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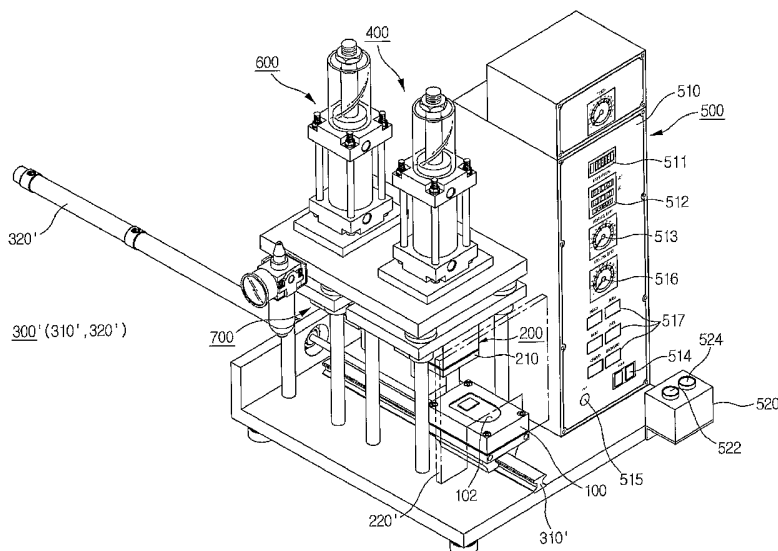
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ning of each regular issue of the PCT Gazette.

(54) Title: FUSION SPLICER



(57) Abstract: The object of this invention is to provide a fusion splicer, including a seating unit (100) to seat thereon objective materials to be fused, a heating unit (200) including a heating plate (210) to emit heat, a seating-unit feeder (300) to feed the seating unit along a predetermined course, a heating-plate feeder (400) to feed the heating plate, so that the heat of the heating plate is applied to the objective materials seated on the seating unit, when the seating unit is moved to a predetermined position, and a control unit (500) to control operation of the heating unit, the seating-unit feeder, and the heating-plate feeder. The fusion splicer prevents a worker from getting burned by heating rods, cools fused objective materials to shorten a working period, and automates a working process by controlling the fusing period and temperature.

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FUSION SPLICER

Technical Field

5 The present invention relates, in general, to fusion splicers to heat and splice objective materials and, more particularly, to a fusion splicer which allows objective materials to be fused to be easily seated in a predetermined position, and automatically performs thermal fusing and cooling processes.

Background Art

10 Fusion splicers heat and join two different objective materials, and have various designs and constructions according to materials and shapes of the objective materials to be widely used in various industrial fields.

15 The construction of a conventional fusion splicer will be described below with reference to the accompanying drawing.

 FIG. 1 shows the conventional fusion splicer to fuse plate-shaped objective materials.

20 In the conventional fusion splicer shown in FIG. 1, objects to be fused, that is, the plate-shaped objective materials, are seated on a working table 90, and a frame 10 is mounted to the working table 90, with movable elements being installed in the frame 10. An actuating cylinder 80 is installed at a central portion on an upper plate of the frame 10 to extend upwards from
25 the upper plate in a vertical direction. A piston rod 70 of the

cylinder 80 reciprocates vertically under the upper plate. An end of the piston rod 70 is coupled to a support unit 20, so that the support unit 20 reciprocates in conjunction with the reciprocating motion of the piston rod 70.

5 Further, four guide cylinders 81 are mounted on the upper plate to be positioned at vertices of a square defined by the upper plate while surrounding the actuating cylinder 80 located in the center. A through hole for each guide cylinder 81 is bored through the upper plate of the frame.

10 The support unit 20 includes a lower plate 21, an upper plate 22 which is installed above the lower plate 21 to be spaced apart from the lower plate 21 by a predetermined distance while being parallel to the lower plate 21, and side plates bent at both sides of the upper plate 22 to extend to the lower plate 21.
15 Further, the lower plate 21 has a rectangular shape, and guide rods 23 are provided on four corners of the lower plate 21 to extend upwards. Each of the guide rods 23 is inserted into an associated guide cylinder 81 to move along the guide cylinder 81, thus preventing the support unit 20 from vibrating during the movement
20 of the support unit 20. Further, the upper plate 22 is coupled to the lower end of the piston rod 70, so that the support unit 20 reciprocates in conjunction with the reciprocating motion of the piston rod 70.

25 Further, a base plate 30 is provided under the support unit 20, and a plurality of heating rods 51 to 56 are mounted to a lower portion of the base plate 30. The base plate 30 is heavy, to compress the objective materials to be fused. Further, a

cylindrical stopper 40 is screwed to the center of a lower portion of the support unit 20 to extend downwards in a vertical direction. In this case, a lower end of the stopper 40 is positioned below the lower ends of the heating rods 51 to 56. Since the stopper 40 is
5 screwed to the support unit 20, the length that the stopper 40 extends downwards can be adjusted. The stopper 40 compresses the plate-shaped objective materials during the fusing process, and causes the plate-shaped objective materials to be precisely joined together. Further, the base plate 30 is connected to the support
10 unit 20 through connection rods 31 and 32 that extend upwards from the upper surface of the base plate 30 in a vertical direction.

After a user places the objective materials to be fused on the working table 90, the piston rod 70 is moved downwards so that the heating rods 51 to 56 come into contact with the objective
15 materials. By heating the objective materials using the heating rods 51 to 56, the objective materials are thermally fused.

Such a conventional fusion splicer has a problem in that the position of the working table 90 is fixed under the heating rods 51 to 56, so that it is difficult to seat the objective materials on
20 the working table. The conventional fusion splicer has another problem in that the heating rods 51 to 56 are exposed to the outside, so that a worker may get burned when the heating rods 51 to 56 are heated.

Further, the conventional fusion splicer has a further
25 problem in that the splicer is not provided with a cooling unit to cool the fused objective materials, so that it is impossible to take the objective materials out of the splicer, until after the

fusing process has completed and the objective materials cool off. Thereby, a long time is required to perform the fusing process.

Description of Drawings

FIG. 1 shows a conventional fusion splicer to fuse plate-shaped objective materials;

FIG. 2 is a perspective view of a fusion splicer, according to the present invention;

FIG. 3 is a perspective view of a heating plate included in the fusion splicer shown in FIG. 2;

FIG. 4 is a side view to show specified parts of the fusion splicer of FIG. 2;

FIG. 5 shows the state where a seating unit moves from a position of FIG. 4 to a position under the heating plate;

FIG. 6 shows the state where the heating plate moves downwards from the position of FIG. 5;

FIG. 7 is a perspective view of a fusion splicer having a cooling unit, according to the present invention;

FIG. 8 is a perspective view of a heating plate included in the fusion splicer shown in FIG. 7;

FIG. 9 is a perspective view of a cooling plate included in the fusion splicer shown in FIG. 7;

FIG. 10 is a side view to show specified parts of the fusion splicer of FIG. 7;

FIGS. 11 to 14 sequentially show processes where first and second objective materials are thermally fused and then cooled; and

FIG. 15 shows the state where the members of a plurality of

fusion splicers of FIG. 7 are combined with each other.

<Description of reference characters of important parts>

100: seating unit

102: seating recess

5 110: heat-activated tape

120: first objective material

130: second objective material

200: heating unit

210: heating plate

10 220: safety plate

300: seating-unit feeder

310: guide rail

320: actuating cylinder

400: heating-plate feeder

15 500: control unit

510: control panel

600: cooling-plate feeder

700: cooling unit

710: cooling plate

20 Disclosure

Technical Problem

Accordingly, the present invention has been made keeping in mind the above problems occurring in the prior art, and an object of the present invention is to provide a fusion splicer which prevents a worker from getting burned by heating rods, and cools

25

fused objective materials to shorten a working period, and automates a working process by controlling the fusing period and temperature.

Technical Solution

5 In order to accomplish the above object, the present invention provides a fusion splicer, including a seating unit to seat thereon objective materials to be fused; a heating unit including a heating plate to emit heat; a seating-unit feeder to feed the seating unit along a predetermined course; a heating-plate
10 feeder to feed the heating plate, so that the heat of the heating plate is applied to the objective materials seated on the seating unit, when the seating unit is moved to a predetermined position; and a control unit to control operation of the heating unit, the seating-unit feeder, and the heating-plate feeder.

15 The seating-unit feeder includes a guide rail coupled to the seating unit so that the seating unit slides along the guide rail, and guiding a moving direction of the seating unit to rectilinearly move the seating unit in a horizontal direction, and a seating-unit
20 actuating cylinder to move the seating unit in a horizontal direction along the guide rail; and the heating-plate feeder includes a heating-plate actuating cylinder to move the heating plate in a vertical direction so that the heating plate comes into close contact with or moves away from the objective materials seated on the seating unit.

