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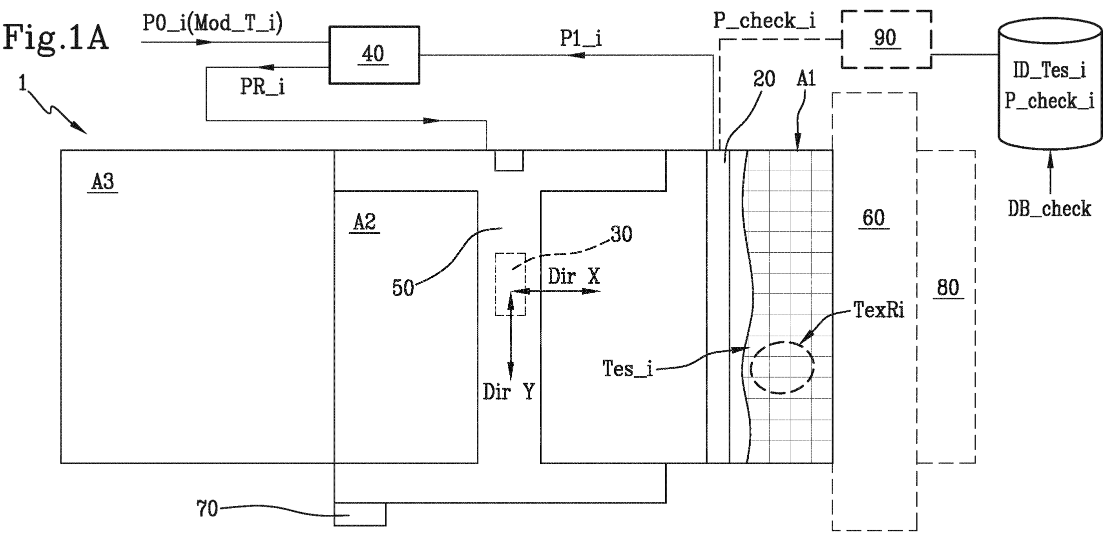
(54) **APPARATUS AND METHOD FOR CONTINUOUS DETECTION AND CUTTING OF FABRIC FOR ITEMS OF CLOTHING**

(57) The invention describes an apparatus (1) for continuous detection and cutting of fabric (tes_i) bearing a predefined real striped and checked pattern (TexR_i), for making an item of clothing (Ci), it comprises a loading area (A1) for loading fabric (tes_i); movement means (10) for moving the fabric (tes_i); detection means (20) arranged to detect from the fabric (tes_i) at least effective points (P1_i) representative of meeting points detected in the predefined pattern (TexR_i); a processing unit (40) for processing effective (P1_i) and/or theoretical points (P0_i;i=1..n) configured to: receive the theoretical points P0_i, representative of a theoretical pattern (Tex_i) reproduced on component parts (Cij) of items of clothing (Ci); receive the effective points (P1_i) detected, representative of meeting points detected of the predefined real pattern (TexR_i) in the fabric (tes_i) detected; make a comparison by points between the theoretical points (P0_i) and the effective points (P1_i); determine real meeting points (PR_i) of the real pattern (TexR_i) in the component parts (Cij) at least according to the comparison by points; a cutting area (A2) arranged downstream of said loading area (A1); a cutting head (30) configured to cut the fabric (tes_i) according to the real meeting points (PR_i) determined.

The invention also describes a corresponding method for continuous detection and cutting, a computer program configured to perform the method, and a graphical user interface configured to display on a display device the steps performed by the method and/or by the computer program.

Fig.1A



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Description

Field of application

[0001] The invention relates to the field of preparation of items of clothing, in particular made with fabrics with striped and/or checked patterns.

[0002] In particular, the invention relates to an apparatus/method for continuous detection and cutting of fabrics bearing striped and/or checked patterns for making items of clothing and the following description refers to this field of application to simplify its presentation.

Prior Art

[0003] It is known that a considerable part of the haute couture clothing items sold is made with striped and/or checked patterns.

[0004] It is also known that an exact match between the start and end of a stripe/check in two component parts sewn to one another in an item of clothing is an irrefutable index of the quality of the item of clothing, as well as a requirement for a necessary aesthetic factor of continuity.

[0005] Fabric cutting machines exist on the market for making these items of clothing.

[0006] In these machines, the fabric input into the cutting area is photographed by a camera mounted on a cutting head; the camera takes a series of photos of sample parts of the fabric, so as to photograph a sample of the pattern shown on the same.

[0007] Once the camera has taken the photos, it makes them available to an operator who, after viewing them, uses a mouse to select the points of the photographed pattern corresponding to the points of a predefined target model of an item of clothing to make.

[0008] Unfortunately, since the search for significant points in the pattern is led by the operator, errors are never inevitable, even though the operations are carried out with the utmost care.

