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(19) **United States**(12) **Patent Application Publication****Lisec**(10) **Pub. No.: US 2004/0188485 A1**(43) **Pub. Date: Sep. 30, 2004**(54) **PROCESS AND DEVICE FOR DIVIDING SHEETS OF GLASS**(52) **U.S. Cl. .... 225/1**(76) **Inventor: Peter Lisec, Amstetten-Hausmending (AT)**(57) **ABSTRACT**

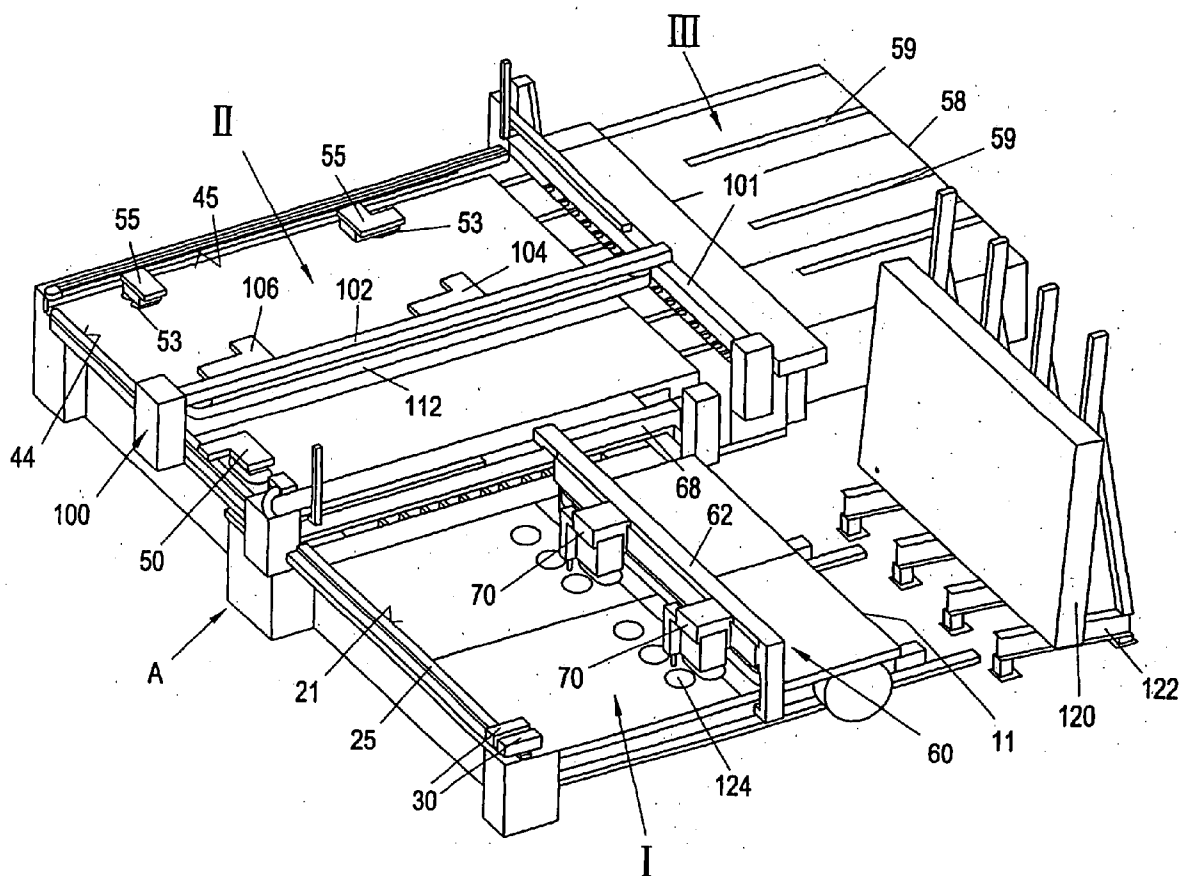
Correspondence Address:

**YOUNG & THOMPSON****745 SOUTH 23RD STREET 2ND FLOOR  
ARLINGTON, VA 22202**(21) **Appl. No.: 10/787,744**(22) **Filed: Feb. 27, 2004**(30) **Foreign Application Priority Data**

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A unit for dividing glass sheets has two tables (I) and (II) and two separation sites (A) and (B). The table (I) which is located in front of the first separation site can be aligned to slope obliquely down toward the contact edge for moving the glass sheets located on it in the direction to this contact edge. The glass sheets adjoining the contact edge are moved gradually to the separation site and are divided there in the X direction. On table (II) there are two conveyor devices which can be independently actuated. Using these two conveyor devices, glass sheet shapes which travel onto the table (II) can be independently but simultaneously supplied to the separation site (B) so that it is possible to further divide these glass shapes on the given dividing lines in the separation site (B) at the same time or overlapping in time into glass shapes.



