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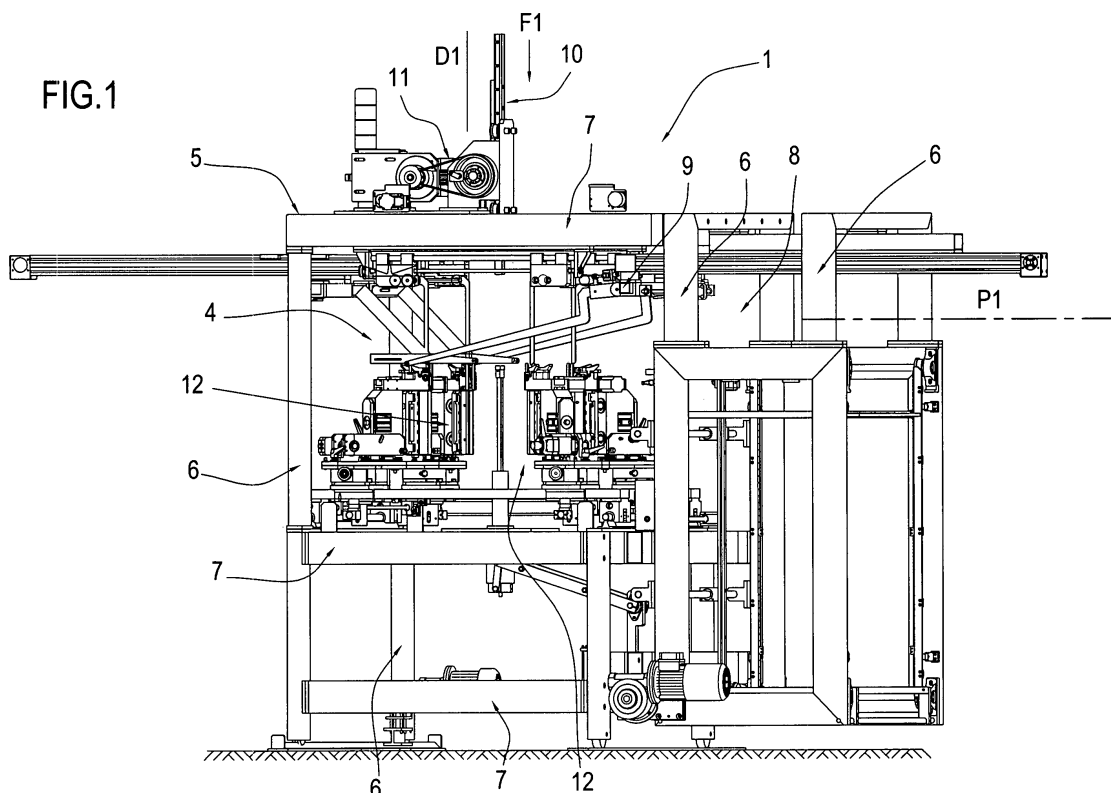
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(54) **A box erecting device**

(57) The device (4) for erecting boxes (2) from flat blanks (3) made of card comprises: a mandrel that moves vertically in a first defined vertical direction (D1); guides (55) for folding portions (3a) of the blank (3) in such a way as to shape the boxes (2), said folding guides (55) engaging the blank (3) when it comes into contact with the mandrel; a plurality of heads (12) for

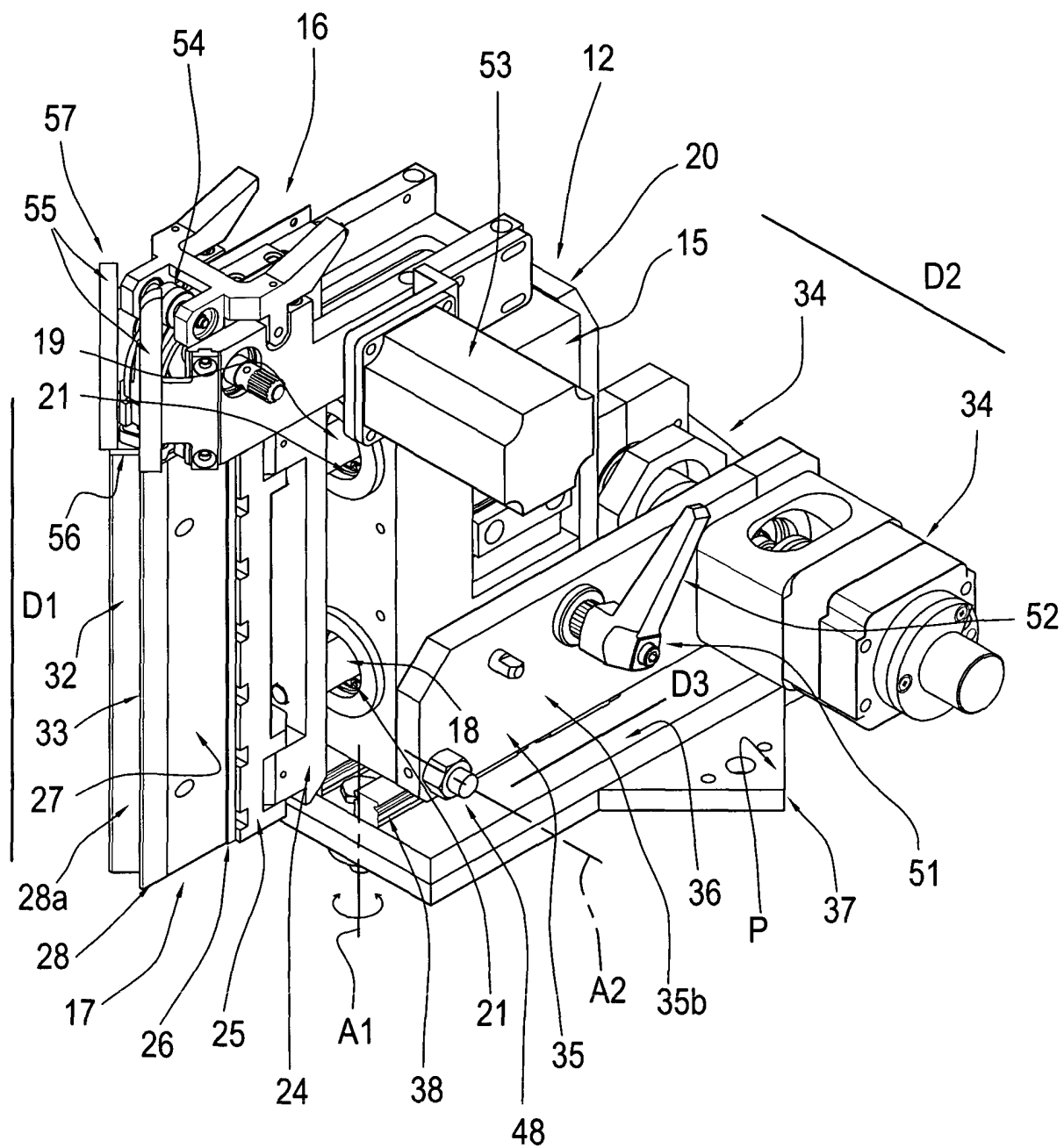
joining the corners (13) of the boxes (2) being erected, by applying lengths (14) of heat adhesive tape, each of the heads (12) comprising a device (16) for feeding the tape, a blade (56) for cutting the tape, a heating element (27) and a pressure shoe (28) over which the tape runs and which is designed to hold the tape length (14) in contact with the respective box (2) corner (13) to be connected.

FIG.1



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FIG.3



Description

[0001] The present invention relates to a box erecting device.

[0002] In particular, the present invention relates to a device for joining the vertical corners of boxes erected from flat blanks made of card.

[0003] In prior art, apparatus for erecting boxes normally comprises a magazine for the flat blanks, a station for picking up the blanks and feeding them to an erecting device where the blanks, moved by a vertical mandrel, are folded by contact with suitable folders along defined fold lines or creases in such a way as to form the side walls of the boxes.

[0004] A joining device, built into the erecting device connects the side walls by applying suitable joining elements consisting normally of lengths of heat adhesive tape.

[0005] For applying the lengths of adhesive tape, the joining device comprises a plurality of application heads located at the side corners of the boxes being erected.

[0006] The substantially erected box is then fed out and conveyed to other units for further processing such as, for example, for covering the box with a sheet of paper which improves its surface appearance and which may reproduce a company logo or the name of the end user of the box.

[0007] Prior art joining devices normally comprise four heads.

[0008] Each of the heads comprises a device for feeding the heat adhesive tape to a respective cutting element, a heating element and a pressure shoe over which the tape runs and which is designed to hold the tape in contact with the respective box corner to be connected.

[0009] The heating element keeps the temperature of the pressure shoe at a temperature high enough to thermally activate the heat adhesive tape so that the tape adheres effectively to the corners of the box.

[0010] The cutting element cuts the length of film required to join each corner.

[0011] The four heads can move in two directions, perpendicular to each other, so that they can adapt to the possible different sizes of the boxes to be made, with square or rectangular base.

[0012] The heads are therefore arranged diagonally, inclined by 45° with respect to the two perpendicular directions.

[0013] The demand for boxes with fancy shapes, not necessarily square or rectangular, has recently increased considerably.