25 The seating-unit actuating cylinder and the heating-unit actuating cylinder are actuated by compressed air, and the fusion

splicer further includes an air compressor to produce compressed air to actuate the seating-unit actuating cylinder and the heating-plate actuating cylinder.

5 The fusion splicer further includes a cooling unit to cool the fused objective materials by spraying compressed air, fed from the air compressor, onto the fused objective materials.

10 The cooling unit includes a cooling plate having one or more air spray holes each serving as an outlet of compressed air, each of the air spray holes being formed toward the objective materials; and the fusion splicer further includes a cooling-plate feeder to allow the cooling plate to approach or move away from the objective materials, when the fused objective materials are fed to a position other than the heating position.

15 The cooling-plate feeder includes a cooling-plate actuating cylinder to move the cooling plate in a vertical direction. The cooling-plate actuating cylinder is also operated by the compressed air of the air compressor.

Best Mode

20 A preferred embodiment of a fusion splicer according to the present invention will be described with reference to the accompanying drawings.

FIG. 2 is a perspective view of a fusion splicer, according to the present invention.

25 As shown in FIG. 2, the fusion splicer of this invention includes a seating unit 100 to seat thereon an objective material to be fused. A heating unit 200 includes a heating plate 210 to

emit heat, and a safety plate 220 to isolate the heating plate 210 from an exterior so that the heating plate 210 is not exposed to the exterior. A seating-unit feeder 300 includes a guide rail 310 and a seating-unit actuating cylinder 320. The guide rail 310 is coupled to the seating unit 100 so that the seating unit 100 slides along the guide rail 310, and guides a moving direction of the seating unit 100 so that the seating unit 100 moves forwards and backwards. The seating-unit actuating cylinder 320 moves the seating unit 100 along the guide rail 310. A heating-plate feeder 400 feeds the heating plate 210 so that the heating plate 210 comes into close contact with the objective material when the seating unit 100 is placed inside the safety plate 220. The fusion splicer also includes a control unit 500 to control the operation of the heating unit 200, the seating-unit feeder 300, and the heating-plate feeder 400.

A heating-plate actuating cylinder (not shown) is provided in the heating-plate feeder 400 to move the heating plate 210 vertically so that the heating plate 210 comes into close contact with, or moves away from, the objective material seated on the seating unit 100.

A concave seating recess 102 is provided on an upper surface of the seating unit 100, and seats a part of the objective material therein to fix the objective material in the seating unit 100, thus preventing unexpected movement of the objective material, when the objective material is seated on the seating unit 100. The seating recess 112 may have various shapes, corresponding to the shape of the objective material.

Further, a pneumatic cylinder driven by compressed air may be used as each of the seating-unit actuating cylinder 320 and the heating-plate actuating cylinder. Thus, the fusion splicer of this invention further includes an air compressor (not shown) which produces compressed air to be fed to the seating-unit actuating cylinder 320 and the heating-plate actuating cylinder.

Since the internal constructions and operations of the seating-unit actuating cylinder 320 and the heating-plate actuating cylinder adapted to the present invention remain the same as those of a conventional pneumatic cylinder, the seating-unit actuating cylinder 320 and the heating-plate actuating cylinder will not be described in detail herein.

Further, the safety plate 220 is provided in the heating unit 200 to isolate the heating plate 210 from the exterior so that the heating plate 210 is not exposed to the exterior. As such, the heating plate 210 is isolated from the exterior by the safety plate 220, thus preventing a worker from getting burned due to the heating plate 210 heated at a high temperature.

Further, the fusion splicer of this invention includes a pressure gauge 530 which measures the pressure of compressed air to determine whether the pressure of the compressed air fed to the seating-unit actuating cylinder 320 and the heating-plate actuating cylinder is maintained within an allowable pressure level or not.

On a front of an outer surface of the control unit 500 is provided a control panel 510 to control several parameters required for the thermal fusing process.

On the control panel 510 are provided a counter 511, a

temperature control plate 512, a heating timer 513, a power switch 514, and a fuse 515. The counter 511 counts the number of executed thermal fusing processes. The temperature control plate 512 controls the temperature of the heating plate 210. The heating
5 timer 513 controls the time to heat the objective material after the heating plate 210 comes into close contact with the objective material. The power switch 514 controls the power supply to the above-mentioned elements. The fuse 515 breaks power supplied to the elements when current is excessive.

10 FIG. 3 is a perspective view of the heating plate included in the fusion splicer shown in FIG. 2.

In FIG. 3, the heating plate 210 is turned upside down so that a lower surface thereof contacting the objective material faces upward. Further, protuberances and depressions are provided
15 on the lower surface of the heating plate 210 contacting the objective material to allow the heating plate 210 to contact the whole surface of the objective material. The shapes of the protuberances and depressions provided on the lower surface of the heating plate 210 may vary, according to the shape of the objective
20 material.

The lower surface of the heating plate 210 is in contact with the whole upper surface of the objective material, thus efficiently transmitting heat from the heating plate 210 to the objective material.

25 FIG. 4 is a side view to show specified parts of the fusion splicer of FIG. 2.

FIG. 4 shows the seating unit 100, the heating unit 200, the

seating-unit feeder 300, and the heating-plate feeder 400 to illustrate a process of thermally fusing a heat-activated tape 110 to a first objective material 120.

5 The heat-activated tape 110 adapted to this embodiment exists in the state of a film without adhesive properties at a normal temperature, but has superior adhesive force compared to double-sided tapes or common glues. Thus, the heat-activated tape 110 is widely used due to its superior adhesive force.

10 Further, the first objective material 120 is made of metal having high heat conductivity so that heat is transmitted from the heating plate 210 to the heat-activated tape 110. The first objective material 120 may be made of various materials, without being limited to specific metal.

15 The seating unit 100 is constructed so that it is coupled to the seating-unit actuating cylinder 320 to rectilinearly slide along the guide rail 310. The seating-unit actuating cylinder 320 is constructed to make the seating unit 100 be completely retracted into or drawn out of the safety plate 220.

20 The heating plate 210 is placed above the seating unit 100 when the seating unit 100 is completely retracted into the safety plate 220. Further, the heating plate 210 is constructed to be vertically movable by the heating-plate feeder 400 so that the heating plate 210 comes into close contact with the first objective material 120 seated on the seating unit 100.

25 When a worker desires to thermally fuse the heat-activated tape 110 to the first objective material 120, as shown in FIG. 4, the seating unit 100 is completely drawn out of the safety plate

220. Next, the heat-activated tape 110 and the first objective material 120 are sequentially seated in the seating recess 102 provided on the upper surface of the seating unit 100.

Since the heat-activated tape 110 and the first objective material 120 are seated in the seating recess 102 provided on the upper surface of the seating unit 100, the heat-activated tape 110 and the first objective material 120 are not moved forward, backward, leftward, or rightward, even when the seating unit 100 moves.

FIG. 5 shows the state where the seating unit moves from the position of FIG. 4 to a position under the heating plate.

When the seating-unit actuating cylinder 320 is actuated in the state of FIG. 4 so that the seating unit 100 is retracted into the safety plate 220, the seating unit 100 is placed under the heating plate 210, as shown in FIG. 5.

In this case, a moving distance of the seating unit 100 depends on a driving distance of the seating-unit actuating cylinder 320. Thus, the driving distance of the seating-unit actuating cylinder 320 adapted to the present invention is determined so that the seating unit 100 is positioned under the heating plate 210.

FIG. 6 shows the state where the heating plate moves downwards from the position of FIG. 5.

In the state of FIG. 5, the heating-plate feeder 400 is operated to move the heating plate 210 downwards. At this time, as shown in FIG. 6, the heating plate 210 comes into close contact with the first objective material 120, and then applies heat to the

first objective material 120.

The heat from the heating plate 210 is applied through the first objective material 120 to the heat-activated tape 110. Thereby, the heat-activated tape 110 is thermally fused to the first objective material 120.

When a predetermined time has passed since the heating plate 210 contacted the first objective material 120, the heating-plate feeder 400 moves the heating plate 210 upwards. When the upward movement of the heating plate 210 is completed, the seating-unit feeder 300 moves the seating unit 100 out of the safety plate 220.

Duration of contact between the heating plate 210 and the first objective material 120 is selected by a user. The control unit controls the operation of the heating-plate feeder 400, according to the duration selected by the user.