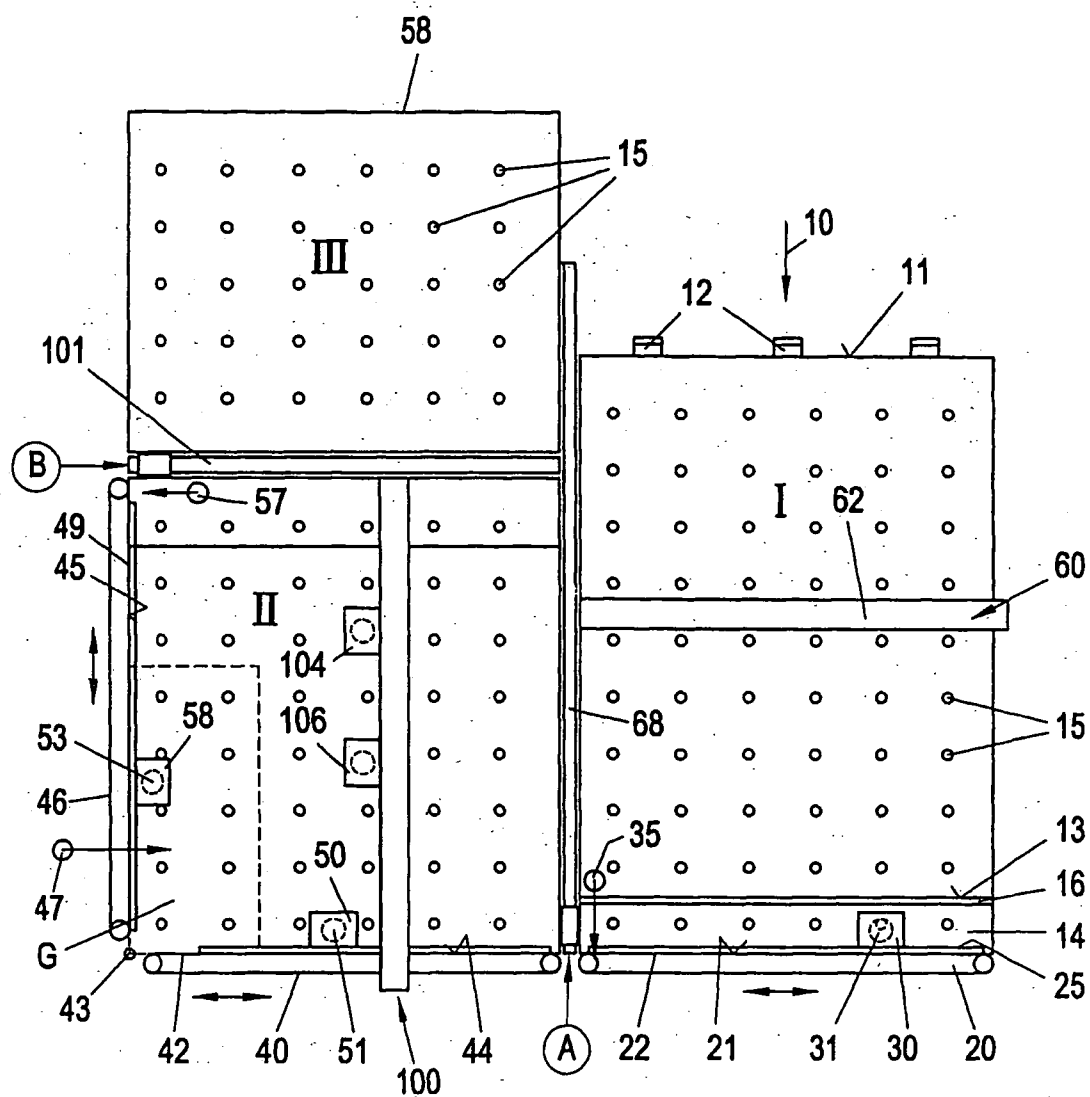
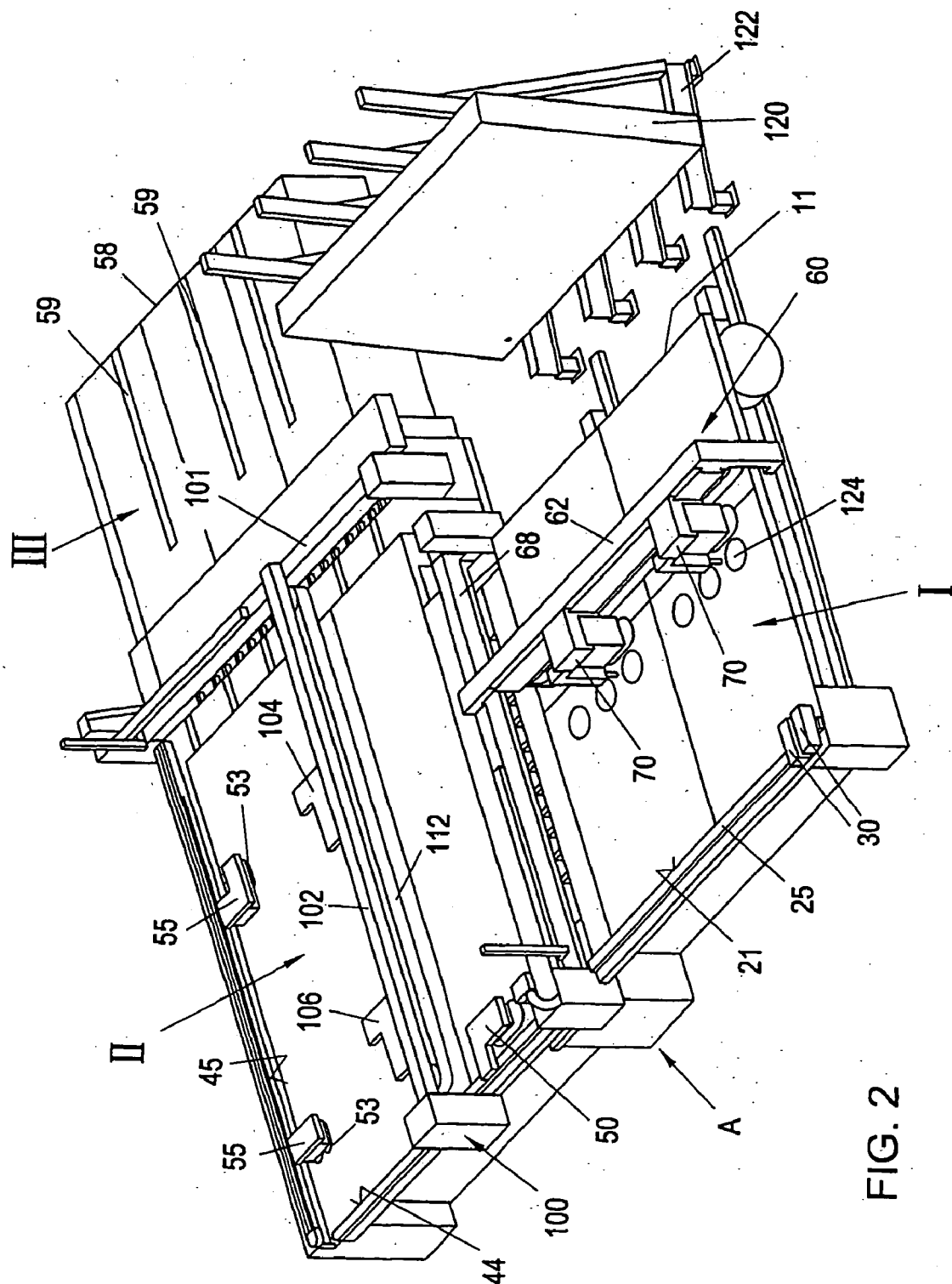