[0014] Prior art erecting machinery, however, has the disadvantage of not permitting the taping heads to be effectively adapted to suit boxes of different shapes.

[0015] The aim of this invention is to overcome the above mentioned disadvantage through a box erecting device adapted to make boxes of different shapes and sizes and that is easy and practical to use.

[0016] The technical characteristics of the invention, with reference to the above aim, can be easily inferred from the appended claims, in particular claim 1, and also from any of the claims that depend, whether directly or indirectly, on claim 1. The advantages of the invention are apparent from the detailed description which follows, with reference to the accompanying drawings which illustrate preferred embodiments of the invention provided merely by way of example and without restricting the scope of the inventive concept, and in which:

- Figure 1 is a front perspective view of a preferred embodiment of a box erecting apparatus comprising an erecting device according to the present invention;
- Figure 2 is a schematic top plan view of the apparatus of Figure 1;
- Figure 3 is a perspective view from above of a detail of the device according to the invention;
- Figure 4 is a schematic side elevation of the detail of Figure 3;
- Figure 5 is a perspective view from above, from a different angle and with some parts cut away, of the detail of Figure 3;
- Figures 6 and 7 are schematic top plan views with some parts cut away, showing two different types of box that can be made using the device according to the present invention;
- Figure 8 is a perspective view from above, with some parts cut away for clarity, of a detail of the device illustrated in the drawings listed above;
- Figure 9 is a perspective view from above, with some parts cut away for clarity, of a detail of the device illustrated in the drawings listed above;
- Figure 10 is a top plan view of a flat blank from which a box is erected according to the present invention;
- Figure 11 is a perspective view from above of a box erected from the blank of Figure 10;
- Figure 12 is a perspective view from above of a box, differing in shape from that of Figure 11, made using the device according to the present invention;
- Figure 13 is a perspective view from above of a box, with yet another shape, made using the device according to the present invention.

[0017] With reference to Figure 1, the reference numeral 1 denotes in its entirety an apparatus for erecting boxes 2 from flat blanks 3 made of card.

[0018] The apparatus 1 comprises a box 2 erecting device 4 made in accordance with this invention.

[0019] The boxes 2, an example of which is illustrated in Figure 11, are made by erecting flat card blanks 3 of the type shown in Figure 10.

[0020] The apparatus 1 comprises a supporting frame 5 consisting of a plurality of interconnected uprights 6 and crosspieces 7.

[0021] The apparatus 1 also comprises a station 8 for storing the flat blanks 3, and transporting means 9 for

feeding the blanks 3 from the station 8 to the erecting device 4.

[0022] As shown in Figure 1, the transporting means 9 feed the blanks 3 to the device 4 by advancing them along a substantially straight path P1.

[0023] The erecting device 4 folds portions 3a of the blanks 3 about respective fold lines L thereby shaping the boxes 2.

[0024] The erecting device 4 comprises a customary mandrel (not illustrated in detail in the accompanying drawings) positioned at the bottom end of a vertically reciprocating rod 10 driven in a first defined direction D1 by respective drive means 11.

[0025] The erecting device 4 also comprises a plurality of heads 12 designed to join the vertical corners 13 of the box 2 being erected by applying respective lengths 14 of heat adhesive tape.

[0026] As shown in Figures 3 and 4, each head 12 comprises a central body 15, a tape feeding unit 16 and a tape sealing unit 17.

[0027] The central body 15 has two parallel stems 18, 19, respectively lower and upper, on which the tape sealing unit 17 is mounted. The two stems 18, 19 extend along respective longitudinal axes S1, S2 and are connected by respective first, rear ends (not illustrated) to a vertical wall 20, whilst their respective second, front ends 18a, 19a support the sealing unit 17.

[0028] Each of the stems 18, 19 is slidably supported by two bushes (not illustrated) inserted in respective holes 21 made in the central body 15.

[0029] A linear actuator 22 is mounted on the central body 15 and has a mobile stem 23 connected to the above mentioned vertical wall 20.

[0030] The sealing unit 17 comprises a supporting element 24 fixed to the two stems 18, 19, a first insulating element 25, a second insulating element 26, a heating element 27 and a pressure shoe 28.

[0031] The first insulating element 25 is pivoted on the supporting element 24 at two respective pins 29, 30, represented by dashed lines in Figure 4, which have the same pivot axis F.

[0032] The heating element 27 comprises an electric resistor (not illustrated) connected to a source of electrical power (also not illustrated) which heats the element 27. The above mentioned pressure shoe 28 is detachably connected to the heating element 27, heat being transmitted to the element 27 by conduction.

[0033] The pressure shoe 28 is detachably connected to the heating element 27 by customary fastening elements such as, for example, a plurality of screws 31.

[0034] The pressure shoe 28, whose operation is described in detail below, has a front section 28a consisting of two substantially planar faces 32, 33 at a defined angle to each other.

[0035] The head 12 is connected at the bottom to a respective mounting unit 34 which comprises a main body 35, a first, upper plate 36 and a second, lower plate 37.

[0036] As illustrated in Figure 3, the lower plate 37 defines a plane P perpendicular to the direction D1. A straight line lying in the plane P defines a second direction D2 described in more detail below. The upper plate 36 has fixed to it two straight rails 38 extending lengthways parallel to a third direction D3 perpendicular to the first, vertical direction D1.

[0037] The direction D2 is perpendicular both to the direction D1 and to the direction D3.

[0038] The main body 35 is slidably connected to the upper plate 36 by means of the two straight rails 38 on each of which there are engaged two carriages 39, advantageously of the recirculating ball type, said carriages being fixed to a base 40 at the bottom of the main body 35 itself.

[0039] With reference to Figure 5, the main body 35 has fixed to it an actuator 41 from which there protrudes a shaft 42 that revolves about a respective axis of rotation R.

[0040] Keyed to the shaft 42 there is an eccentric element 43 that is engaged inside a substantially oval hole 44 made in a third plate 44a fixed to the first, upper plate 36 and extending vertically from the latter.

[0041] As illustrated in Figures 4 and 5, the first, upper plate 36 is pivoted, by means of a pin 36a, on the second, lower plate 37 with respect to which it oscillates about a first oscillating axis A1 which is substantially vertical and parallel to the above mentioned first direction D1 in which the mandrel rod 10 moves.

[0042] The upper plate 36 has a first slot 45 within which there engages a first clamping element 46 that also comprises an operating handle 47.

[0043] The slot 45 is designed to allow the upper plate 36 and the head 12 to oscillate with respect to the lower plate 37 through a predetermined angle about the first axis A1.

[0044] The first clamping element 46 is designed to lock the first, upper plate 36 and, hence, the head 12 attached to it, relative to the second, lower plate 37 at a predetermined angular position with respect to the first oscillating axis A1 of the head 12 itself.

[0045] With reference to Figures 3 and 4, the central body 15 of the head 12 is pivoted on the main body 35 of the supporting unit 34 at a pin 48 which defines a second oscillating axis A2 for the head 12 itself.

[0046] The second oscillating axis A2 is perpendicular to the third direction D3, said third direction D3 being in turn perpendicular to the first vertical direction D1.

[0047] As illustrated in Figures 3 to 5, each of the two lateral faces 35a, 35b of the main body 35 has respective slots 49 made in it, only one of which is shown.

[0048] The slots 49 are designed to allow the head 12 to oscillate with respect to the main body 35 of the unit 34 through a predetermined angle about the second axis A2.

[0049] With reference to Figure 4, a pin 50 attached to the central body 15 engages with one of the slots 49 (the one illustrated) whilst, as shown in Figure 3, a sec-

ond clamping element 51 engages with the other slot 49 (the one that is not illustrated) so as to lock the central body 15 of the head 12 relative to the main body 35 at a predetermined angular position with respect to the second oscillating axis A2 of the head 12 itself.

[0050] The second clamping element 51 comprises a respective operating handle 52.

[0051] As shown in Figures 3 and 4, the tape feed unit 16 is fixed to the central body 15 of the head 12 and comprises means 53 for activating the tape guide elements 54.

[0052] For clarity, the tape is not illustrated in Figures 3 and 4.

[0053] Advantageously, the activating means 53 consist of an electric motor that can be activated independently for each head 12.

[0054] The tape feed unit 16 is of substantially known type and is therefore not illustrated in further detail in this specification.

[0055] With reference to Figures 3 and 4, the tape feed unit 16 is equipped with a pair of folding guides 55 of substantially known type. The guides 55 are designed to engage the blank 3 in such a way as to fold the blank 3 portions 3a which form the respective vertical walls 2a of the erected box.

[0056] A tape cutting blade 56, shown in Figure 5 and partially in Figure 3, is fixed to the top of the pressure shoe 28 of the head 12.

[0057] The guides 55 constitute, for each head 12, respective means 57 for folding portions 3a of the blank 3.

[0058] As illustrated in Figures 8 and 9, the supporting units 34 are in turn supported by a unit 58 for moving and positioning the heads.

[0059] The head movement and positioning unit 58 comprises two mobile crosspieces 59 extending lengthways in a direction parallel to a direction D4 that is parallel to the straight path P1, as clearly illustrated also in Figure 2.