FIG. 7 is a perspective view of a fusion splicer having a cooling unit, according to the present invention

When the cooling unit is installed in the fusion splicer of FIG. 2, as shown in FIG. 7, the cooling unit 700 is installed in back of the heating unit 200 along the moving direction of the seating unit 100.

The fusion splicer having such a cooling unit 700 integrates a process of thermally fusing the objective materials with another process of cooling the thermally fused objective materials into a single process, thus shortening the required time. Generally, right after the thermal fusing process is finished, the fused objective materials are very hot. Thus, it is difficult to load and pack the fused objective materials right after the thermal

fusing process. However, when using the fusion splicer shown in FIG. 7, the cooling process is carried out immediately after the thermal fusing process is finished, so that it is possible to load and pack the fused objective materials within a short period after the thermal fusing process, thus shortening the required time.

The cooling unit 700 includes a cooling plate (shown in FIGS. 9 to 14). The cooling plate contacts the fused objective materials and sprays compressed air onto the fused objective materials, thus cooling the fused objective materials. A cooling-plate feeder 600 is provided at a position above the cooling plate to move the cooling plate downwards in a vertical direction.

Further, the means for guiding the seating unit 100 includes a two-stage guide rail 310' which is longer than the guide rail of FIG. 2, so that the objective materials seated on the seating unit 100 are moved sequentially under the heating plate 210 and the cooling plate. The means for feeding the seating unit 100 includes a two-stage actuating cylinder 320' which is operated at two stages so that the seating unit 100 is stopped at positions under the heating plate 210 and the cooling plate. The two-stage actuating cylinder 320' of this invention is obtained by placing a conventional two-stage actuating cylinder horizontally. Thus, internal construction and operation of the two-stage actuating cylinder will not be described in detail herein.

Further, a cooling timer 516 for displaying a cooling time and a manual control switch 517 for manually controlling the fusing process are additionally provided on the control panel 510, in addition to the several units shown in FIG. 2.

FIG. 8 is a perspective view of the heating plate included in the fusion splicer shown in FIG. 7.

In FIG. 8, the heating plate 210 is turned upside down so that a lower surface thereof contacting the objective material faces upwards. Further, protuberances and depressions are provided on the lower surface of the heating plate 210 contacting the objective material to allow the heating plate 210 to contact the whole surface of the objective material. The shapes of the protuberances and depressions provided on the lower surface of the heating plate 210 may vary, according to the shape of the objective material.

The general function of the heating plate 210 shown in FIG. 8 remains the same as that of the heating plate of FIG. 3.

FIG. 9 is a perspective view of the cooling plate included in the fusion splicer shown in FIG. 7.

In FIG. 9, the cooling plate 710 is also turned upside down so that a lower surface thereof contacting the objective material faces upwards. The lower surface contacting the objective material has the same shape as that of the heating plate 210 of FIG. 8.

Further, one or more air spray holes 712 are provided on a portion contacting the objective material to pass through the cooling plate 710, while communicating with an air hole in the air compressor.

In this case, the shape and number of the air spray holes 712 may vary according to the objective materials to be fused.

FIG. 10 is a side view to show the specified parts of the fusion splicer of FIG. 7.

FIG. 10 shows the seating unit 100, the heating unit 200, a two-stage seating-unit feeder 300', the heating-plate feeder 400, the cooling-plate feeder 600, and the cooling unit 700 to illustrate a process of thermally fusing a second objective material 130 to the first objective material 120 with the heat-activated tape 110.

When a worker desires to thermally fuse the second objective material 130 to the first objective material 120 with the heat-activated tape 110, as shown in FIG. 10, the seating unit 100 is completely drawn out of the safety plate 220. Thereafter, the first and second objective materials 120 and 130 are sequentially seated in the seating recess 102 provided on the upper surface of the seating unit 100.

Since the first and second objective materials 120 and 130 are seated in the seating recess 102 provided on the upper surface of the seating unit 100, the first and second objective materials 120 and 130 are not moved forward, backward, leftward, or rightward even when the seating unit 100 moves.

FIGS. 11 to 14 sequentially show processes where the first and second objective materials are thermally fused and then cooled.

When the first and second objective materials 120 and 130 have been seated on the seating unit 100, a user inputs an actuating signal into the fusion splicer. At this time, the two-stage actuating cylinder 320' moves the seating unit 100 under the heating plate 210, as shown in FIG. 11. When the movement of the seating unit 100 is completed, the heating-plate feeder 400 moves the heating plate 210 downwards so that the heating plate 210 comes

into close contact with the second objective material 130, as shown in FIG. 12. Thus, heat is applied to the second objective material 130.

When the heat is transmitted from the heating plate 210 through the second objective material 130 to the heat-activated tape 110, the heat-activated tape 110 exhibits an adhesive property due to the heat, thus being thermally fused to the second objective material 130. Through a process of thermally fusing the second objective material 130 to the heat-activated tape 110, the second objective material 130 is joined to the first objective material 120.

When the thermal fusing process between the heat-activated tape 110 and the second objective material 130 is completed, the heating plate 210 moves upwards, and the two-stage actuating cylinder 320' moves the seating unit 100 to a position under the cooling plate 710, as shown in FIG. 13.

In this case, since construction and operation of the cooling-plate feeder 600 for feeding the cooling plate 710 remain the same as those of the heating-plate feeder 400, the cooling-plate feeder 600 will not be described herein in detail.

When the movement of the seating unit 100 is completed, the cooling-plate feeder 600 moves the cooling plate 710 downwards so that the cooling plate 710 comes into close contact with the second objective material 130, as shown in FIG. 14.

When the cooling plate 710 comes into close contact with the second objective material 130, compressed air generated from the air compressor sprays through the air spray holes 712 formed in the

cooling plate 710 onto the objective materials, thus cooling the objective materials.

FIG. 15 shows the state where the members of a plurality of fusion splicers of FIG. 7 are combined with each other.

5 As shown in FIG. 15, when the members of a plurality of fusion splicers are combined with each other and the operating periods of the fusion splicers are set differently, one worker can control the plurality of fusion splicers at the same time, thus enhancing working efficiency.

10 According to this embodiment, two fusion splicers are combined with each other. However, the number of fusion splicers to be combined with each other may vary without being limited to a specific number.

15 Although the preferred embodiments of the present invention have been disclosed for illustrative purposes, those skilled in the art will appreciate that various modifications, additions and substitutions are possible, without departing from the scope and spirit of the invention as disclosed in the accompanying claims.

Industrial Applicability

20 As described above, the present invention provides a fusion splicer which prevents a worker from getting burned by heating rods, and cools fused objective materials to shorten a working period, and automates a working process by controlling the fusing period and temperature.

CLAIMS

1. A fusion splicer, comprising:

a seating unit (100) to seat thereon objective materials to be fused;

5 a heating unit (200) comprising a heating plate (210) to emit heat;

a seating-unit feeder (300) to feed the seating unit (100) along a predetermined course;

10 a heating-plate feeder (400) to feed the heating plate (210), so that the heat of the heating plate (210) is applied to the objective materials seated on the seating unit (100), when the seating unit (100) is moved to a predetermined position; and

a control unit (500) to control operation of the heating unit, the seating-unit feeder, and the heating-plate feeder.

15 2. The fusion splicer according to claim 1, wherein the seating-unit feeder (300) comprises:

20 a guide rail (310) coupled to the seating unit (100) so that the seating unit slides along the guide rail, and guiding a moving direction of the seating unit (100) to rectilinearly move the seating unit (100) in a horizontal direction; and

a seating-unit actuating cylinder (320) to move the seating unit (100) in a horizontal direction along the guide rail (310), and

the heating-plate feeder (400) comprises:

25 a heating-plate actuating cylinder to move the heating

plate (210) in a vertical direction so that the heating plate (210) comes into close contact with or moves away from the objective materials seated on the seating unit (100).

3. The fusion splicer according to claim 1 or 2, further comprising:

a safety plate (220) mounted to an outer surface of the heating plate (210) to isolate the heating plate (210) from an exterior.

4. The fusion splicer according to claim 1 or 2, wherein the seating-unit actuating cylinder and the heating-unit actuating cylinder each comprise a pneumatic cylinder to be actuated by compressed air, and

the fusion splicer further comprising:

an air compressor to produce compressed air to actuate the seating-unit actuating cylinder and the heating-plate actuating cylinder.

5. A fusion splicer, comprising:

a seating unit (100) to seat thereon objective materials to be fused;

a heating unit (200) comprising a heating plate (210) to emit heat;

a seating-unit feeder (300) to feed the seating unit (100) along a predetermined course;

a heating-plate feeder (400) to feed the heating plate

(210), so that the heat of the heating plate (210) is applied to the objective materials seated on the seating unit (100), when the seating unit (100) is moved to a predetermined position;

a control unit (500) to control operation of the heating unit, the seating-unit feeder, and the heating-plate feeder; and

a cooling unit (700) to cool the fused objective materials.