[0009] In addition, with this method, the guarantee of an optimal result is not predictable because even small inaccuracies in the operator's pointing can result in noticeable discontinuities in the pattern of the item of clothing.

[0010] Additionally, the pictures taken, in part obtained by interpolation, could already contain intrinsic errors which are independent of the operator's skill in choosing.

[0011] Lastly, the production of component parts of items of clothing using these methods is dramatically slow because the operations of photographing the images (i.e. the detection), the selection by the operator, and the cutting are carried out strictly in sequence, in addition to a non-negligible amount of time required for the operator's intervention.

[0012] A general object of the present invention is to overcome the drawbacks of the known art.

[0013] A specific object of the invention is to provide a continuous detection and cutting system of fabric for items of clothing and a corresponding detection and cutting method that is optimised in terms of execution efficiency.

[0014] A further object of the present invention is to provide a continuous detection and cutting system of fabric for items of clothing and a corresponding detection and cutting method that minimises the execution time.

[0015] Another object of the present invention is to provide a continuous detection and cutting system for items of clothing and a corresponding method for the detection and cutting of fabric that allow a precise alignment of stripes/checks between different component parts of the item of clothing to be made.

Summary of the invention

[0016] These and other objects are achieved by the invention claimed.

[0017] In a first aspect, the invention describes an apparatus for the continuous detection and cutting of fabric, bearing a predefined real striped and/or checked pattern, for making items of clothing, comprising:

a loading area for loading fabric, into which the fabric is loaded for being detected;
a movement means for moving said fabric away from said loading area in an advancement direction;
a detection means arranged to detect from said fabric at least effective points representative of meeting points detected in said predefined real pattern, said detection means being arranged in said loading area;
a processing unit for processing effective and/or theoretical points configured for:

- receiving said theoretical points, representative of a theoretical pattern reproduced on component parts of said items of clothing on a theoretical target model;
- receiving said effective points detected, representative of meeting points detected from said predefined real pattern in said fabric detected;
- performing a comparison by points between said theoretical points and said effective points;
- determining real meeting points of said real pattern in said component parts at least according to said comparison by points;

a cutting area arranged downstream of said loading area with respect to said advancement direction;
a cutting head, associated with said cutting area, and arranged to cut said fabric, which has been received in said cutting area, according to said real meeting points determined;
wherein said fabric has been received in said cutting area starting from said loading area, by means of a movement applied by said movement means in said advancement direction.

[0018] Preferably, the processing unit is configured to perform said comparison by points between said theoretical points and said effective points according to the following steps:

- assessing a correspondence of the theoretical points on a theoretical grid at least partially relative to the cutting area with said effective points detected on said fabric in said loading area;
- in the event of lack of correspondence, moving said theoretical points so that they coincide with the effective points in order to allow the subsequent cutting of said component parts in conformity with the real fabric received.

[0019] Preferably, said theoretical points contain information representative of one or more from:

- a spatial relation of a component part with the fabric in said cutting area;
- a cross reference of a component part with another component part of the same item of clothing in said cutting area;

the two items of information defining a rule of composition of the item of clothing to be made with said component parts.

[0020] Preferably, said cutting head is configured to cut a first fabric in said cutting area simultaneously with one or more of the following operations:

- said processing unit processes said effective and/or theoretical points of a second fabric;
- said detection means detects a third fabric in said loading area.

[0021] Preferably, said processing unit is configured to process said effective and/or theoretical points while said fabric is transported from said loading area to said cutting area.

[0022] Preferably, said detection means is arranged to detect on said fabric defect indicators representative of non-conforming areas of fabric, hence determining corresponding defect points.

[0023] Preferably, said processing unit is further configured to process said defect points.

[0024] Preferably, said processing unit is configured to process said defect points through:

- receiving said defect points from said detection means;
- performing a comparison by defects between said theoretical points and said defect points;
- determining said real meeting points of the real pattern in said component parts also according to said comparison by defects.

[0025] Preferably, the apparatus comprises a two-dimensional guide that supports said cutting head, and is arranged to make said cutting head translate in said cutting area along two directions perpendicular to each other.

[0026] Preferably, the first direction is parallel to the advancement direction, while the second direction is perpendicular to the advancement direction

[0027] Preferably, said processing unit is configured to transmit said real meeting points to said two-dimensional guide so that said two-dimensional guide guides said cutting head to cut said fabric in said cutting area according to said real meeting points.

[0028] Preferably, said processing unit is configured to set the detection of said effective points and/or of said defect indicators according to:

- said theoretical pattern of said fabric defined in said target model;
- an effective pitch for the fabric at the inlet into the loading area A1.

[0029] Preferably, said processing unit is configured to detect a new effective pitch by detecting subsequent measurements of the effective pitch and changing the effective pitch with the new pitch value, when the new pitch value is repeated a predefined number of times.