FIG. 1



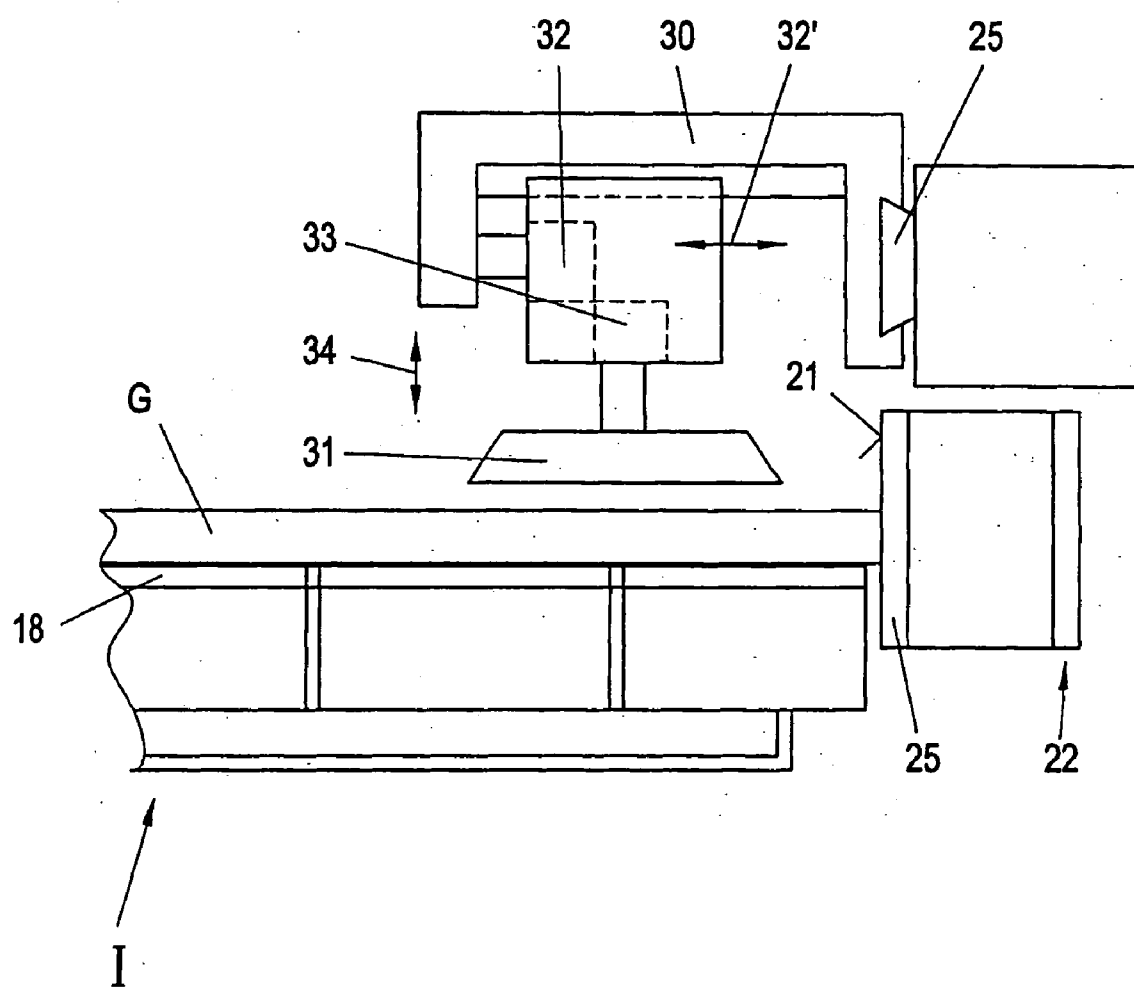
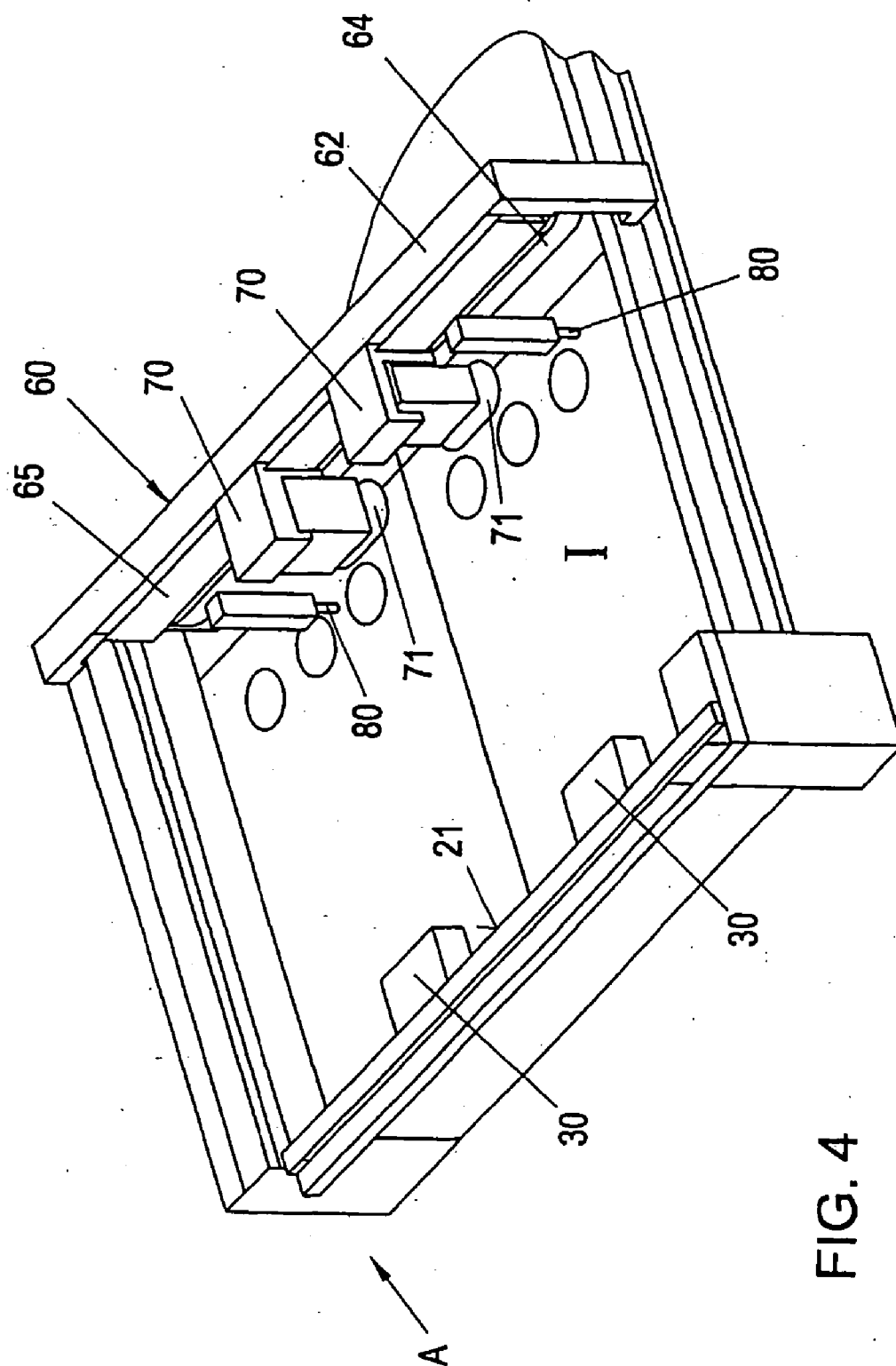