6. The fusion splicer according to claim 5, wherein the cooling unit (700) comprises:

a cooling plate (710) comprising one or more air spray holes (712) each serving as an outlet of compressed air, each of the air spray holes (712) being formed toward the objective materials, and

the fusion splicer further comprising:

a cooling-plate feeder (600) to allow the cooling plate (710) to approach or move away from the objective materials, when the fused objective materials are fed to a position other than the heating position.

7. The fusion splicer according to claim 5 or 6, wherein the seating-unit feeder (300) comprises:

a guide rail (310) coupled to the seating unit (100) so that the seating unit slides along the guide rail, and guiding a moving direction of the seating unit (100) to rectilinearly move the seating unit (100) in a horizontal direction; and

a seating-unit actuating cylinder (320) to move the seating unit (100) in a horizontal direction along the guide rail (310),

and

the heating-plate feeder (400) comprises:

5 a heating-plate actuating cylinder to move the heating plate (210) in a vertical direction so that the heating plate (210) comes into close contact with or moves away from the objective materials seated on the seating unit (100).

8. The fusion splicer according to claim 5 or 6, further comprising:

10 a safety plate (220) mounted to an outer surface of the heating plate (210) to isolate the heating plate (210) from an exterior.

9. The fusion splicer according to claim 5 or 6, wherein

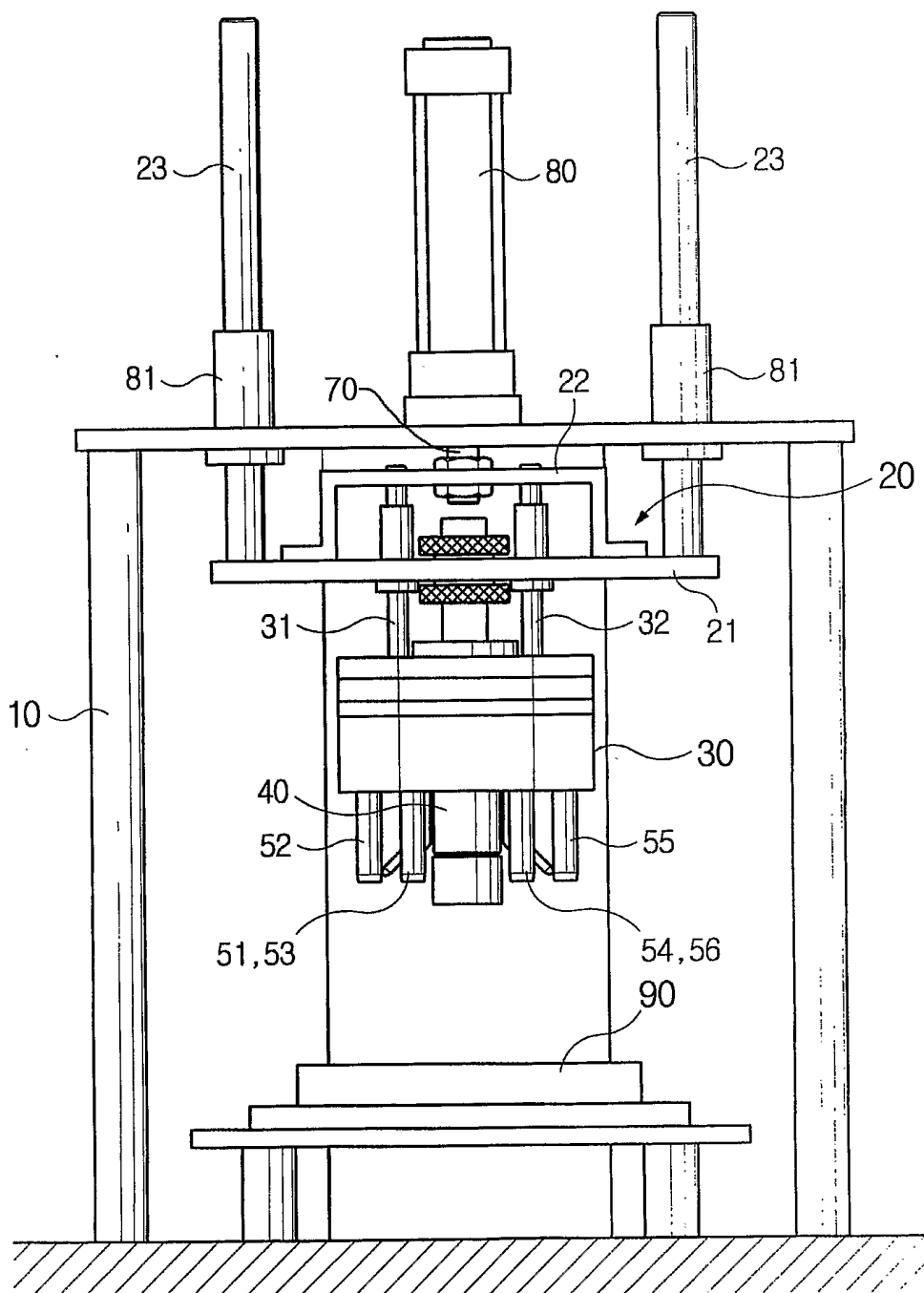
15 the seating-unit actuating cylinder and the heating-unit actuating cylinder each comprise a pneumatic cylinder to be actuated by compressed air, and

the fusion splicer further comprising:

an air compressor to produce compressed air to actuate the seating-unit actuating cylinder and the heating-plate actuating cylinder.

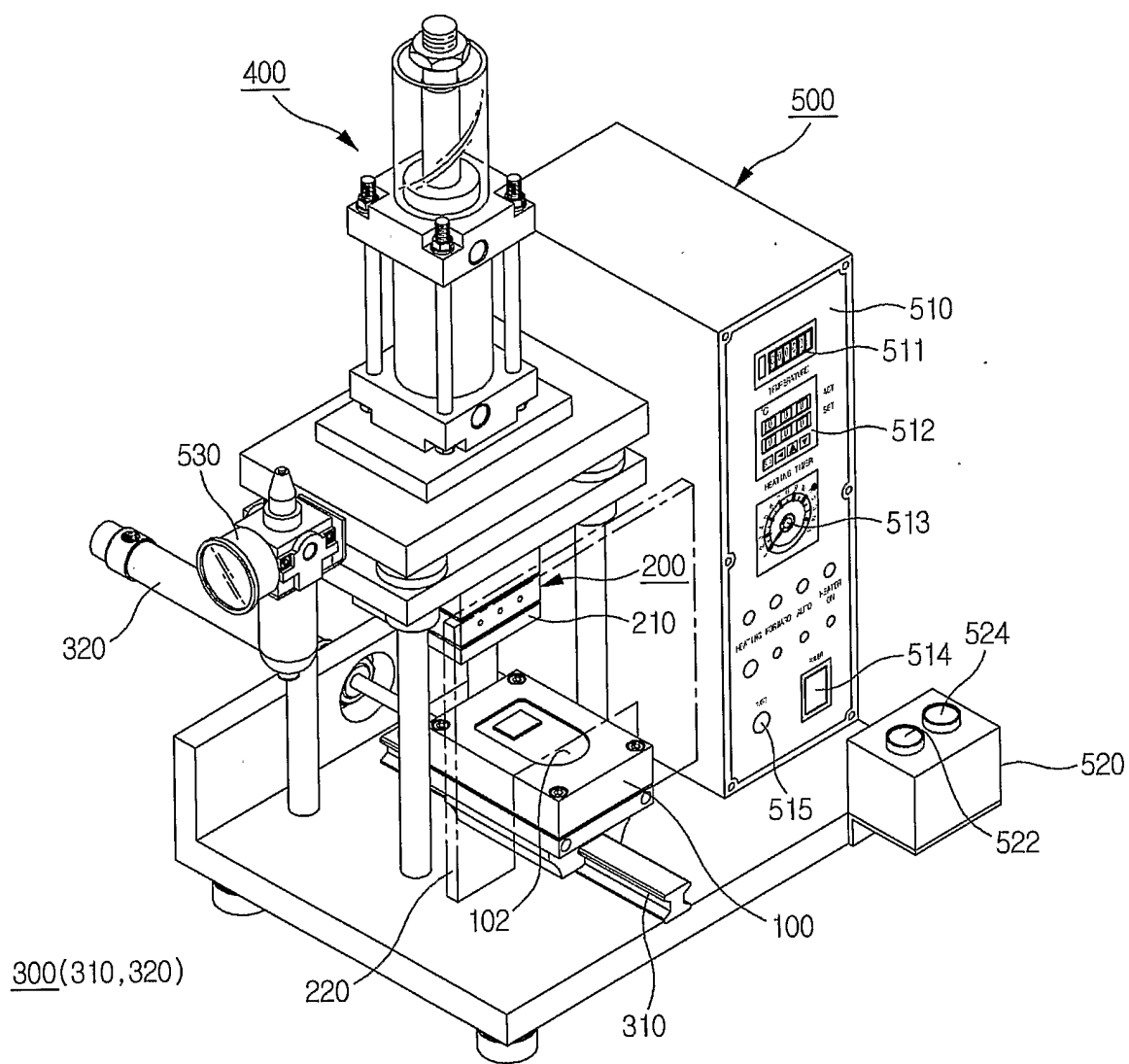
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[Fig. 1]