[0060] The two crosspieces 59 are fixed at opposite ends to respective carriages 60 which run on rails 61 in such a way that the crosspieces 59 can be driven by customary actuators (not further described) in a direction D5 perpendicular to the direction D4.

[0061] The unit 58 also comprises, on each crosspiece 59, two first slides 62 driven by actuating means (not illustrated in detail) along the crosspiece 59 itself in the direction D4.

[0062] The first slide 62 mounts a second slide 63 that moves relative to the first slide 62 in the direction D5.

[0063] A threaded control element 64 allows the first and the second slide 62, 63 to move relative to each other.

[0064] As clearly shown in Figure 9, the second, lower plate 37 of the supporting unit 34 is stably fixed to the second slide 63 by customary fastening means which are not illustrated.

[0065] During use, with reference to Figure 1, the first transporting means 9 pick up a first blank 3 from a stack

of blanks 3 (not illustrated) located in the storage station 8.

[0066] The blank 3 is advanced in a direction parallel to the straight path P1 by the transporting means 9 which release it at the erecting device 4.

[0067] Once the blank 3 has been securely positioned on supporting means that are not illustrated, the above mentioned mandrel (also not illustrated) is lowered in the first direction D1 as indicated by the arrow F1 in Figure 1. When the mandrel comes into contact with the blank 3, it continues moving down.

[0068] During the downward movement, the flat blank 3 portions 3a, shown in Figure 10, that will form the vertical walls 2a of the box 2 being erected, are folded about the lines L by contact with the above mentioned folding guides 55 located at the tops of the heads 12.

[0069] With reference to a single head 12, once the folding guides 55 have moved the portions 3a closer together to form a vertical corner 13 of the box 2, the corner 13, as the mandrel continues to move down in the direction indicated by the arrow F1, is positioned face to face with a respective pressure shoe 28.

[0070] More specifically, since the corner 13 is made by two portions of two different walls 2a of the box 2 being erected, each of the portions faces (in a manner that is not illustrated) a respective face 32, 33 of the pressure shoe 28.

[0071] In the meantime, in a substantially known manner and therefore not illustrated or described in detail, the tape feed unit 16 has placed a length 14 of heat adhesive tape between the corner 13 and the pressure shoe 28.

[0072] With reference to Figure 4, once this configuration has been reached, the mandrel stops moving down and the linear actuator 22 advances the sealing unit 17 in the direction indicated by the arrow F2.

[0073] Thus, a linear movement of the mobile stem 23 of the actuator 22 along its axis 23a parallel to the third direction D3 produces a corresponding relative movement, also in direction D3, between the sealing unit 17 and the central body 15.

[0074] The movement of the sealing unit 17 brings the pressure shoe 28, heated by the respective heating element 27, into contact with the tape length 14, in such a way as to transmit a quantity of heat which, combined with a suitable pressing action, causes the tape length 14 to adhere to the respective corner 13 of the box 2 being erected.

[0075] As the sealing unit 17 advances, the blade 56 at the top of the shoe 28, acting in conjunction with a counterblade attached to the tape feed unit 16, cuts a length 14 of tape from the continuous tape being fed by the unit 16 itself.

[0076] When each of the heads 12 has joined a respective corner 13 of the box 2, the linear actuator 22 withdraws the sealing unit 17 in the direction indicated by the arrow F3 in Figure 4, thus moving the pressure shoe 28 away from the length 14 of tape just sealed.

[0077] With reference to Figures 3 to 5, the actuator 41 is then activated and rotates the eccentric element 43 keyed to its shaft 42 through a predetermined angle in such a way as to cause the main body 35 to retract in the direction D3 indicated by the arrow F3 away from the first, upper plate 36 with which it is slidably engaged.

[0078] In other words, the head 12, which is supported by the main body 35, is also moved in the direction indicated by the arrow F3 away from the erected box 2.

[0079] Once the heads 12 have been moved away from the box 2, the box 2 can be fed out of the erecting device for further processing, if necessary.

[0080] Figure 6 shows, in a schematic top plan view, a box 2 with rectangular base being erected and portions of four respective heads 12 positioned in the vicinity of four respective corners 13 of the box 2.

[0081] Of the heads 12, only the pressure shoes 28 and the respective heating elements 27 to which they are detachably connected are shown.

[0082] The situation illustrated in Figure 6 is typical of prior art erecting devices, where the boxes 2 to be erected have square or rectangular bases and, therefore, the corners 13 are formed by vertical walls 2a that are at right angles to each other.

[0083] In this case, the two faces 32, 33 of the pressure shoe 28 are at right angles to each other.

[0084] Further, the heads 12 can advance and withdraw in respective directions D3 that make an angle of 45° with the aforementioned straight feed path P1 of the blank 3.

[0085] In other words, the direction D3 coincides with the bisector of the angle of the respective corner 13.

[0086] Figure 7 schematically illustrates a box 2 similar to that of Figure 6 but with trapezoidal base.

[0087] As may be clearly inferred from Figure 7, where the base is defined by a generic trapezium as an example of all possible trapeziums, the corners 13 are made by vertical walls 2a that make angles both greater than and less than 90°.

[0088] In the example of Figure 7, the two corners made by the wall 2a defining the minor base of the trapezium make respective angles of 108° and, therefore, the two faces 32, 33 of the pressure shoe 28 mounted on the respective heads 12 are positioned at an angle of 108° to each other.

[0089] The heads 12 relating to these angles can advance and withdraw in respective directions D3 that make an angle of 54° with the aforementioned straight feed path P1 of the blank 3.

[0090] In other words, the direction D3 coincides with the bisector of the angle of the respective corner 13.

[0091] On the other hand, the two corners 13 made by the wall 2a defining the major base of the trapezium shown in the example of Figure 7 make respective angles of 72° and, therefore, the two faces 32, 33 of the pressure shoe 28 mounted on the respective heads 12 are positioned at an angle of 72° to each other.

[0092] The heads 12 can advance and withdraw in re-

spective directions D3 that make an angle of 36° with the aforementioned straight feed path P1 of the blank 3.

[0093] In other words, the direction D3 coincides with the bisector of the angle of the respective corner 13.

5 [0094] Advantageously, according to the present invention, it is possible to vary the angle made by the direction D3 of each head 12 with the feed path P1 so as to adapt the movement of the heads 12 so that they can erect boxes 2 with bases having shapes other than the ordinary square or rectangular shapes.

10 [0095] To adapt the erecting device 4 to boxes 2 of different shapes, it is necessary not only to vary the direction D3 of each head 12, but also, obviously, to fit a pressure shoe 28 whose faces 32, 33 are positioned at the required angle to each other.

15 [0096] Advantageously, the pressure shoe 28 can be changed quickly and easily by simply undoing the screws 31. As clearly illustrated above, the angle made by the direction D3 with the path P1 can be changed by slackening the first clamping element 46 and then rotating the first, upper plate 36 relative to the second, lower plate 37 about the axis A1 through a certain angle. Once the required angle has been set, the clamping element 46 can be tightened again so as to fix the relative position between the plates 36 and 37.

20 [0097] The boxes 2 illustrated and described to here comprise corners 13 extending in substantially vertical directions parallel to the first direction D1.

25 [0098] Advantageously, according to the present invention, it is possible to vary the angle of the box 2 corner 13 with respect to the vertical so as to make boxes 2 that are approximately pyramidal in shape, like the one shown in Figure 12.

30 [0099] Production of boxes of this shape is possible because the head 12 can oscillate about the axis A2 parallel to the direction D2.

35 [0100] From the structural description set out above, it is clear that, to modify the angle of the head 12 and, more specifically, of the pressure shoe 28 designed to engage a respective corner 13, it is necessary to slacken the second clamping element 51 and rotate the central body 15 relative to the main body 35 about the axis A2 through a defined angle. Once the required angle has been set, the second clamping element 51 can be tightened again so as to fix the relative position between the bodies 15 and 35.

40 [0101] Figure 9 illustrates a position of the head 12 suitable for making boxes 2 with square or rectangular base. Indeed, the configuration illustrated is such that the direction D3 defined by the straight rails 38 makes an angle of 45° with the direction D4, that is to say, with the path P1. As illustrated in Figures 7, 8 and 9, the unit 58 for moving and positioning the heads 12, made according to the present invention, makes it possible to arrange the heads 12 in such a way that the projections, in the plane of Figure 7, of the axes A1 of the heads 12 define the vertices of a trapezium.

45 [0102] This arrangement, essential to make boxes

with bases having shapes other than rectangular or square shapes, can be obtained only thanks to the fact that the second slide 63 can move relative to the first slide 62.

[0103] A computerised control unit (not illustrated) governs the operation of all the mechanisms and components described.

[0104] Advantageously, moreover, the tape activating element 53 is governed by the aforementioned non-illustrated control unit independently for each head 12, thus making it possible to apply different tape lengths 14 to the different corners 13 of a single box 2.

[0105] This feature advantageously allows production of boxes 2 of the type illustrated in Figure 13 where one side wall 2a of the box 2 defines two corners 13 of different length.

[0106] Although this specification refers to heat adhesive tape, it will be understood that this invention can be used with any other type of adhesive tape, whether gummed or otherwise made, suitable for connecting the corners of the box, even if no heating elements but only pressure shoes are used.