FIG. 3



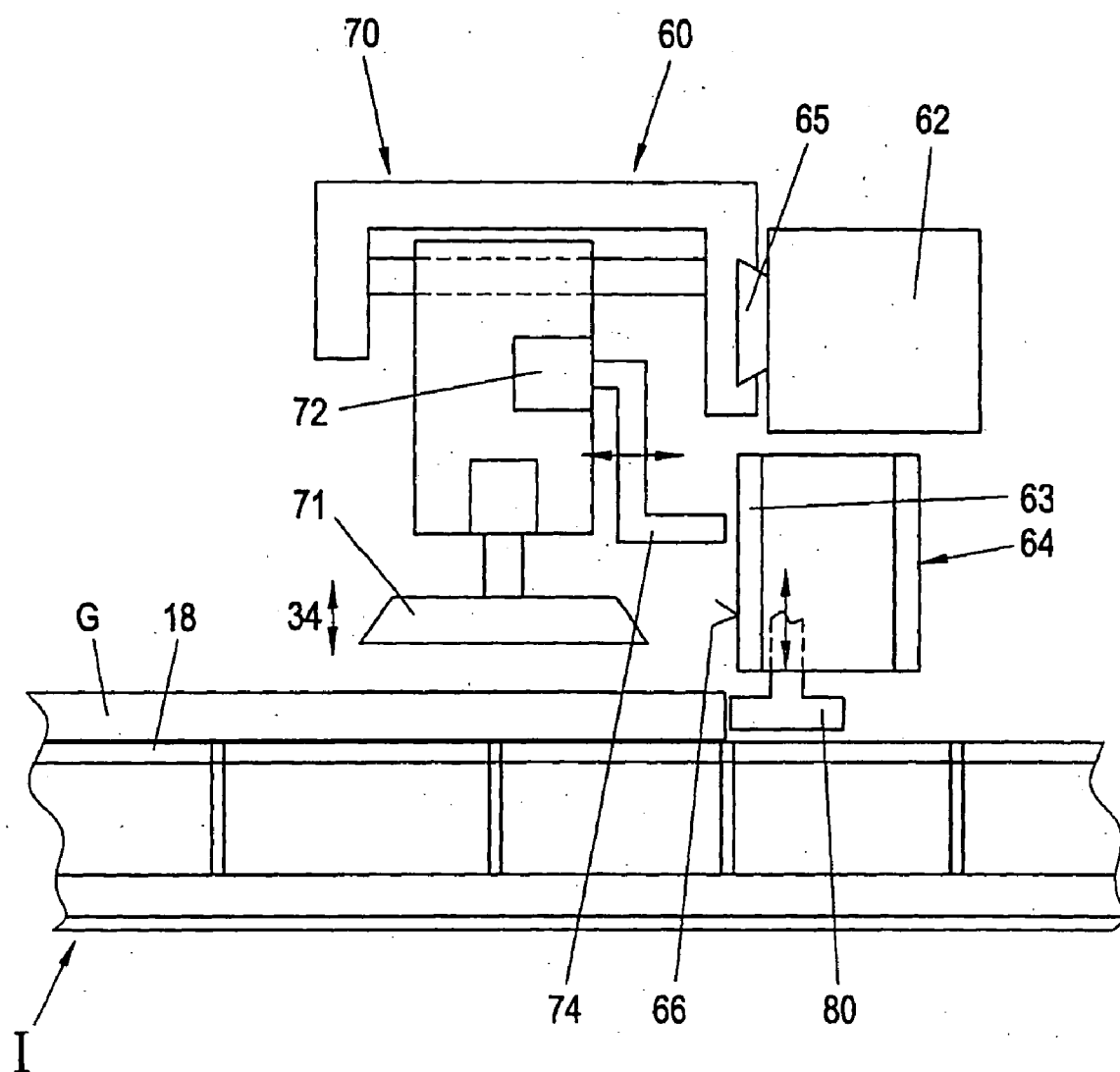
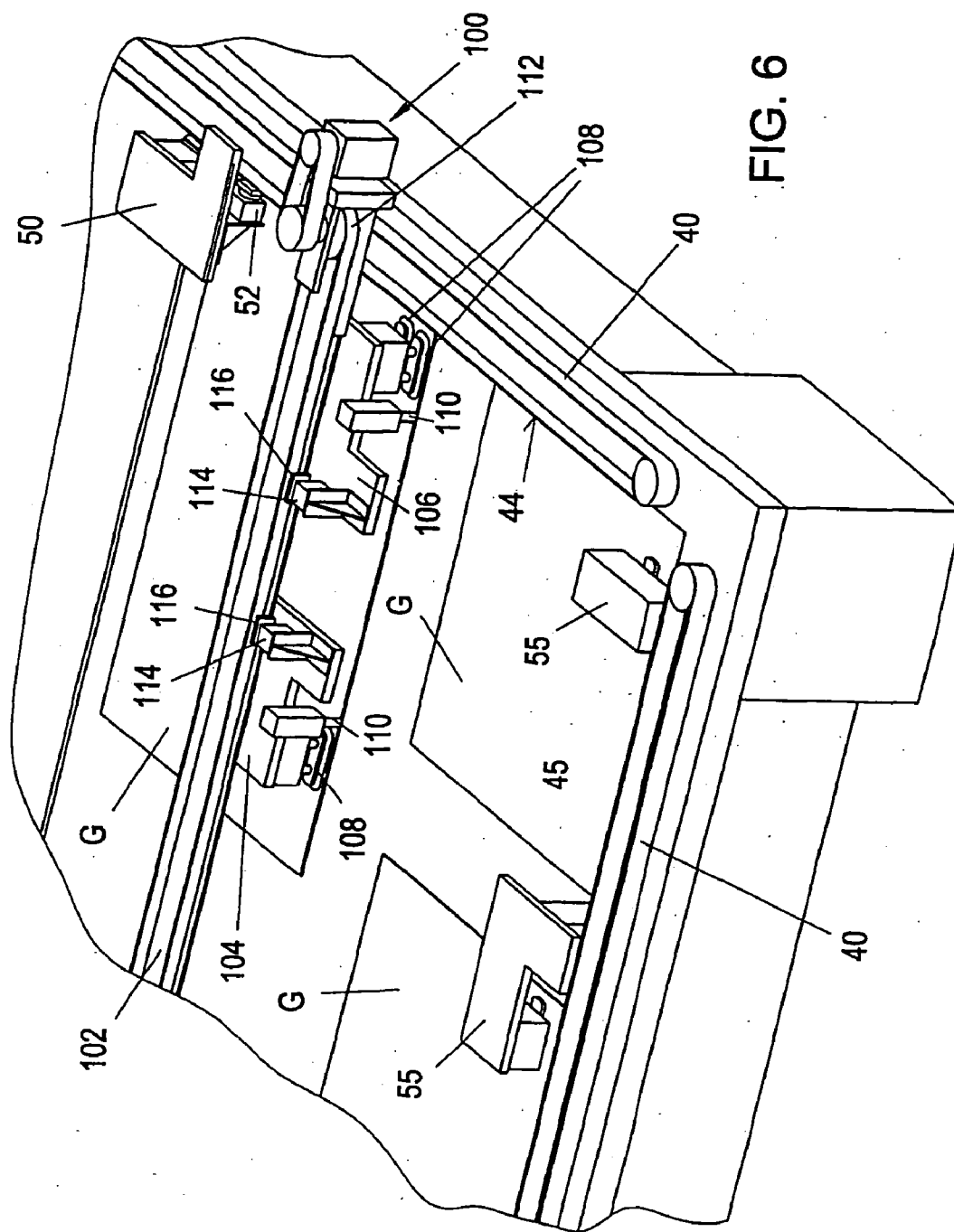
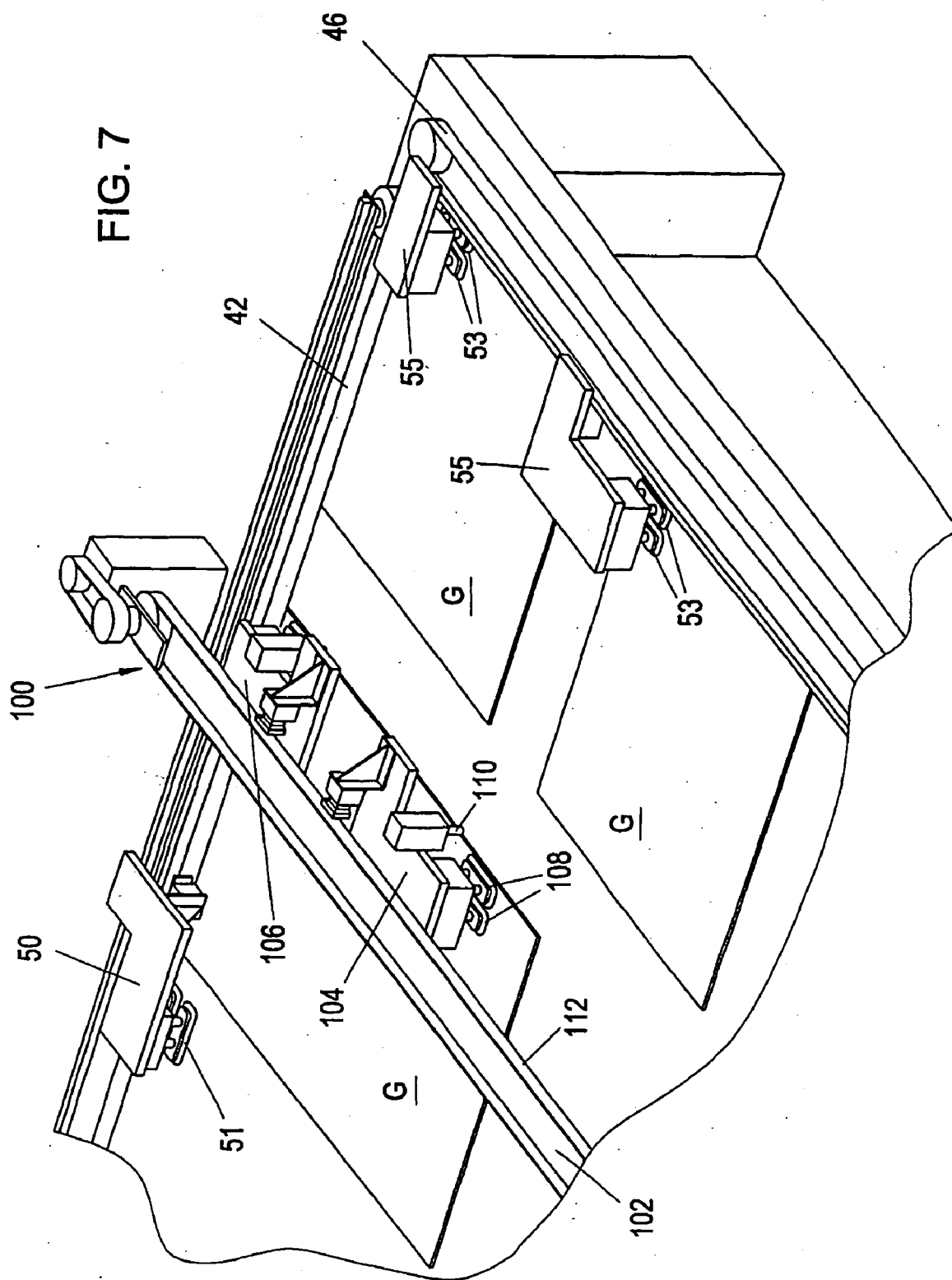