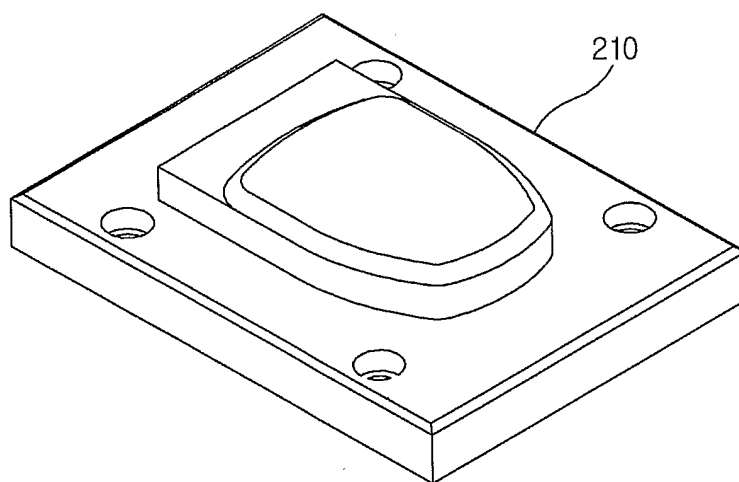
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[Fig. 2]

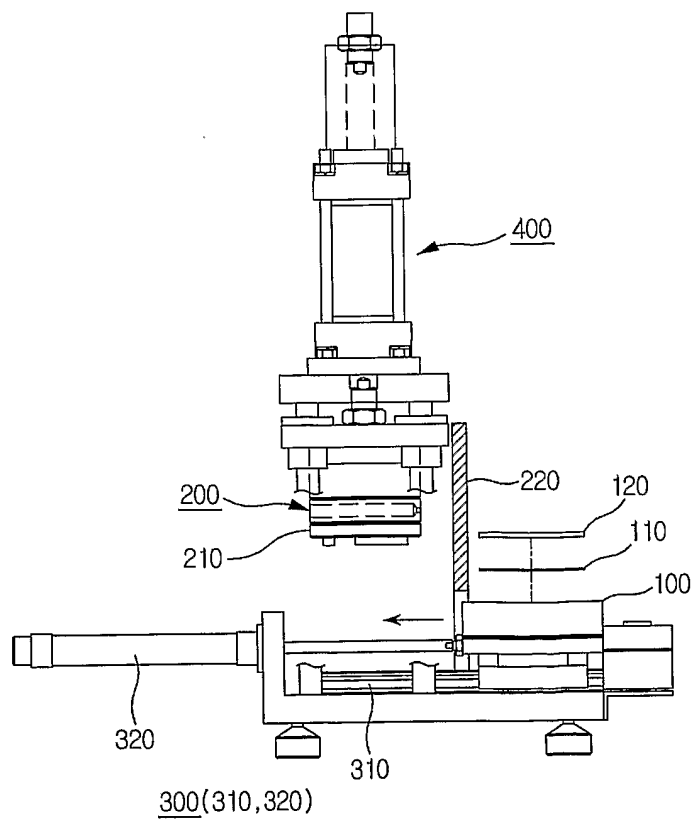


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[Fig. 3]

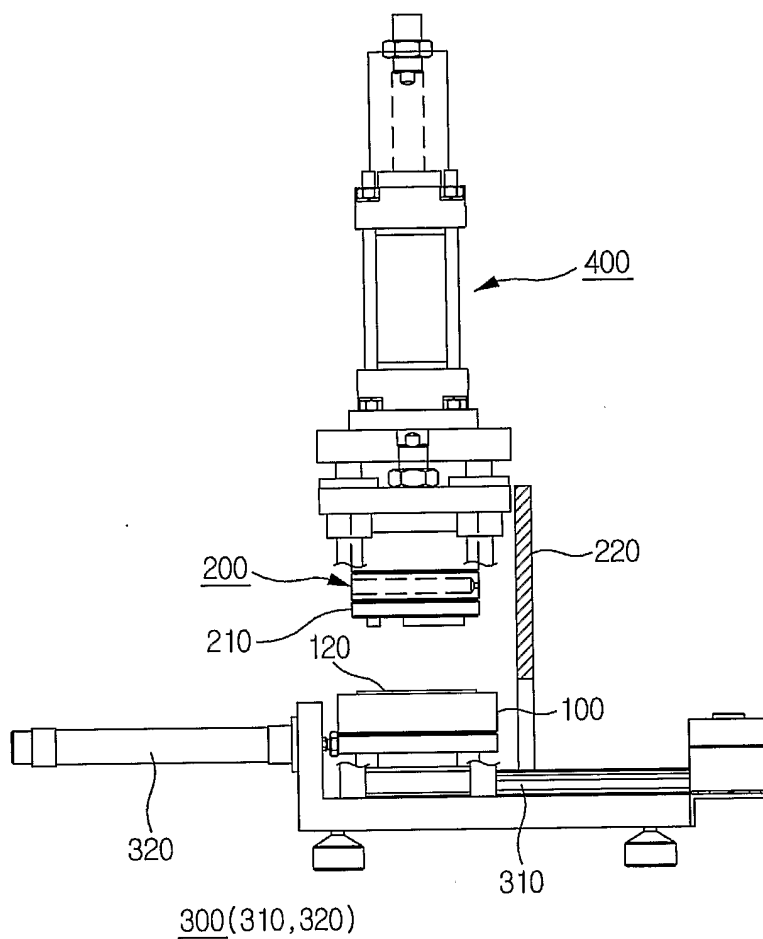


[Fig. 4]



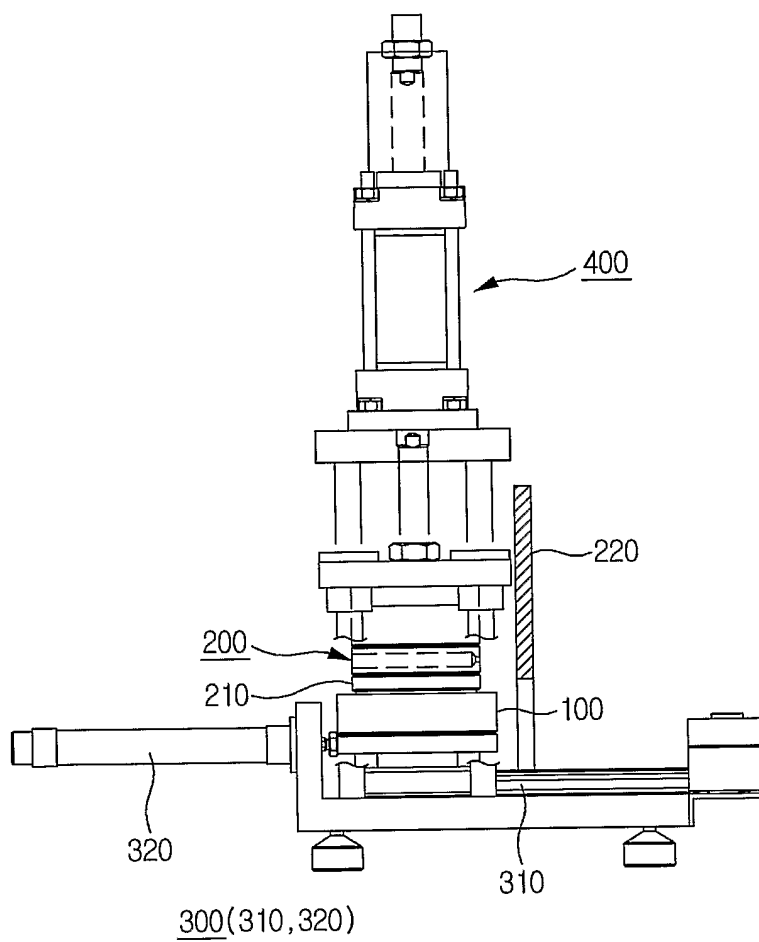
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[Fig. 5]