[0107] It will be understood that the invention described, useful in many industrial applications, may be modified and adapted in several ways without thereby departing from the scope of the inventive concept and that all the details of the invention may be substituted by technically equivalent elements.

Claims

1. A device for erecting boxes (2), in particular from flat blanks (3) made of card, comprising:

- a mandrel that moves vertically in a first defined vertical direction (D1);
- means (57) for folding portions (3a) of the blank (3) in such a way as to shape the boxes (2), said folding means (57) engaging the blank (3) when it comes into contact with the mandrel;
- a plurality of heads (12) for joining the corners (13) of the boxes (2) being erected, by applying lengths (14) of heat adhesive tape, each of the heads (12) comprising a device (16) for feeding the tape, an element (56) for cutting the tape, a heating element (27) and a pressure shoe (28) over which the tape runs and which is designed to hold the tape length (14) in contact with the respective box (2) corner (13) to be connected; the device being **characterised in that** each of the heads (12) is designed to oscillate about at least one respective axis (A1, A2), said axis (A1, A2) being parallel to the first vertical direction (D1) or a second direction (D2) perpendicular to said first direction.

2. The device according to claim 1, **characterised in**

that each of the heads (12) is designed to oscillate about a respective axis (A1) parallel to the first vertical direction (D1).

3. The device according to claim 1, **characterised in that** each of the heads (12) is designed to oscillate about a respective axis (A2) parallel to the second direction (D2) perpendicular to the first vertical direction (D1).

4. The device according to claim 1, **characterised in that** each of the heads (12) is designed to oscillate about two respective axes (A1, A2), the first axis (A1) being parallel to the first vertical direction (D1) and the second axis (A2) being parallel to the second direction (D2) perpendicular to the first vertical direction (D1).

5. The device according to any of the foregoing claims from 1 to 4 **characterised in that** each of the heads (12) comprises clamping means (46, 51) for locking the head (12) at a defined angular position with respect to one of the axes (A1, A2).

6. The device according to any of the foregoing claims from 1 to 5, where the pressure shoe (28) has two substantially planar faces (32, 33) designed to press the length (14) of tape against a respective corner (13) of the box (2), the device being **characterised in that** the pressure shoe (28) is detachably connected to the head (12).

7. The device according to claim 6, **characterised in that** the pressure shoe (28) has two planar faces (32, 33) positioned at right angles to each other.

8. The device according to claim 6, **characterised in that** the pressure shoe (28) has two planar faces (32, 33) positioned at an angle greater than 90° to each other.

9. The device according to claim 6, **characterised in that** the pressure shoe (28) has two planar faces (32, 33) positioned at an angle less than 90° to each other.

10. The device according to any of the foregoing claims from 1 to 9, **characterised in that** the device (16) for feeding the heat adhesive tape comprises, for each head (12), respective activating means (53), the activating means (53) of each head (12) being independent of the activating means (53) of the other heads (12).

11. The device according to any of the foregoing claims from 1 to 10, **characterised in that** the folding means (57) comprise a pair of guides (55) fixed to the top of each of the heads (12), each of the guides

(55) being designed to engage a respective portion (3a) of the blank (3) while the boxes (2) are being erected.

12. The device according to any of the foregoing claims from 1 to 10, **characterised in that** the heads (12) are mobile in a plane that is perpendicular to the first vertical direction (D1), at least partly independently of each other.

13. The device according to claim 12, **characterised in that** the heads (12) are supported in pairs by respective crosspieces (59) that are mobile in a defined sliding direction (D5), a first and a second slide (62, 63) being positioned between each of the heads (12) and the respective crosspiece (59), said first slide (62) being slidably engaged on the crosspiece (59) so as to move in a direction (D4) perpendicular to the sliding direction (D5), and said second slide (63) being able to move relative to the first slide (62) in a direction parallel to the sliding direction (D5).

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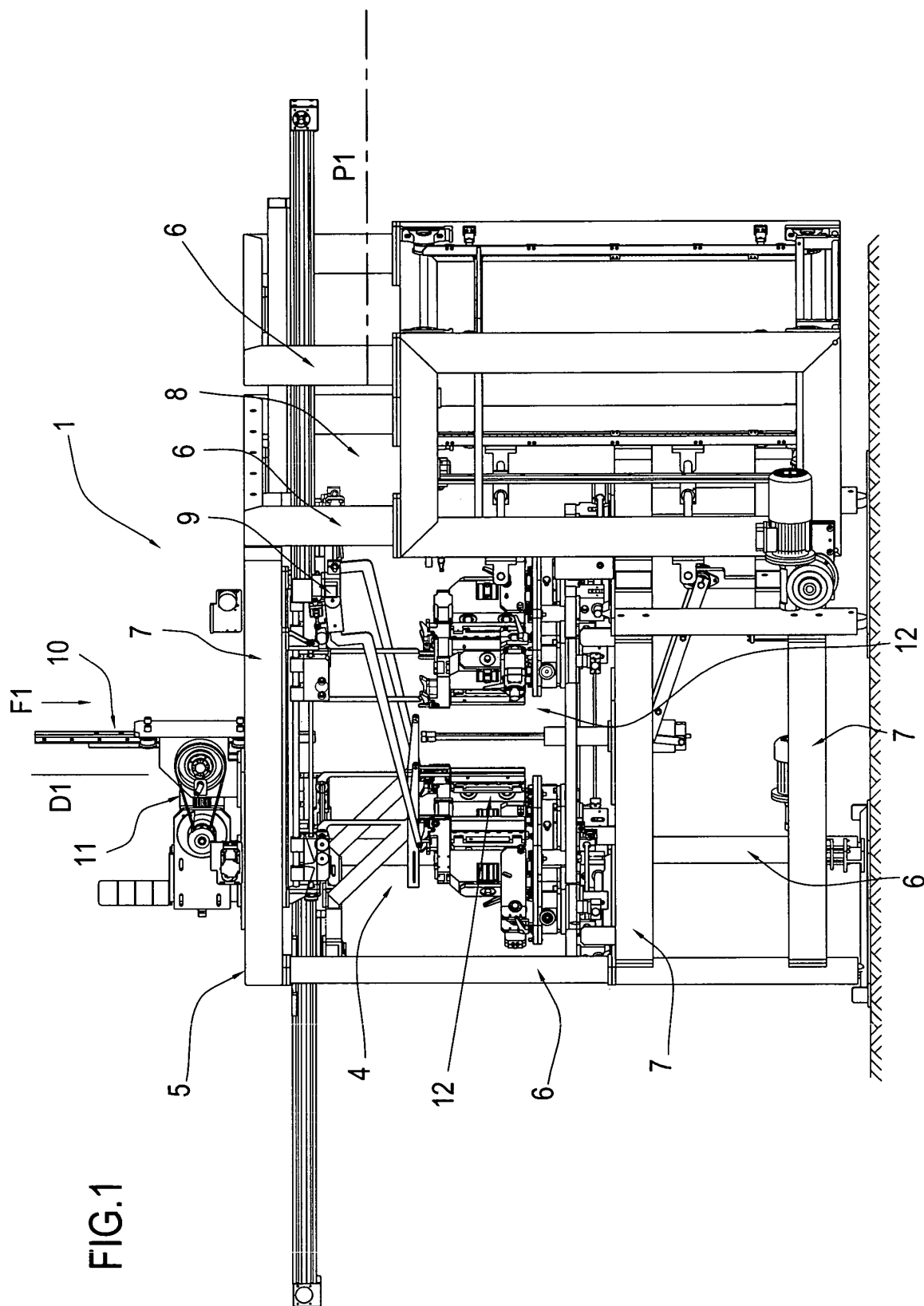