FIG. 5





## PROCESS AND DEVICE FOR DIVIDING SHEETS OF GLASS

[0001] The invention relates to a process and a device for dividing sheets of glass (glass cutting). The glass sheets under consideration here are for example sheet glass (float glass) and laminated glass.

[0002] The known devices for dividing glass sheets ("glass cutting tables") as are known for example from EP 0 564 758 A, for moving and positioning of glass sheets have conveyor belts and/or conveyor rollers which are recessed into the support surfaces of the glass cutting table and which are raised over the support surface when a glass sheet is to be transported.

[0003] These conveyor belts are also known in devices for dividing laminated glass (WO 95/16640 A=EP 0 708 741 A).

[0004] To move glass sheets on glass cutting tables, providing drivers for the glass sheets on the cutting bridge is furthermore known. Suction heads which are mounted on the cutting bridge (EP 0 192 290 A), or drivers which can be placed on the edge of a glass sheet (U.S. Pat No. 5,944,244) are known.

[0005] When glass sheets are divided, regardless of whether it is sheet glass (float glass) or laminated glass, generally the procedure is that first cuts are made which pass over the entire width of the glass sheet and the glass sheet is divided into several glass sheet shapes ("subplates") along these cuts. The glass sheet shapes ("subplates") which are obtained by separating the glass sheets along the X cuts must often be divided in the direction of the Y cuts. In the past the "subplates" which are obtained have been supplied individually to a separation device in which in succession each glass sheet shape ("subplate") obtained beforehand by division along the X cuts is further divided into glass shapes along the Y cuts.

[0006] This manner of operation is time-consuming and also results in that the dividing must be interrupted along the X cuts, or that the glass sheet shapes obtained after dividing along the X cuts must "wait" until they can be further separated along the Y cuts.

[0007] The object of the invention is to devise a process and a device of the initially mentioned type which allow accurate, prompt and simple separation of glass sheets (float glass and laminated glass) and which enables separation of glass sheet shapes which are to be further divided in an efficient and especially time-saving manner.

[0008] This object is achieved as claimed in the invention with a process which has the features of claim 1.

[0009] With respect to the device, this object is achieved with a device which has the features of the independent main apparatus claim.

[0010] Preferred and advantageous developments of the process as claimed in the invention on the one hand and the device as claimed in the invention on the other are the subject matter of the dependent claims.

[0011] The process as claimed in the invention takes place such that the glass sheet shapes obtained after division in the X-direction on the table which is provided after the first separation site are supplied jointly to a second separation site in which the glass sheet shapes ("subplates") are divided

along the Y cuts. Here it is provided that at least two such glass sheet shapes which are obtained by opening the X cuts and which are to be further divided are supplied at the same time to the other separation site. Here the procedure is preferably such that the glass sheet shapes supplied in succession to the separation site for the Y cuts are divided at the same time along the Y cuts. That the glass sheet shapes in doing so must be advanced by distances of different sizes is not a problem if the conveyor devices for the glass sheet shapes can work independently of one another.

[0012] With regard to the device, on the table provided between the two separation sites there are two conveyor devices which can be actuated independently of one another, and with which the glass sheet shapes ("subplates") which are to be further divided can be supplied to the other separation site.

[0013] In one preferred embodiment, in front of the first separation site, therefore the separation site in which the X cuts are made, there is no conveyor device for glass sheets, but the glass sheets are moved by tilting the table which is provided in front of the first separation site into a defined position. This can take place by the support surface of the table on which the glass sheet which is to be moved lies being tilted such that it slopes down in the direction to a reference line (contact edge), and the glass sheet which lies on it slides as far as this reference line (contact edge). The glass sheet is then positioned in a defined manner by adjoining at least one reference line (contact edge).

[0014] By choosing the angle of the tilt of the support surface and/or by choosing the coefficient of friction between the glass sheet and the surface of the support surface, glass sheets of varied size and weight can be taken into account.

[0015] In one embodiment, the glass sheets slide on an air cushion which is formed between the support surface of the first table and the glass sheet. An air cushion as the sliding surface for glass sheets also has the advantage that the friction between the glass sheet and the support surface can be set by setting the pressure with which air flows out of the air cushion openings in the support surface to the value which is desired at the time and if necessary can be changed during the movement of the glass sheet. This offers for example the possibility of reducing the friction at the start of the movement of the glass sheet and of increasing the friction before the end of the movement of the glass sheet, for example when it is approaching the reference line (contact edge) by lowering the pressure of the air which forms the air cushion.

[0016] Here it is possible to move a glass sheet which adjoins the contact edge which forms the reference line by frictional coupling of the glass sheet to a conveyor means over defined distances in order to feed it in a defined manner to the first separation site in which the glass sheet is divided (X cuts).

[0017] With regard to the device, the support surfaces in front of the first separation site, therefore the feed table for the first separation site (for X cuts) in the direction to at least one contact edge is tilted down or optionally is made additionally to be able to tilt so that they are aligned at an angle to the horizontal.

[0018] Furthermore, in the device as claimed in the invention, on the edge of each table at least one contact edge can

be made as the reference line which is generally aligned normally to the downstream separation site. This reference line (contact edge) is for example a conveyor belt. A glass sheet which is to be moved by the conveyor belt along the contact edge or a glass sheet shape is coupled to the respective conveyor belt. This coupling takes place for example via at least one coupling suction head which is movably guided on a rail parallel to the conveyor belt. After the suction head is applied to the glass sheet the latter can be loaded in the direction to the conveyor belt so that between the conveyor belt and the glass sheet frictional adherence is formed by one edge of the glass sheet or glass sheet shape being pressed against the conveyor belt by the suction head which is fixed on the glass sheet/glass sheet shape. This makes it possible to move the glass sheet by sliding on the support surface using the conveyor belt. A separate drive for the carriage which bears the coupling suction head in order to move it along the contact edge is not absolutely necessary.

[0019] Other details and features as well as advantages of the invention derive from the following description of one preferred embodiment with respect to the drawings in which a cutting unit (for laminated glass) is shown.