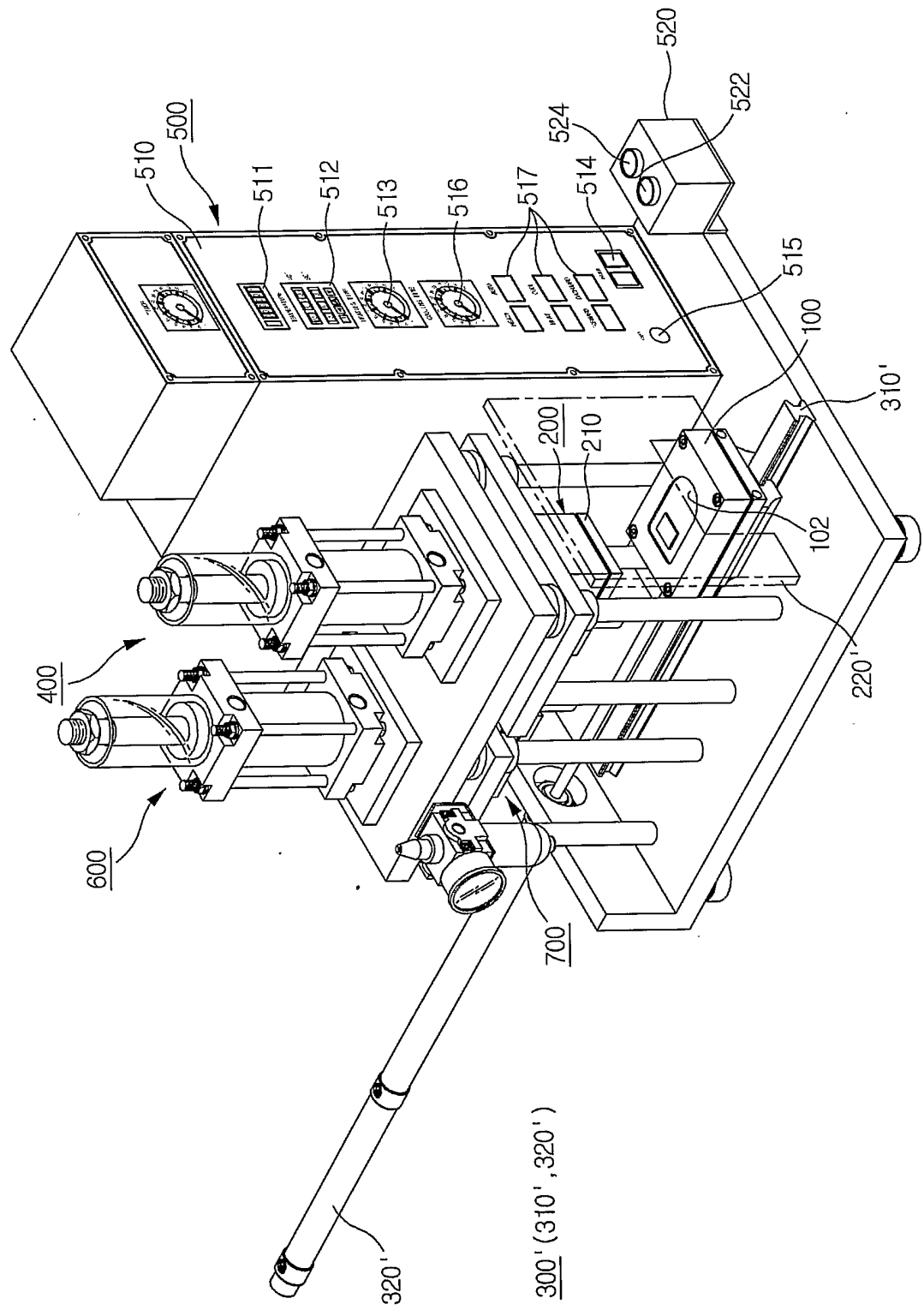


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[Fig. 6]

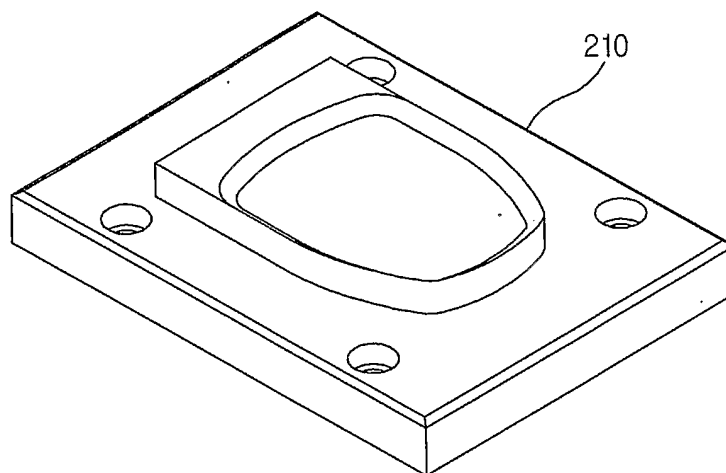


[Fig. 7]

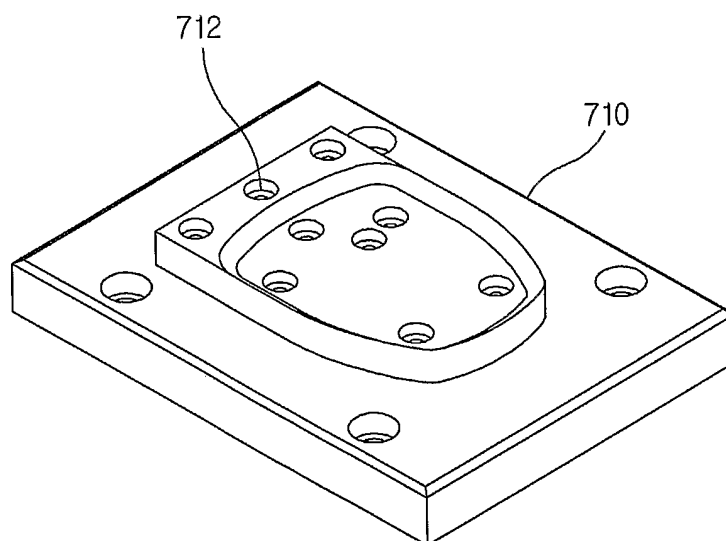


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[Fig. 8]

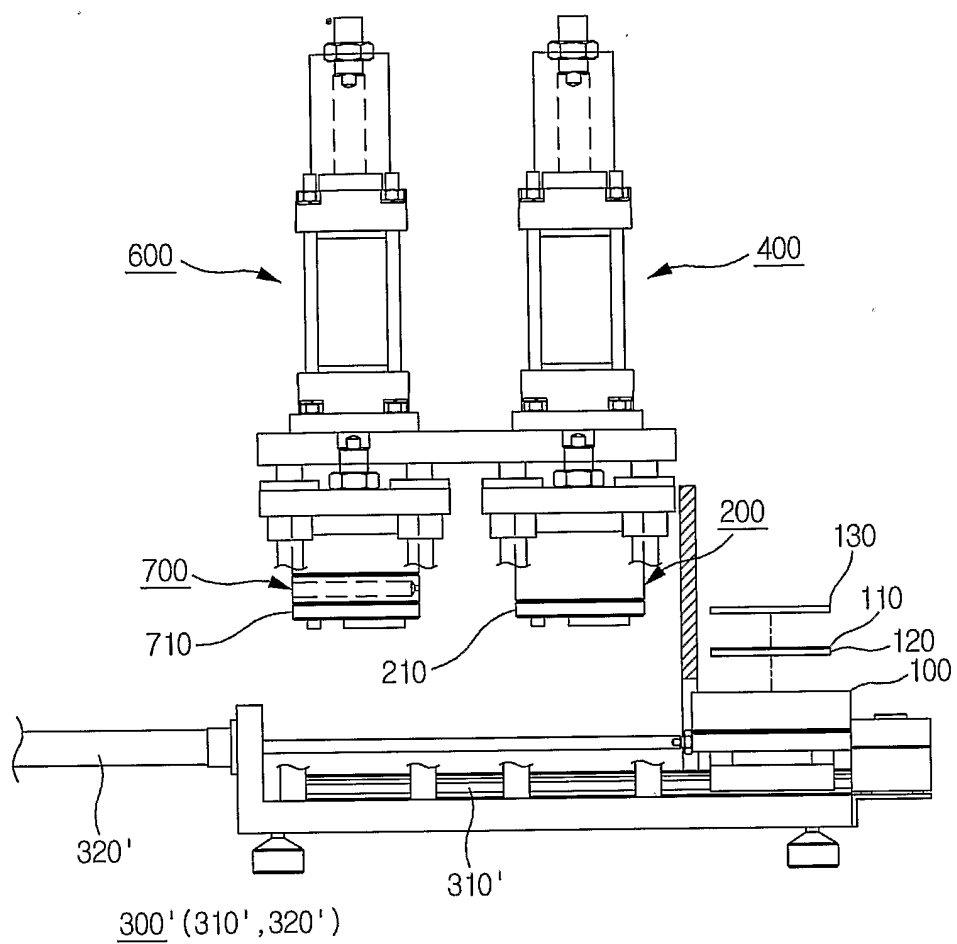


[Fig. 9]