FIG.2

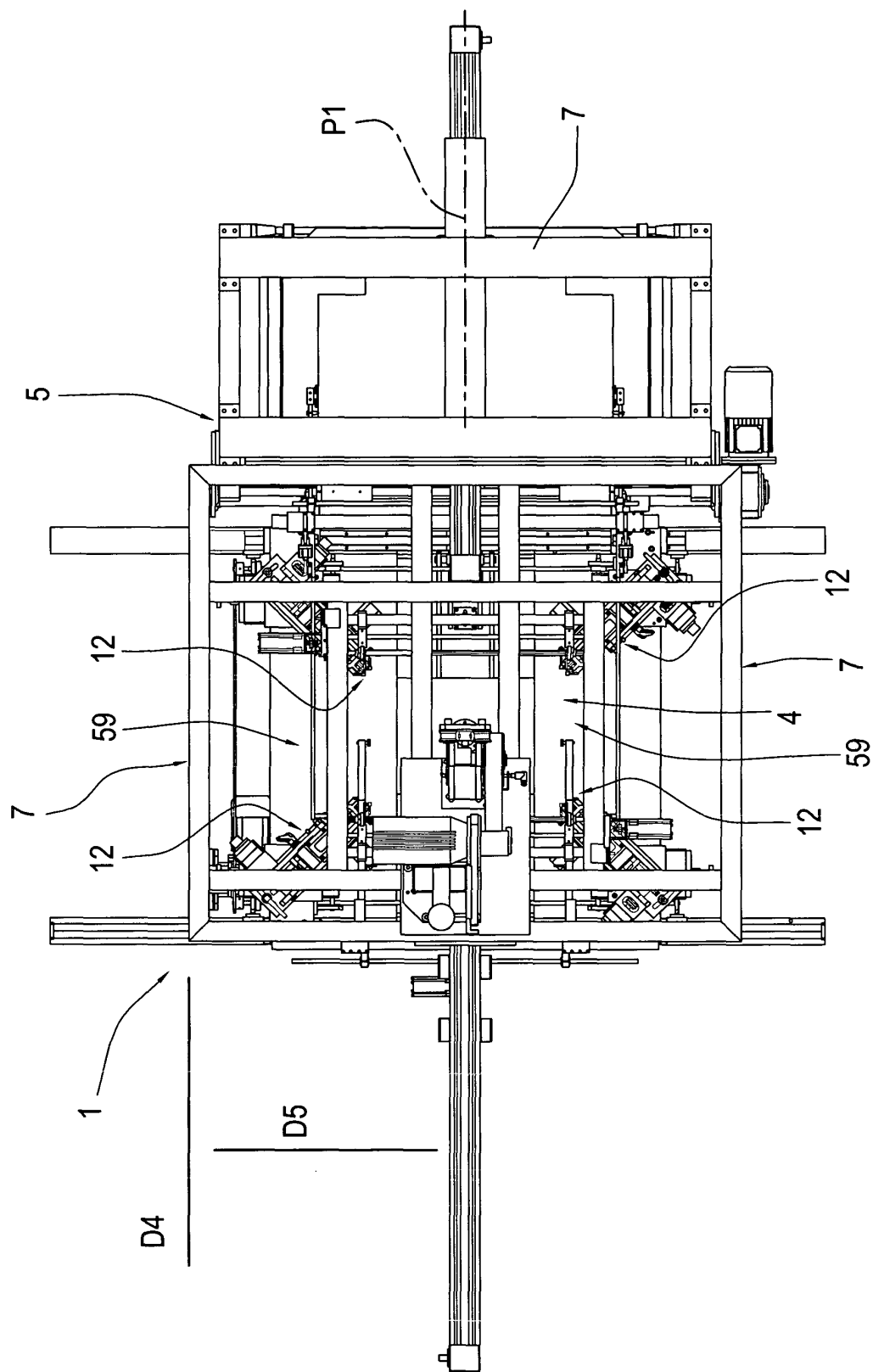


FIG.3

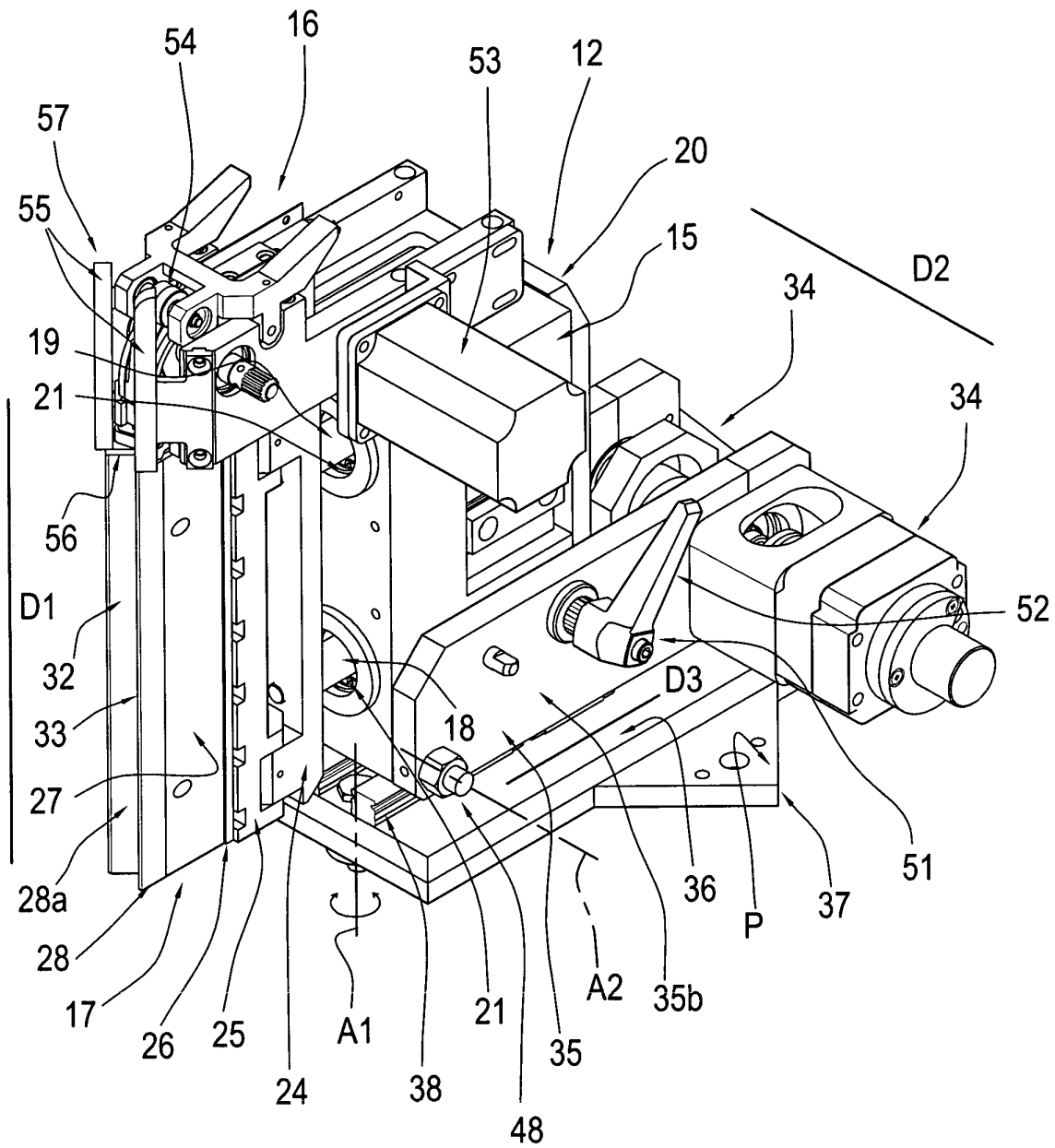


FIG.4