[0020] FIG. 1 shows a (laminated) glass cutting unit in an overhead view;

[0021] FIG. 2 shows a (laminated) glass cutting unit in an oblique view;

[0022] FIG. 3 schematically shows a suction head for coupling a glass sheet to a conveyor belt;

[0023] FIG. 4 shows one embodiment of the (laminated) glass cutting unit with a second conveyor means in the area in front of the first separation site;

[0024] FIG. 5 schematically shows a carriage with suction heads of the conveyor device from FIG. 4;

[0025] FIG. 6 shows the table which is located between the two separation sites in an oblique view (partially); and

[0026] FIG. 7 shows the table from FIG. 5 viewed from another direction.

[0027] In the embodiments shown in FIGS. 1 to 7 the illustrated unit for dividing laminated glass is formed and set up. This means that at each separation site A and B there are not only means for scratching the laminated glass from overhead and underneath, but also means for breaking the scratched laminated glass and for cutting the plastic film between the two panes of glass of the laminated glass. The separation sites A and B can be made for example as is shown and described in U.S. Pat. No. 5,704,959 A or in EP-1 108 690 A.

[0028] When the expression "glass sheet" is used below, it encompasses both simple sheet or flat glass ("float glass") and also laminated glass.

[0029] If the unit as claimed in the invention is intended as one for dividing normal glass (float glass), it is generally such that the scratching of the glass sheet along the cutting contour takes place separately from the breaking of the scratched glass sheets which is carried out at the separation sites A and B into glass sheet shapes and glass shapes. But both scratching and also breaking of glass sheets or glass sheet shapes at separation sites A and B are also taken into account. Devices for opening of cuts in glass sheets ("break-

ing") are described for example in U.S. Pat. No. 5,165,585 A or in U.S. Pat. No. 5,857,603 A. Making the separating devices such that they can be used selectively for dividing float glass and laminated glass at separation sites A and B is also considered.

[0030] The unit has a first table I on which glass sheets are placed in the direction of the arrow 10. The table I can also be folded up around its inlet-side edge 11 so that on it the glass sheets from a glass sheet storage are set up on support hooks 12 on this edge 11 and then by folding back the table I they can be shifted into the initial position which is essentially horizontal.

[0031] On the edge 13 which is opposite the edge 11 which is equipped with the hook 12 the table I is adjoined by a stationary strip 14.

[0032] The table I and the stationary strip 14 are preferably made as air cushion tables, i.e. distributed over their support surfaces there are openings 15, out of which compressed air flows so that a glass sheet lying on the table I floats on an air cushion.

[0033] The table I in the same manner as the tables II and III on its support surface can be made for example as is shown and described in U.S. Pat. No. 5,165,585-A. Alternatively or in addition the tables I, II, and III can be equipped with rollers so that a glass sheet lying on the support surface can be easily moved.

[0034] The table I, more accurately its support surface, can be tilted around the edge 13 which lies in the area of the joint 16 between the table I and the strip 14, in order to align the table I such that it is tilted down towards the contact edge 21. For example, the edge 11 of the table I equipped with the hooks 12 can be raised so that the table I slopes down in the direction to the strip 14. A glass sheet which lies on the tilted table I slides on the table I, for example on an air cushion, "down" until it rests against the contact edge 21 which is formed by the strand 22 of the conveyor belt 20. This contact edge 21 which is formed by the conveyor belt 20 forms a reference line and defines the location of the glass sheet on the table I before it is moved to the separation site A (with a separating device for float glass or laminated glass).

[0035] The support surface of the Table 1 is moved into the horizontal position after a glass sheet adjoins the contact edge 21 and is fixed on it in the manner to be explained below. Then the table I in the same way as the separating device of the separation site A is horizontally aligned, as is conventional in glass cutting tables.

[0036] For reliable movement of the glass sheets on the table I small angles are sufficient, especially in air cushion tables. Thus, for example, the edge 11 of the table I for a table length of 3-5 m can be roughly 2 cm higher than the edge 13.

[0037] To move the glass sheet G on the table I in the direction to the separation site A, on a frame-mounted guide rail 25 which is aligned parallel to the conveyor belt 20 at least one carriage 30 (in the embodiment from FIG. 2 two carriages 30) is guided to be able to move freely. On the carriage 30 there is at least one suction head 31. The suction head 31 can be lowered for resting against the glass sheet G which lies on the support surface of the table I which is formed for example by a felt layer 18 by a hydraulic motor

**33** which is installed in the carriage **30** (arrow **34**, **FIG. 3**) and can then be loaded using another hydraulic motor **32** which is installed in the carriage **30** (arrow **32'**, **FIG. 3**). Thus the suction head **30** pulls the glass sheet G against the strand **22** of the conveyor belt **20** which forms the contact edge **21** (reference line), by which the glass sheet G is coupled by frictional adherence to the conveyor belt **20**. By moving the conveyor belt **20** the glass sheet G can be moved on the table I, the friction by the air cushion between the table I and the glass sheet G being small.

[**0038**] Just in front of the separation site A on the table I there is a device **35** (sensor) which detects the front edge of a glass sheet in order to define the reference position. Instead of this device **35** there can also be a simple stop which is moved away after fixing the reference position, for example, lowered.

[**0039**] By moving the conveyor belt **20** to which the glass sheet is coupled via (at least one) carriage **30** with (at least one) suction head **31** (there can be a separate drive for the carriage **30**, but it is generally not essential), the glass sheet is moved gradually to the separation site A and the X cuts are made in the glass sheet. The extent of advance of the glass sheet G to the separation site point A is detected with a path transducer (incremental encoder) which is coupled to the conveyor belt **20**, especially to its drive, and based on the paths of the glass sheet which have been detected in this way it is aligned relative to the separation site A such that it is divided at the desired site each time. Before displacement of the glass sheet G starts, the table I is moved (tilted) into its (horizontal) position which is parallel to the alignment of the separation site A.

[**0040**] The resulting glass strips (glass sheet shapes, so-called "subplates") travel onto the table II. This table II is horizontally aligned.

[**0041**] To convey a glass sheet shape away from the separation site A on the Table II on its edge **44** which is aligned perpendicular to the separation site A, there is a conveyor means for glass sheet shapes with which a glass sheet shape on Table II can be moved into contact with the two contact edges **44, 45** which are the two strands **42, 48** of the conveyor belts **40, 46**. Thus, one corner of the glass sheet shape G is located at the reference point **43**, in the example the intersection point of the two contact edges **44, 45**.

[**0042**] A sensor or limit switch **47** establishes that a glass sheet shapes adjoins the contact edge **45**.

[**0043**] In this embodiment, on the two contact edges **44, 45** of the table II there are conveyor belts **40, 46** to which suction heads **51, 53** on carriages **50, 55** (compare **FIG. 1**) are assigned, as were described above for table I. With the suction head **53** which is located on the contact edge **45** of the table II, which edge is parallel to the separation site A and which normal to the separation site B and opposite (away from) site A, the glass sheet shapes which are coupled, as described above, via at least one carriage **55** by at least one suction head **53** to the conveyor belt **46** is gradually transported to the separation site B (second separating device) in order to execute the separation processes in the Y direction. There can also be a sensor **57** for detecting the forward edge of the glass sheet shape in front of the separation site B.

[**0044**] The conveyor belt **40** on the contact edge **44** of the table II perpendicular to the separation site A and the carriage **50** which is provided there on the contact edge **44** with suction heads **51** is designed to move the glass sheet shapes along the contact edge **44**.

[**0045**] The table III which is located following the separation site B is flush with the table II so that the tables II and III lie in a (single) plane. In order to facilitate the removal of the glass sheet shapes obtained after dividing by the separation site B, the table III can be lowered after executing the separation process in the area of its edge **58**. In the table III lifting strips **59** can also be recessed for tilting the glass sheet shapes up.