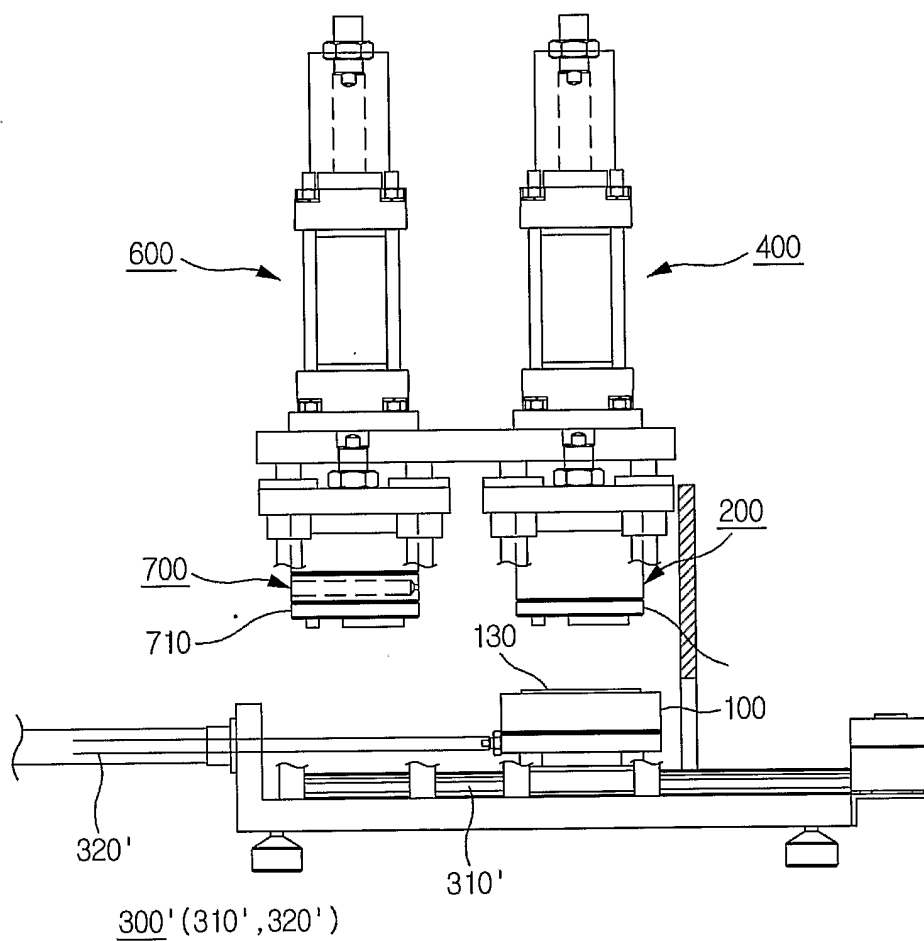
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[Fig. 10]



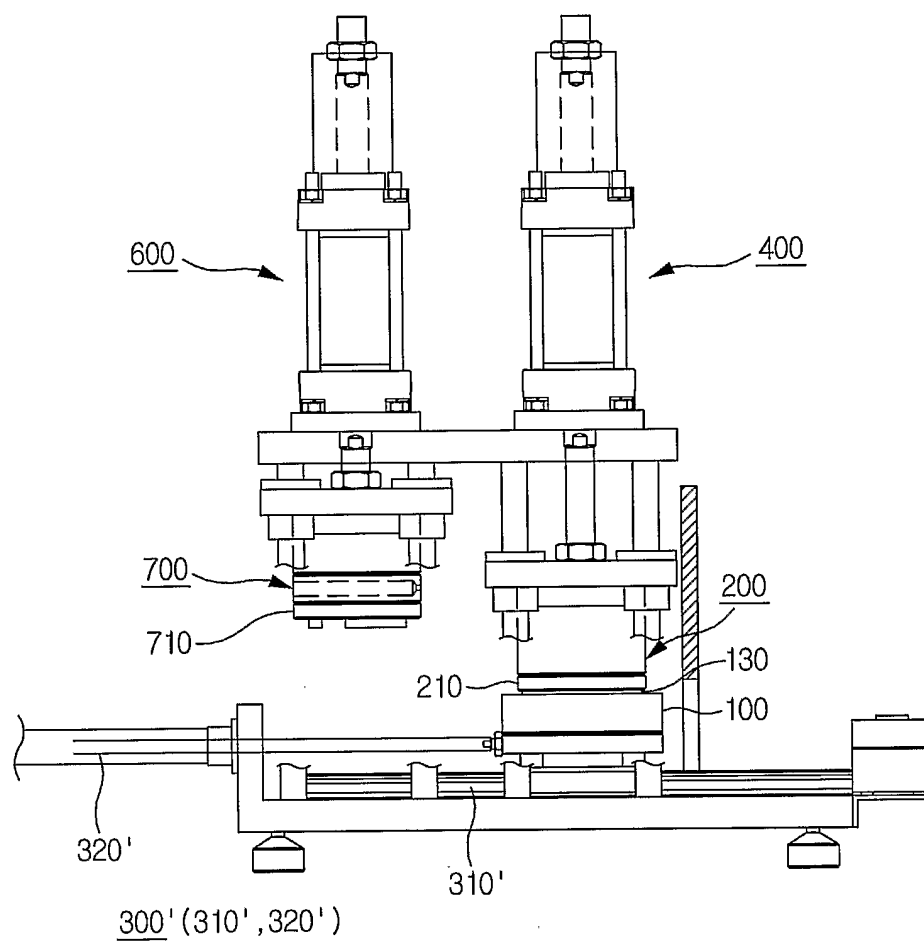
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[Fig. 11]



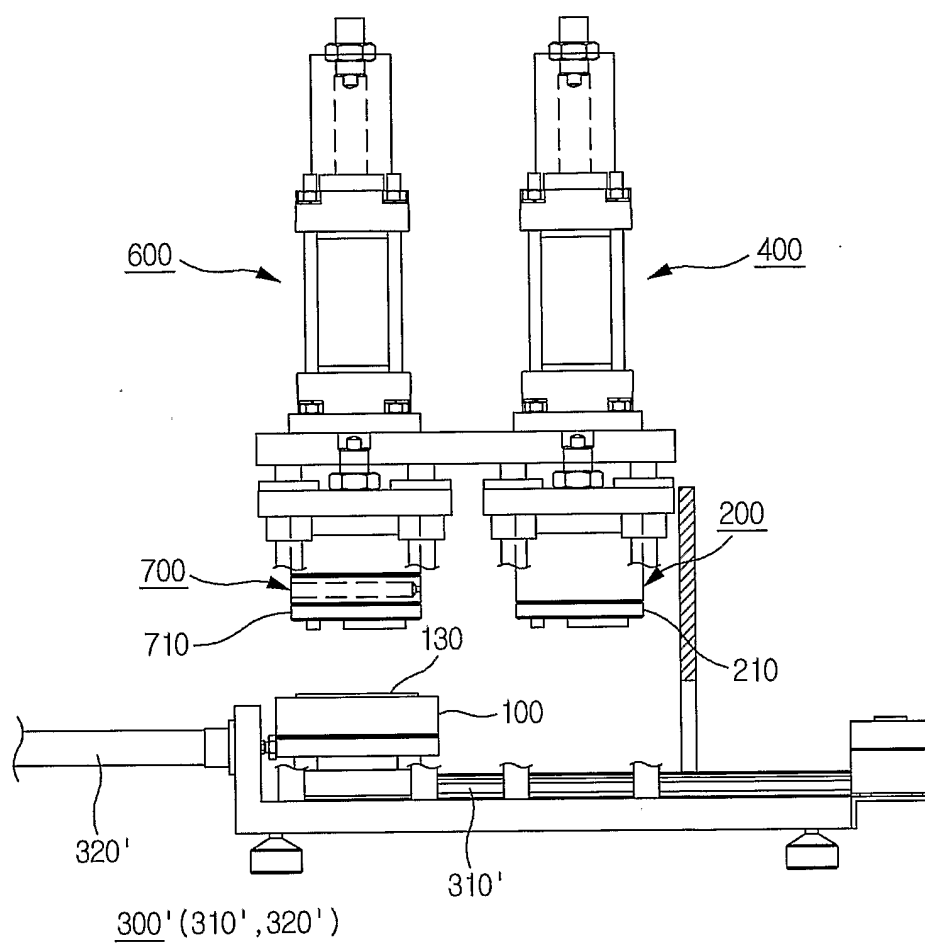
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[Fig. 12]