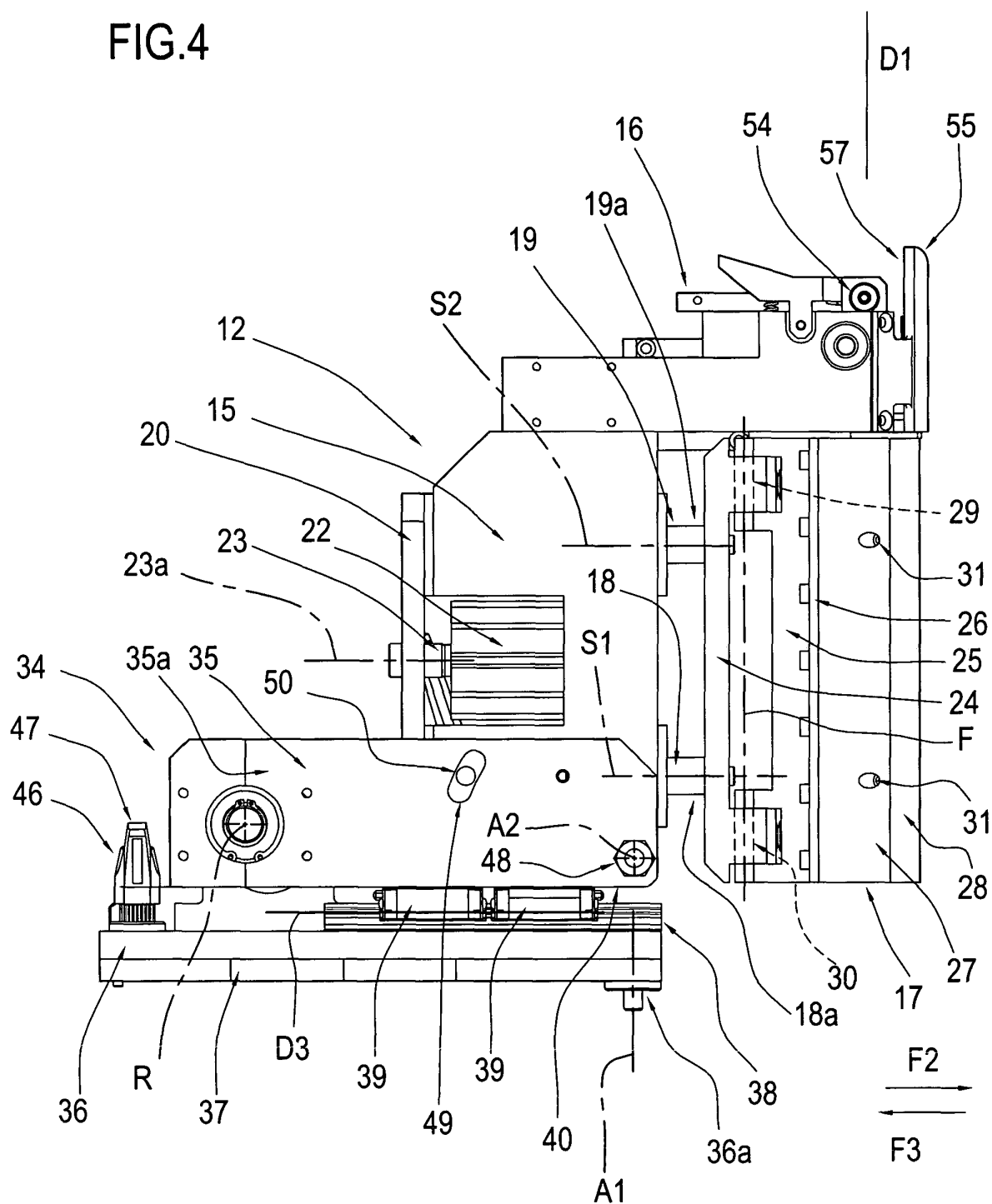
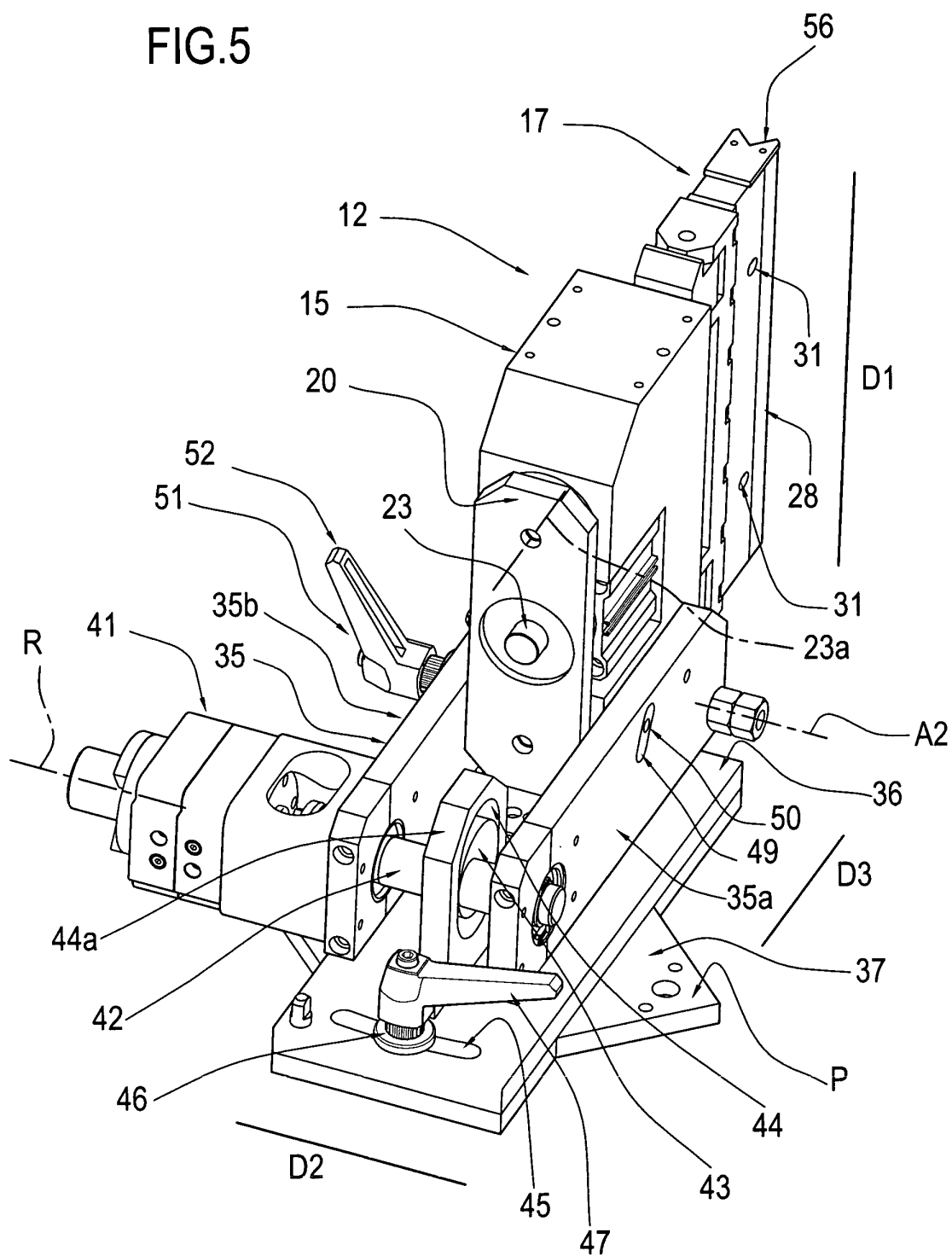
