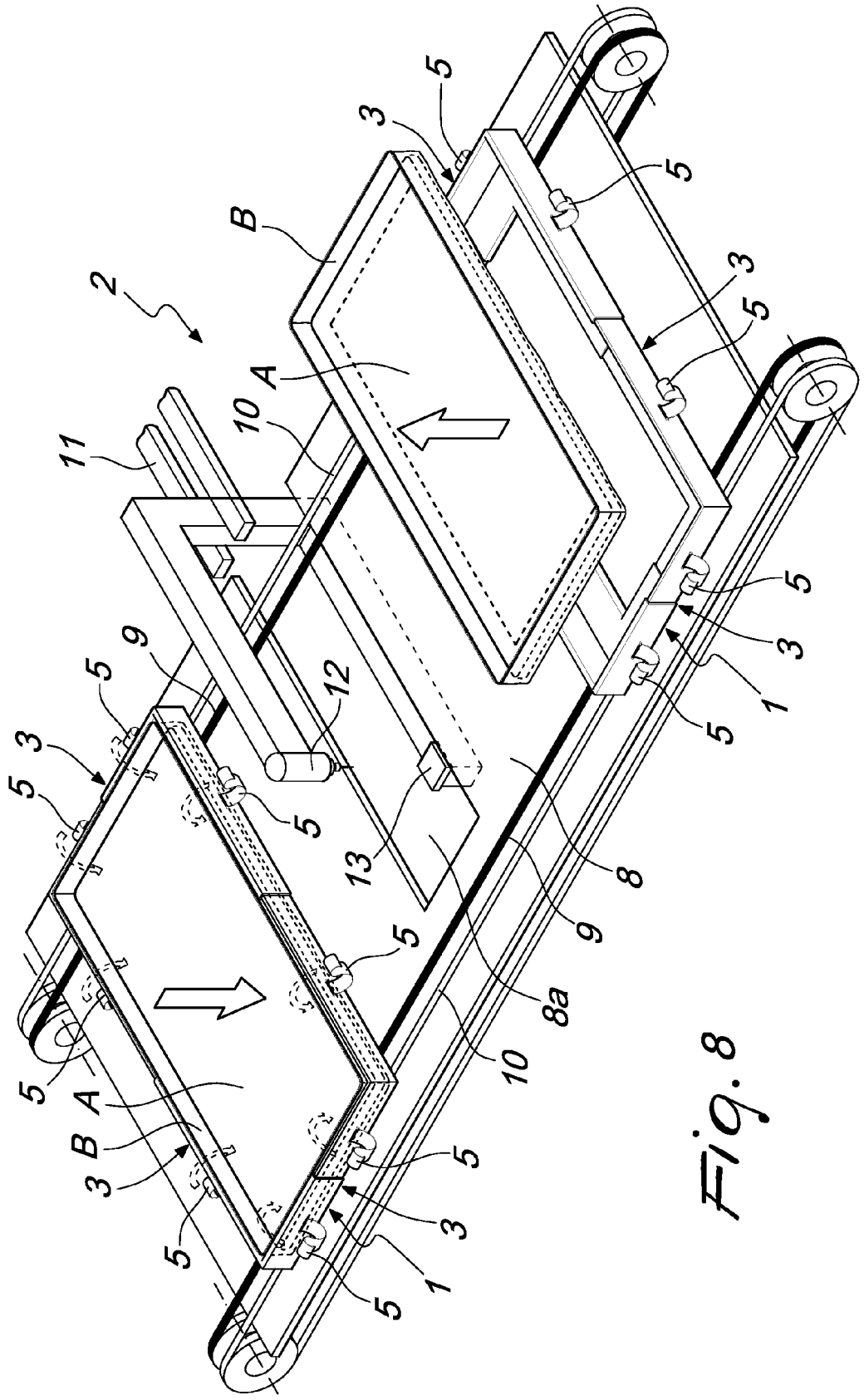

Fig. 8

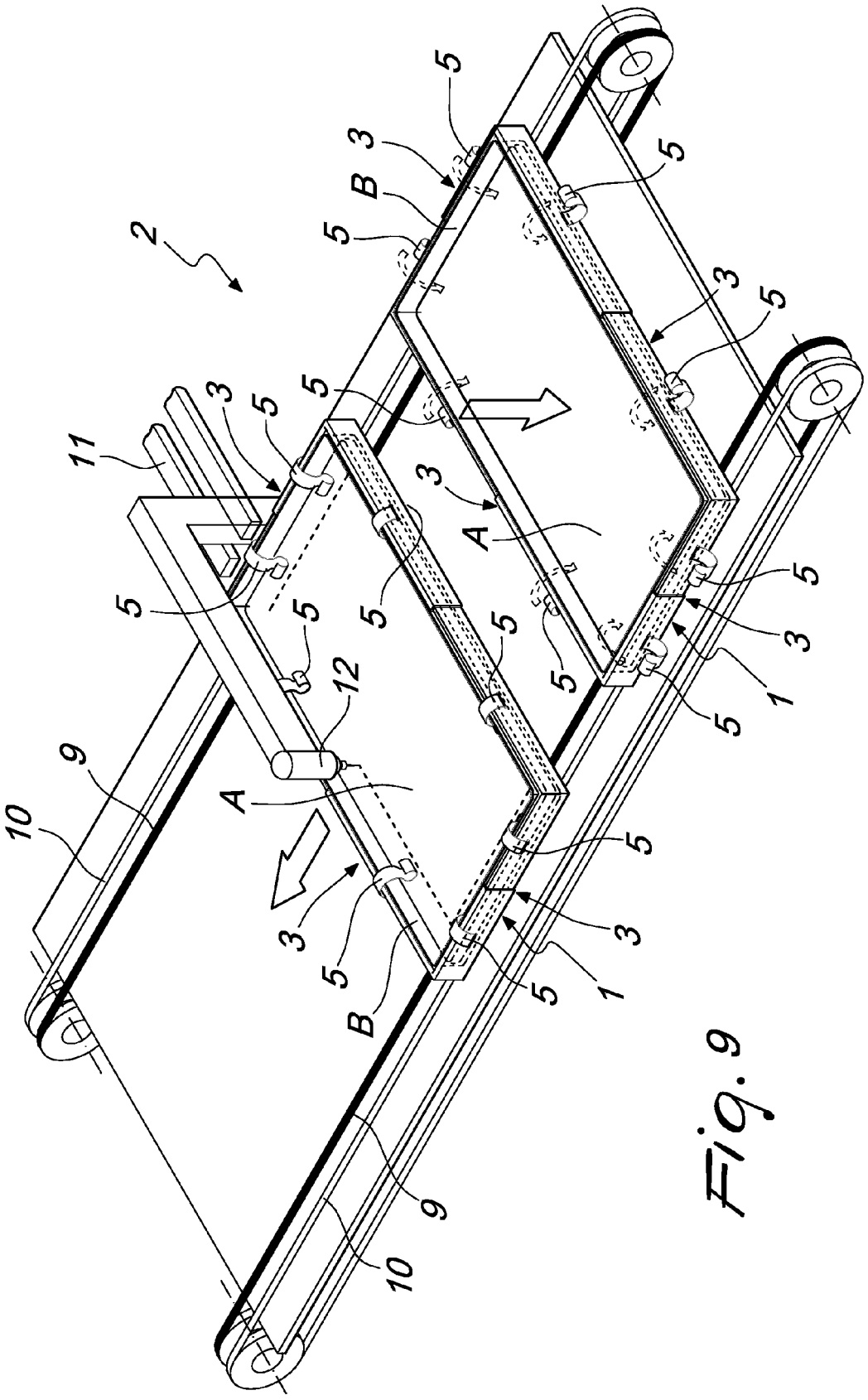

Fig. 9

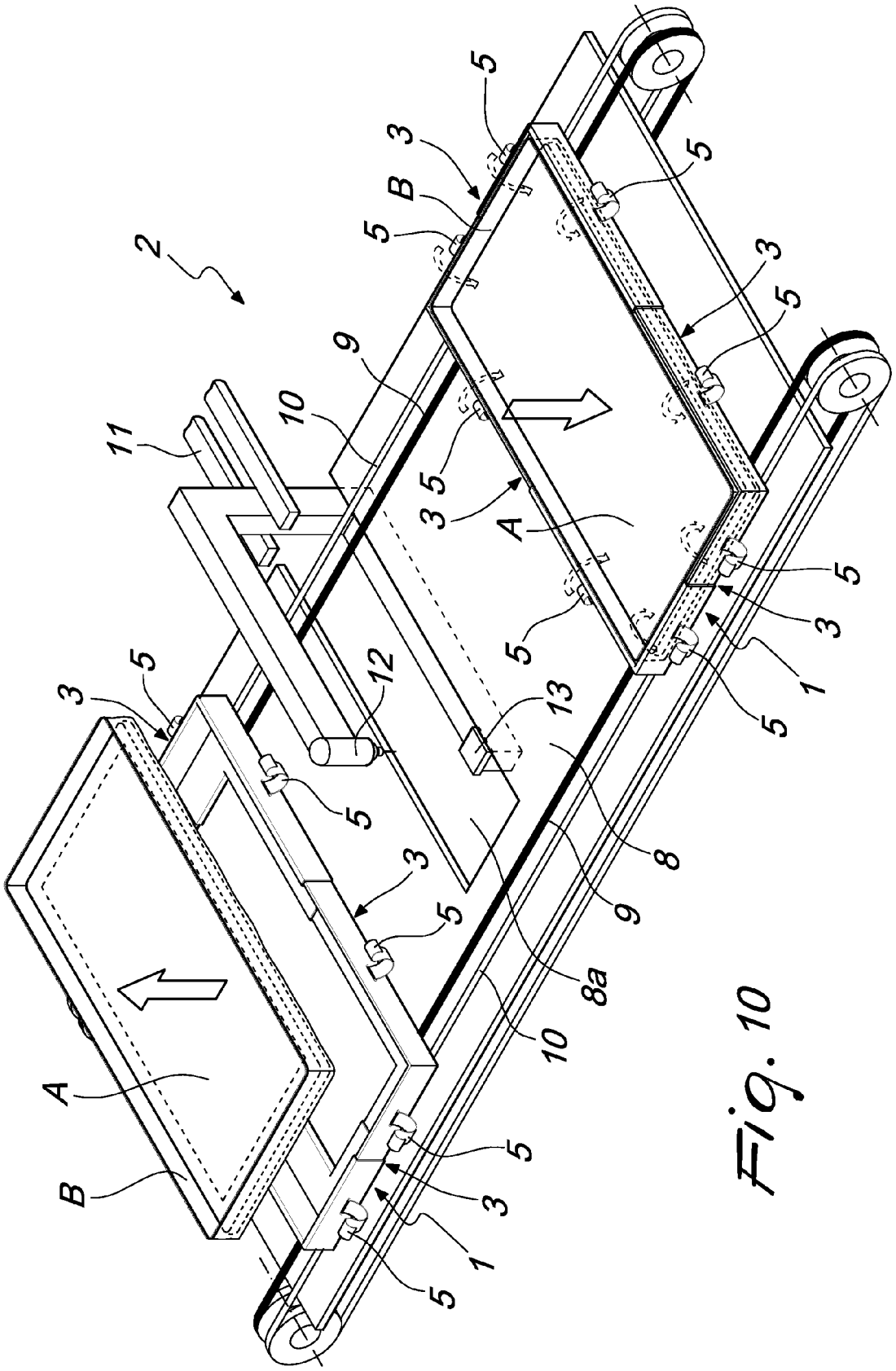

Fig. 10

Europäisches Patentamt
European Patent Office
Office européen des brevets

EUROPEAN SEARCH REPORT

Application Number
EP 14 15 7884

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 A	GB 2 143 860 A (ASHTON ROY PETER) 20 February 1985 (1985-02-20) * page 2, line 9 - page 3, line 23; figures 1-2 *	1-5 6-11	INV. D05B11/00 D05B39/00
A	US 3 441 994 A (WYLIE HAROLD B) 6 May 1969 (1969-05-06) * column 2, line 15 - column 3, line 11; figures 1-9 *	1-11	
A	WO 2005/113876 A2 (KOERNER RALPH J [US]) 1 December 2005 (2005-12-01) * paragraph [0024] - paragraph [0052]; figures 1-13 *	1-11	
A	DE 41 24 194 C1 (NÄHMASCHINENFABRIK EMIL STUTZNÄCKER GMBH) 3 December 1992 (1992-12-03) * column 2, line 11 - column 4, line 51; figures 1-8 *	1-11	
A	US 3 180 293 A (CASH DAVID R) 27 April 1965 (1965-04-27) * column 3, line 54 - column 12, line 49; figures 1-13 *	1-11	TECHNICAL FIELDS SEARCHED (IPC) D05B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	16 June 2014	Herry-Martin, D

CATEGORY OF CITED DOCUMENTS

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