[**0046**] On each of the contact edges **21, 44** and **45** of tables I and II there is at least one carriages **30, 50, 55** each with at least one suction head **31, 51, 53** (on the carriages there can also be two suction heads each). This is a minimum requirement, since there can also be two or more carriages **30, 50, 55** with at least one suction head **31, 51, 53** each on the contact edge **21**, the contact edge **44** and/or the contact edge **45** in order to reliably move large and/or heavy glass sheets (compare **FIG. 2**). Generally however one carriage per contact edge is sufficient, especially when it engages in the middle area of the glass sheets or glass sheet shapes and pulls them with relatively great force against the strand **22, 42, 49** of the respective conveyor belt **20, 40, 46**, which strand forms the contact edge **21, 44, 45** (reference line). If for example there are two carriages with at least one suction head **31** each on the contact edges **21, 44**, and/or **45**, they can also alternately engage glass sheets or glass sheet shapes.

[**0047**] In order to move the carriages **30, 50, 55** back into their initial position, the respective conveyor belt **20, 40, 46** is reversed, i.e. it runs in the opposite direction and the carriage **30, 50, 55** is coupled via a driver to the conveyor belt **20, 40, 46** by pressing the driver against the conveyor belt **20, 40, 46**.

[**0048**] In the area of the table I in this embodiment there is another conveyor device **60**. This conveyor device **60** can be used to move the glass sheet to the first separation site A in combination with the conveyor belt **20** and the carriage **30** on the contact edge **21**. The conveyor means **60** can however also be used to move another glass sheet to the separation site A at the same time or independently of the transport of a glass sheet by the conveyor belt **20** and the carriage **30**.

[**0049**] In particular the second conveyor means **60** in the area over the support surface of the table I is built as follows (**FIG. 5**): On the beam **62** which is mounted stationary on the table I, there is a continuously turning conveyor belt **64** at the bottom for example in the form of a toothed belt at a distance over the support surface **18** of the table I with a contact surface **66** which is aligned essentially normally to the support surface of the table I. Above the conveyor belt **64** on the beam **62** which can be mounted on the one hand on the table I and on the other on the beam **68** of the separation site A there is a guide rail **65** for (at least) one carriage **70**. The carriage **70** bears at least one suction head **71** which can be lowered onto a glass sheet G which lies on the support surface **18** of the table I (arrow **34**). Here the arrangement of the conveyor belt **64** is such that it has a distance from the support surface **18** of the table I which is so great that the thickest glass sheet G can be moved through under it.

[0050] In order to couple the carriage 70 by the suction head 71 to the conveyor belt 64, on the carriage 70 there is a hydraulic motor 72 which presses a plunger 74 against the strand 63 of the conveyor belt 64 which is adjacent to the carriage 70 so that the carriage 70 moves with the conveyor belt 64 and thus a glass sheet G on which the suction head 71 of the carriage 70 has been placed is also entrained.

[0051] In order to align a glass sheet G parallel to the direction of motion of the conveyor belt 64 of the conveyor device 60, there can be lowerable stops 80, for example contact pins, which define a "zero line" (reference line) and against which the glass sheet G is brought into contact.

[0052] It goes without saying that instead of one carriage 70 with at least one suction head 71 there can also be two or more carriages 70 each with at least one suction head 71 in order to enable safe transport of glass sheets G by the additional conveyor device 60 on the table I.

[0053] In one modified embodiment the conveyor device 60 can also be adjustable instead of stationary so that its distance from the contact edge 21 which is formed by the conveyor belt 20 can be changed.

[0054] In the illustrated embodiment of a device for dividing glass sheets (glass cutting table) in the area of the table II there is an additional conveyor means 100 with which glass sheet shapes can be conveyed on the table II to the second separation site B. This conveyor device 100 has a beam 102. The beam 102 is connected at a distance over the support surface of the table II by its end which lies in the area of the contact edge 44 to the frame of the table II and in the area of the second separation site B to the beam 101 of this separation site B. The beam 102 can be mounted stationary or can be adjustable transversely to the separation site A.

[0055] On the beam 102 in the illustrated embodiment two carriages 104, 106 can move on guide rails, each carriage 104, 106 bearing one or preferably two suction heads 108 which can be fixed by suction on the glass sheet shapes G lying on the support surface of the table II (obtained by dividing the glass sheet at the separation site A).

[0056] On each carriage 104, 106 there is furthermore a lowerable stop 110. The glass sheet shapes G are moved using the carriage 50 and the conveyor belt 40 into contact with the stops 110 in order to align them in a certain given reference position before they are moved from the conveyor means 100 to the separation site B.

[0057] The carriages 104, 106 with the suction heads 108 (two each) are moved along the beam 102 by coupling to an endless belt 112, for which the carriages 104, 106 can be fixed separately from one another by coupling devices 114 on the belt 112. The coupling devices 114 in the embodiment are plungers 116 which are located on the carriage 104, 106 with the capacity to be moved by hydraulic cylinders and which can be pressed against the belt 112.

[0058] In the embodiment shown in detail in FIGS. 6 and 7 at least one carriage 50 which can be moved on the contact edge 44 of the table II is designed to move the glass sheet shapes which have been obtained after division in the separation device A adjoining the reference line which is provided by the transport belt 40 in the area of the contact edge 44 away from the separation site A. To do this the

carriage 50 is movably guided in the area of the contact edge 44 of the table II on a guide rail. The coupling of the glass sheet shapes to the conveyor belt 40 takes place either (as explained above) by moving the suction head 51 on the carriage 50 in order to press the edge of the glass sheet shape against the conveyor belt 40, or the carriage 50 is coupled to the transport belt 40 provided there via a coupling device 52 similarly to the coupling devices 114 to the plungers 116 on the carriages 104, 106 in order to transport a glass sheet shape. In a first alternative it is provided that the suction head 51 on the carriage 50 can be moved perpendicular to the contact edge 44 so that the glass sheet is pulled by the actuation of the suction head 51 in the direction to the contact edge 44 against this contact edge (formed by the strand 42 of the conveyor belt 40). Using the carriage 50 glass sheet shapes are moved along the edge 44 either into contact with the contact edge 45 of the table II so that one of its corners is located at the reference point 43, or into contact with the contact finger 110 which has been lowered by the carriages 104, 106 on the beam 102. The coupling device 52 of the carriage 50 can also be used to couple the carriage 50 for transport back into its initial position (adjacent to separation site A) with the conveyor belt 40.

[0059] The two conveyor devices on the table II make it possible to move two glass sheet shapes independently of one another to the separation site B where the separating lines (Y cuts) can be aligned in the two glass sheet shapes by corresponding selection of the advance sections such that they can be opened at the same time.

[0060] Thus, like tables I and II, table III can also be aligned obliquely such that it is aligned declining in the direction in which the glass sheet shape is to be moved in order to support transport of glass sheet shapes away from the separation site A and/or toward the separation site B.

[0061] Preferably the table III in the same way as tables I and II is made as an air cushion table.

[0062] The operating sequence of the (laminated) glass cutting unit can be described by way of example as follows:

[0063] 1) The table I is folded up around its edge 11 to accept a glass sheet from a stack 120 of glass sheets which are standing on a support 122. The glass sheet is fixed on the table I via several suction heads 124.

[0064] 2) The table I is tilted into the position which slopes down toward the contact edge 21. The air cushion on the table I is started up and the glass sheet then slides on the air cushion toward the contact edge 21.

[0065] 3) In this position the glass sheet is coupled by frictional adherence to the conveyor belt 20 of the contact edge 21 by at least one suction head 31 on the carriage 30 (or by the suction heads on several, for example two carriages 30).

[0066] 4) By actuating the conveyor belt 20 the glass sheet is advanced until it is correctly aligned relative to the separating device A for a (first) separation process (X cut).