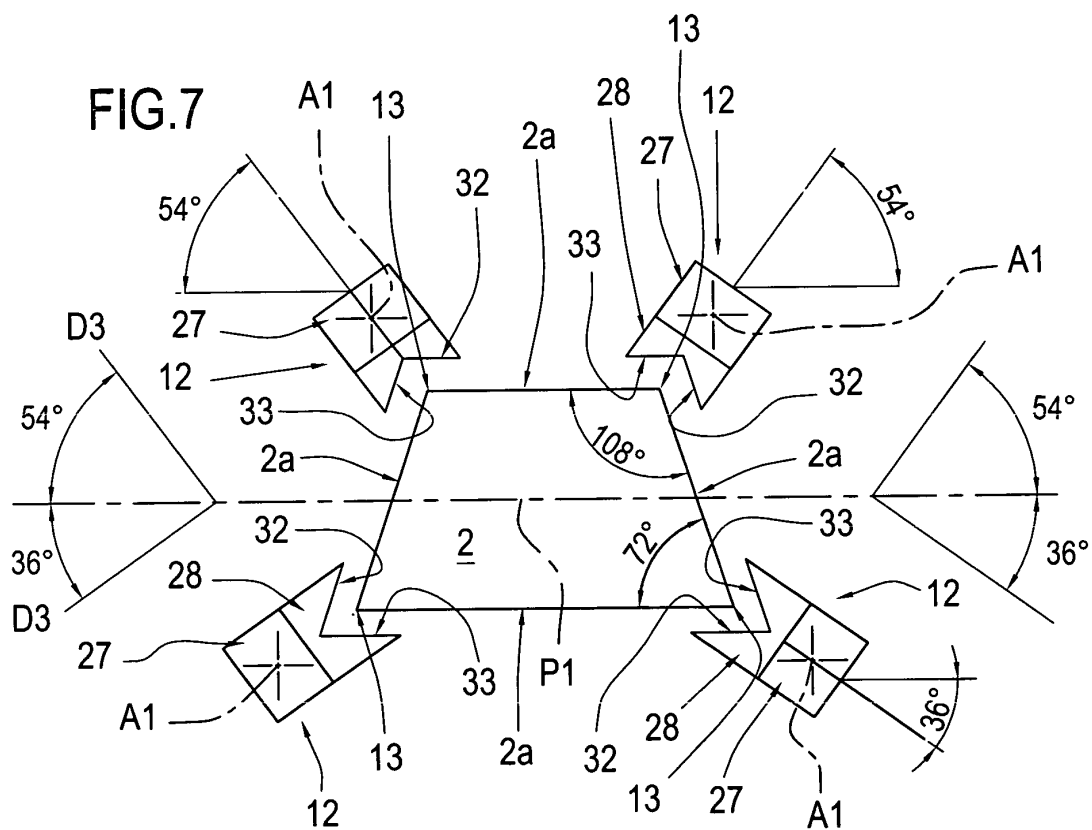
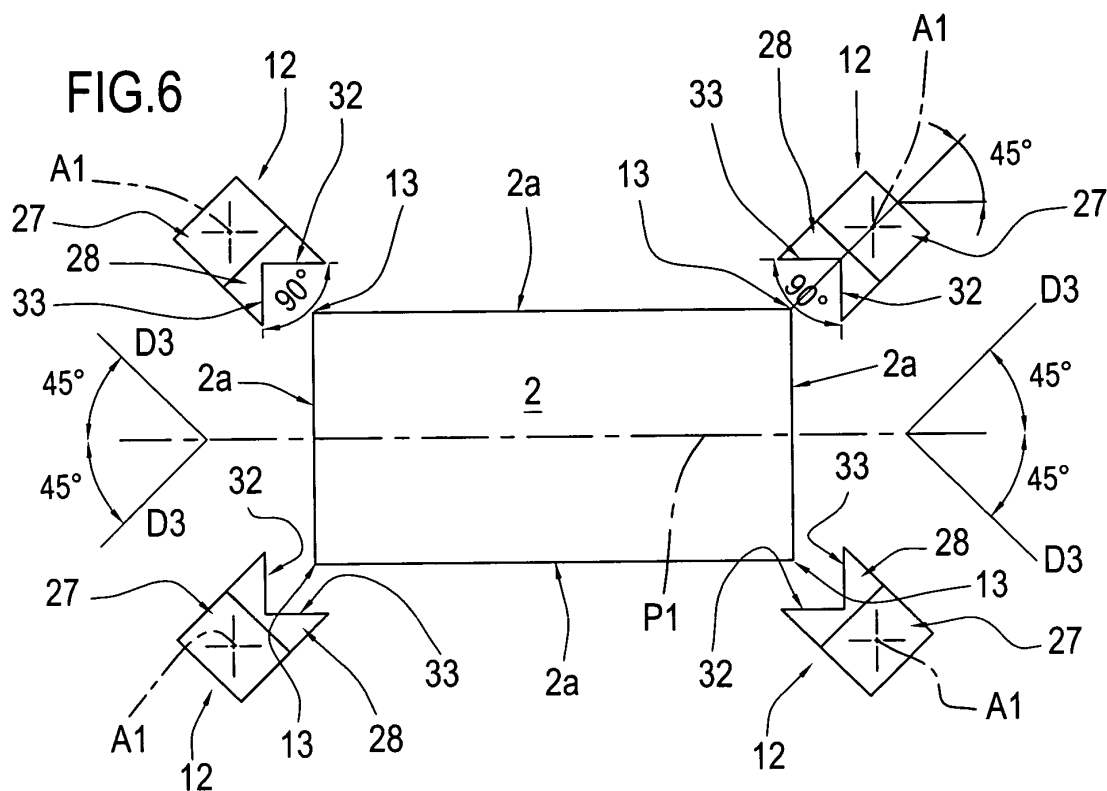
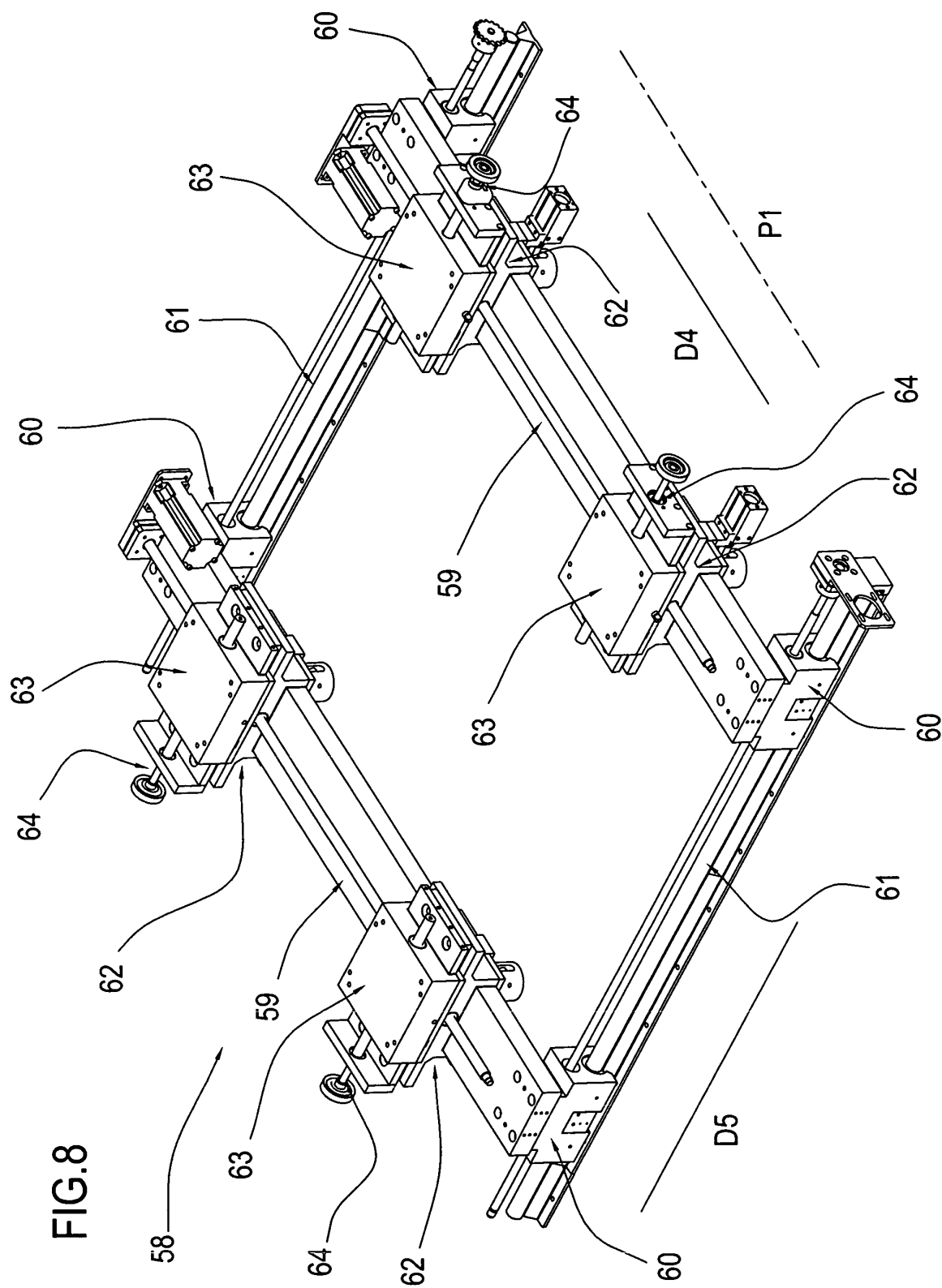