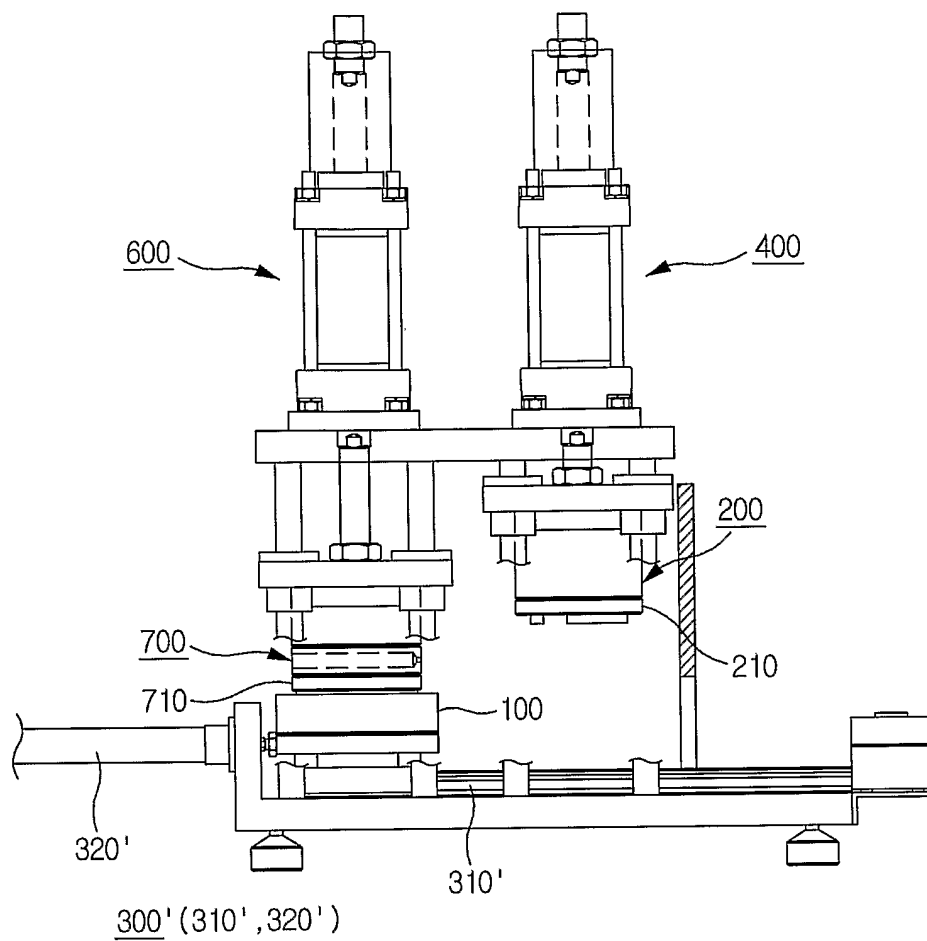
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[Fig. 13]

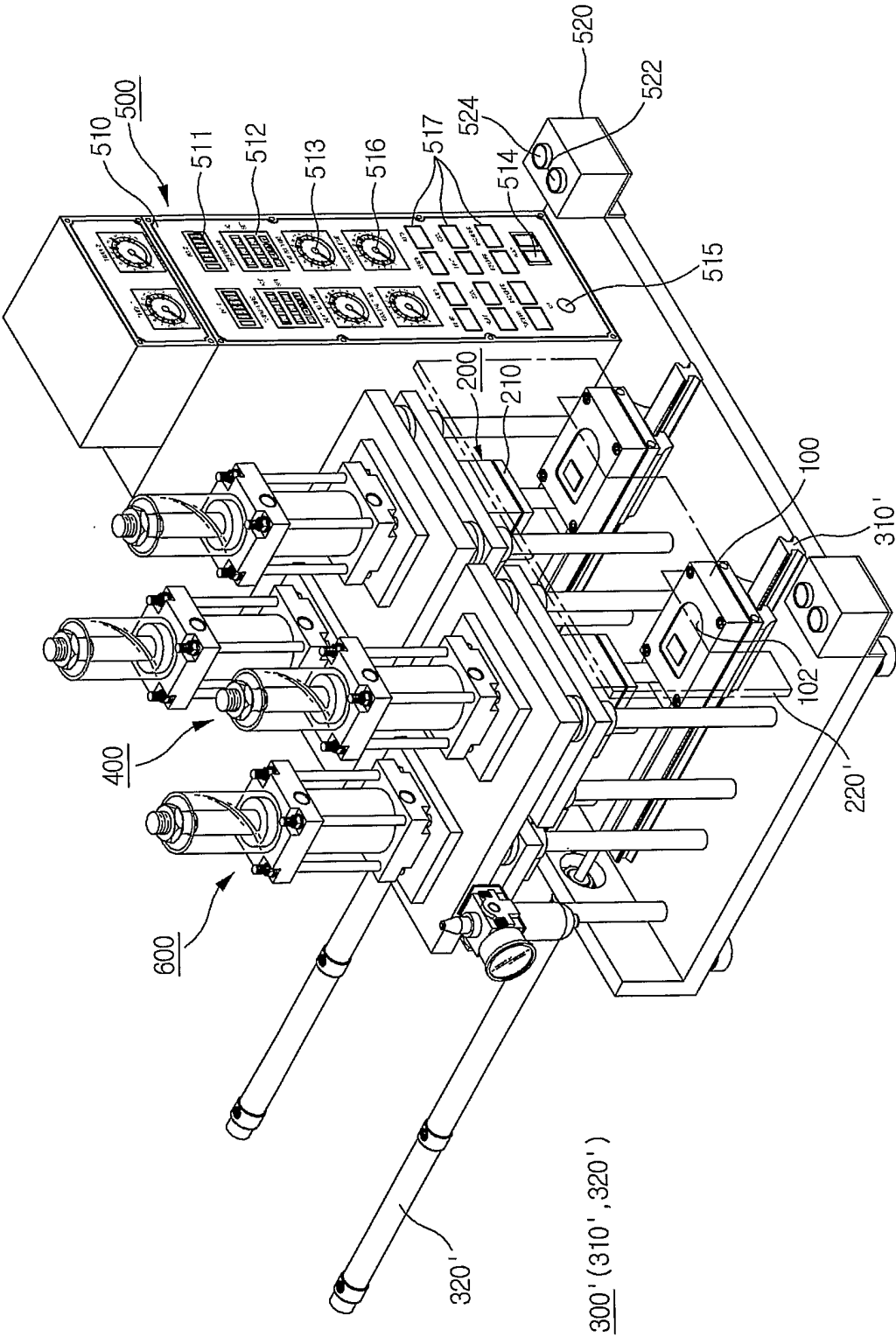


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[Fig. 14]



[Fig. 15]



INTERNATIONAL SEARCH REPORT

International application No.
PCT/KR2004/001229

A. CLASSIFICATION OF SUBJECT MATTER

IPC7 B29C 65/18, H04B 1/38, B23K 13/00, B29C 65/44

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)

IPC7 B29C 65/18, H04B 1/38, B23K 13/00, B29C 65/44

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Korean Patents and Applications for Inventions since 1975

Korean Utility Models and Applications for Utility Models since 1975

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

KIPASS, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	KR 287714 Y1 (Charm Tech.) 05 September 2002 see the whole document	1-9
A, P	KR 320962 Y1 (Chung Soo-Yong) 22 July 2003 see the whole document	1-9
A	KR 1999-34794 U (Chung Soo-Yong) 06 September 1999 see the whole document	1-9
A	JP 07-47608 A (Sekisui Chem Co. Ltd.) 21 February 1995 see the whole document	1-9
A	JP 09-239841 A (Sony Corp.) 16 September 1997 see the whole document	1-9



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See patent family annex.

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