[0067] 5) The table I has been swivelled into its horizontal position beforehand.

[0068] 6) Then, when the tables I and II are flush with one another (both are aligned horizontally) the glass sheet shape is severed by the separation device of the separation site A.

The resulting glass sheet shape ("subplate") lies on the table II. On the table II on an air cushion which is produced between the support surface and the glass sheet shape by coupling of the glass sheet shape to the carriage **50** which is provided on the contact edge **44** this glass sheet shape is coupled via the suction head **51** to the conveyor belt **42** which is provided on the stop **44**, and is moved on the table II until one corner of the glass sheet shape comes to rest at the reference point **43**.

[0069] 7) As soon as the separation device of the separation site A is free, another glass sheet shape is severed from the glass sheet which has been advanced accordingly on the table I.

[0070] 8) The second glass sheet shape is advanced along the contact edge **44**, as was described above, by the conveyor belt **40** until it adjoins the contact pins **110** which are provided on the carriages **104**, **105** on the bridge **102**.

[0071] 9) At this point, simultaneously or independently of one another, the two glass sheet shapes lying on the table II are moved on the one hand by the carriage **55** on the contact edge **45** of the table II and the carriages **104**, **106** on the beam **102** on the other hand to the separation device of the separation site B.

[0072] 10) The Y cuts are opened in the separation site B in the glass sheet shapes and in this way the desired glass shapes are obtained which then travel on the table III. In doing so the process takes place such that in the two glass sheet shapes ("subplates") which are supplied to the separation site B and which are advanced next to one another on the table II to the separation site B the Y cuts are opened at the same time.

[0073] 11) To remove the glass shapes which have been produced following the separation site B the table III can be tilted such that it is aligned sloping down from the separation site B toward the edge **58**.

[0074] 12) Using the lifting strips **59**, glass shapes can be lifted off the table III and can be set up essentially vertically in order to deposit them for example on a glass storage frame.

[0075] In summary, one embodiment of the invention can be described as follows:

[0076] A unit for dividing glass sheets (float glass or laminated glass) has two tables I and II and two separation sites A and B. The table I which is located in front of the first separation site A can be aligned to slope obliquely down toward the contact edge **21** for moving the glass sheets located on it in the direction to the contact edge **21**. The glass sheets adjoining the contact edge **21** are moved gradually using the transport device to the separation site A and are divided there in the X direction. On the second table II which is located between the two separation sites A and B there are two conveyor devices **100** and **46**, **55** which can be actuated independently of one another. Using these two conveyor devices, the glass sheet shapes which travel onto the table II can be supplied independently of one another but at the same time to the separation site B so that it is possible to further divide these glass shapes on the given dividing lines in the separation site B at the same time or overlapping in time into glass sheet shapes.

1. Process for dividing glass sheets into glass sheet shapes according to a given dividing pattern, in which glass sheets are divided in at least one first division step in one direction (X cuts) and into glass sheet shapes, then in at least one second dividing step in a direction which is perpendicular to the first division step (Y cuts) into glass shapes, characterized in that glass sheet shapes obtained after the first division step (separation site A) are supplied jointly to a second separation site (B) for carrying out second division steps.

2. Process as claimed in claim 1, wherein the second division steps (Y cuts) are carried out for at least two glass sheet shapes at the same time.

3. Process as claimed in claim 1, wherein the glass sheet shapes of the second separation site (B) resting on a table (II) are supplied from conveyor means which are separate from one another in order to execute the second division steps.

4. Process as claimed in claim 1, wherein (single) glass sheets are divided according to scratch lines already produced beforehand when executing the second division steps, especially by bending.

5. Process as claimed in claim 1, wherein (single) glass sheet shapes in the second separation site (B) are divided into glass shapes by scratching and dividing along the produced scratch lines, especially by bending.

6. Process as claimed in claim 1, wherein the laminated glass when executing the second division step is first scratched on both sides, then the two glass panes of the laminated glass are broken along the scratch lines and finally the plastic film after pulling apart the parts of the glass sheet shape obtained in this way is cut.

7. Device for executing the process as claimed in claim 1, with at least two separation sites (A, B) in which the glass sheets are divided into glass sheet shapes or glass shapes in directions perpendicular to one another, in front of the first separation site (A) there being a table (I) and between the two separation sites (A, B) there being a table (II), each with a support surface for the glass sheets or the glass sheet shapes, wherein on the table (II) there are two conveyor devices (**46**, **55**) and (**100**) which can be actuated independently of one another for moving the glass sheet shapes (G) which have been obtained after the first separation site (A) toward the second separation site (B).

8. Process as claimed in claim 7, wherein the conveyor devices (**46**, **55**; **100**) have carriages (**55**; **104**, **106**) which can be moved along guideways and which can be fixed on the glass sheet shapes.

9. Process as claimed in claim 8, wherein on the carriages (**55**; **104**, **106**) there is at least one suction head (**53**, **108**) each which can be placed against the top of the glass sheet shapes.

10. Process as claimed in claim 7, wherein each conveyor device (**46**, **55**; **100**) has at least two carriages (**55**; **104**, **106**) with at least one suction head (**53**, **108**) each.

11. Process as claimed in claim 7, wherein on the table (II) which is provided between the separation sites (A, B) there is a third conveyor device (**40**, **50**) for moving the glass sheet shapes (G) in the direction perpendicular to the first separation site (A).

12. Process as claimed in claim 11, wherein the third conveyor device has at least one carriage (**50**) which can be fixed on the glass sheet shape (G).

13. Process as claimed in claim 12, wherein the carriage (**50**) has at least one suction head (**51**) which can be fixed on the glass sheet shape (G).

14. Process as claimed in claim 11, wherein there is a conveyor device (40, 50) which acts perpendicular to the separation direction of the first separation site (A) on the edge (44) of the table (II).

15. Process as claimed in claim 7, wherein the carriages (104, 106) of one conveyor device (100) which conveys the glass sheet shapes (G) to the second separation site (B) can be moved on a guide (102) which extends over the table (II) and which is attached to the edge of the table (II).

16. Device as claimed in claim 7, wherein the carriage (55) of the other conveyor device (46, 55) which conveys the glass sheet shapes (G) to the second separation site (B) can be moved on a guide (102) which is located along the edge of the table (II), which edge is parallel to the first separation site (A).

17. Device as claimed in claim 15, wherein the carriage (104, 106) which can be moved on the beam (102) has at least one contact pin (110) for aligning the glass sheet shape (G).

18. Device as claimed in claim 8, wherein the carriages (55; 104, 106) which can be moved on the table (II) can be coupled to continuous conveyor belts (46, 112).

19. Device as claimed in claim 18, wherein for coupling to the conveyor belts (46) the suction head (53) of the

carriages (55) which is fixed on the glass sheet shape takes place in the direction to the conveyor belt (46) such that the glass sheet shape rests by frictional adherence on the conveyor belt (46).

20. Device as claimed in claim 18, wherein the carriages (104, 106) which can be moved on the beam (102) can be coupled by coupling devices (114) to the continuous conveyor belt (112).

21. Device as claimed in claim 20, wherein the coupling device bears a clamping plunger (116) which can be placed against the conveyor belt (112).

22. Device as claimed in claim 7, wherein the table (I) which is provided in front of the first separation site (A) can be aligned sloping down in the direction to the edges (13) which run transversely to the direction of action of the first separation site (A).

23. Device as claimed in claim 7, wherein next to the table (I) in front of the first separation site (A) there is a device for depositing glass sheets.

24. Device as claimed in claim 23, wherein the table (I) can be folded up for accepting glass sheets from a stack (120).

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