FIG.5







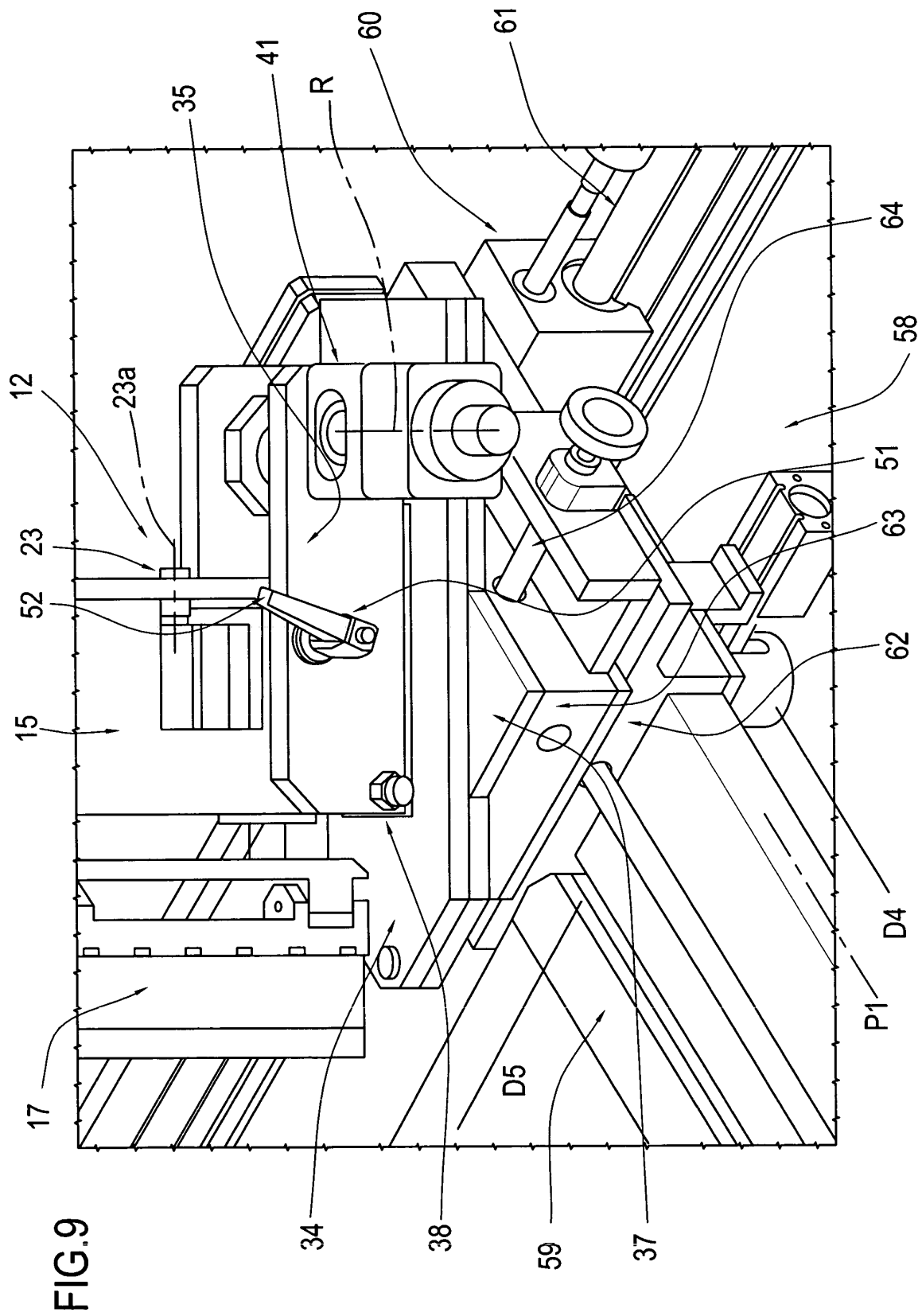


FIG.10

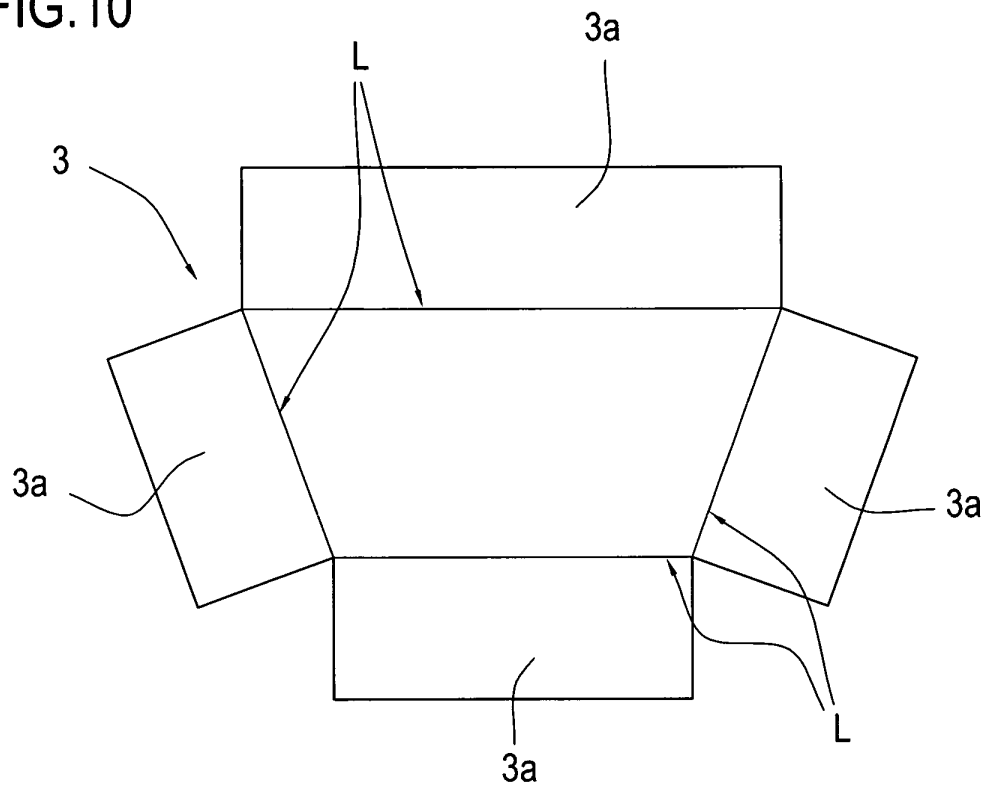


FIG.11

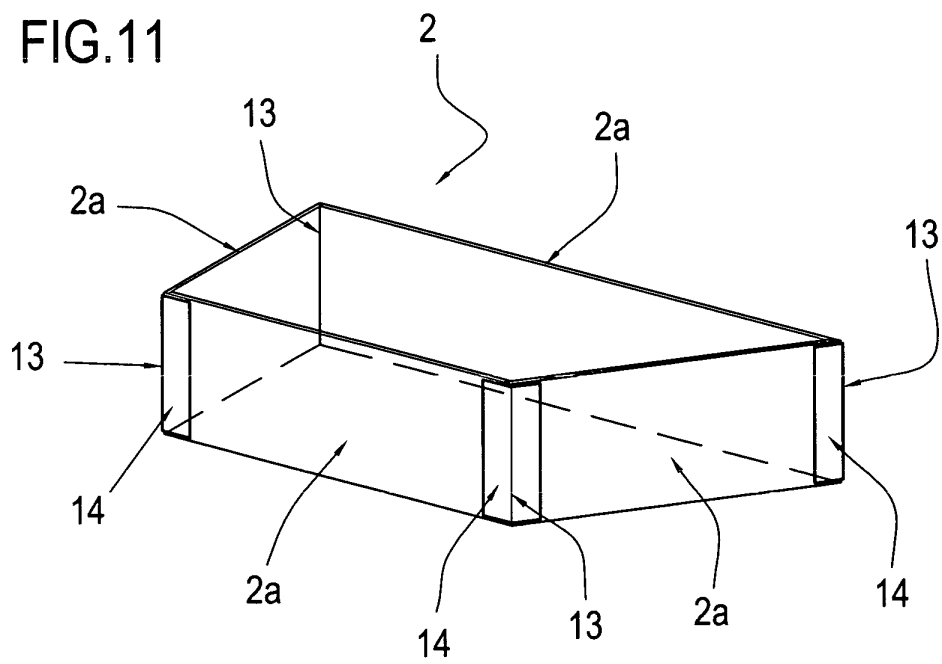


FIG.12

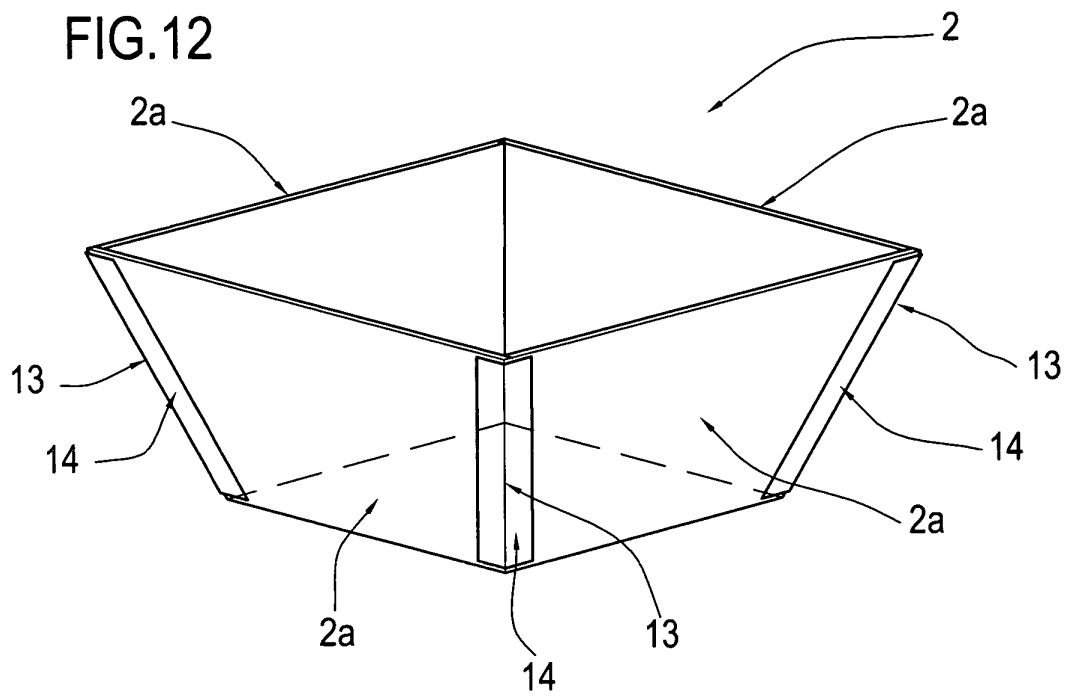
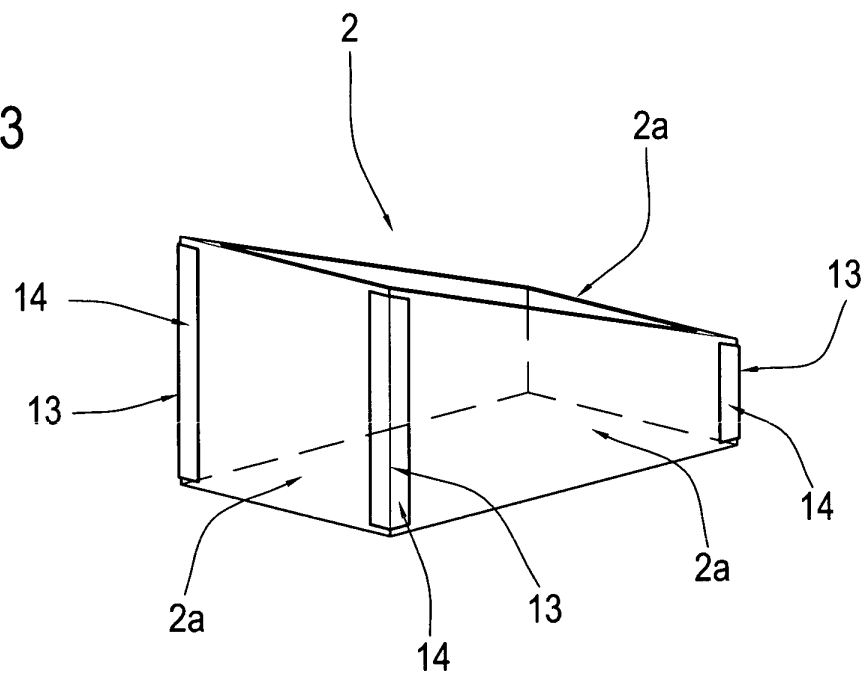


FIG.13





European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 05 42 5444

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			TECHNICAL FIELDS SEARCHED (Int.Cl.7)
			B31B B65D
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 13 September 2005	Examiner Johne, 0
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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13-09-2005

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