[0030] In a second aspect, the invention describes a method, actuated through a computer, for the continuous detection and cutting of fabric, bearing a predefined real striped and/or checked pattern, for making items of clothing, comprising the steps of:

arranging a fabric;
arranging a loading area for loading fabric, into which said fabric is loaded for being detected;
detecting from said fabric, in said loading area, at least effective points representative of meeting points detected in said predefined real pattern;
moving said fabric away from said loading area in an advancement direction;
receiving from a processing unit theoretical points, representative of a theoretical pattern reproduced on component parts of said items of clothing on a theoretical target model;
receiving said effective points detected, representative of meeting points detected of said predefined real pattern in said fabric detected;
performing a comparison by points between said theoretical points and said effective points;
determining real meeting points of said component parts at least according to said comparison by points;
arranging a cutting area, downstream of said loading area with respect to said advancement direction;
cutting said fabric, in said cutting area (A2), according to said real meeting points determined.

[0031] Preferably, the cutting step is configured to cut, in said cutting area, a first fabric simultaneously with one

or more of the following operations:
processing, by said processing unit, effective and/or theoretical points of a second fabric arranged subsequently to the first;

- detecting a third fabric, arranged subsequently to the first or second, in said loading area (A1).

[0032] Preferably, the step of processing said effective and/or theoretical points is performed while said fabric is transported from a loading area to a cutting area.

[0033] Preferably, the step of processing said effective and/or theoretical points is configured to perform said comparison by points between said theoretical points and said effective points according to the following steps:

- assessing the correspondence of the theoretical points on a theoretical grid at least partially relative to the cutting area with said effective points detected on said fabric;
- in the event of lack of correspondence, moving said theoretical points so that they coincide with the effective points in order to allow the subsequent cutting of said component parts in conformity with the real fabric received.

[0034] Preferably, a step is provided for arranging a two-dimensional guide that supports said cutting head, and is arranged to make said cutting head translate in said cutting area along two directions perpendicular to each other.

[0035] Preferably, steps are provided for transmitting said real meeting points to said two-dimensional guide so that said two-dimensional guide guides said cutting head to cut said fabric in said cutting area according to said real meeting points.

[0036] Preferably, a step is provided for setting a detection of said effective points and/or of said defect indicators according to:

- said theoretical pattern of said fabric defined in said target model;
- an effective pitch for the fabric at the inlet into the loading area.

[0037] Preferably, a step is provided for detecting a new effective pitch by detecting subsequent measurements of the effective pitch and changing the effective pitch with the new pitch value, when the new pitch value is repeated a predefined number of times.

[0038] Preferably, said fabric is one of a multiplicity of fabrics, or a single fabric.

[0039] In a third aspect, the invention describes a computer program configured to perform the steps of the method of the second aspect of the invention.

[0040] In a fourth aspect, the invention describes a graphical user interface configured to display on a display device one or more of the steps performed by the method of the second aspect and/or by the computer program of the third aspect.

[0041] The proposed solution of the invention provides for an automatic continuous detection of fabric and striped and/or checked patterns reproduced on the same, while, simultaneously, the processing takes place of information obtained from a previously detected fabric and/or, simultaneously, in a cutting area the cutting takes place of a previously detected and processed fabric.

[0042] The different component parts made are prepared in conformity with a target model so that their composition determines an item of clothing with a precise alignment between stripes and checks.

[0043] The invention, as described, achieves the following technical effects:

- optimised cutting in terms of performance and efficiency of the apparatus involved;
- optimised cutting in terms of execution time;
- precise meeting of stripes/checks between the component parts of the item of clothing to make.

[0044] The technical effects/advantages mentioned, and other technical effects/advantages of the invention will emerge in further detail from the description provided herein below of an example of embodiment provided by way of approximate and non-limiting example with reference to the attached drawings.

Brief description of the drawings

[0045]

Figures 1A and 1B represent in general the system/method of the invention, according to the invention.
- figure 2 shows a theoretical positioning of components of an item of clothing with respect to a predefined theoretical area, according to the invention;
- figure 2A schematically shows the theoretical positioning of figure 2 with respect to a theoretical reference grid.
- figure 3 shows an actual positioning of components of an item of clothing on a fabric to be cut with respect to a theoretical grid (dashed lines) and an effective grid (continuous line), according to the invention;
- figure 4 shows a detail of figure 3, in particular an enlargement of the boxed part indicated with dashed lines in figure 3;
- figure 5 shows an adaptation between the theoretical positioning and the actual positioning of the components of the item of clothing, according to the invention;
- figure 6 shows a detail of figure 5, in particular an enlargement of the boxed part indicated with dashed lines in figure 5, according to the invention;
- figure 6 shows a real positioning of the components of the item of clothing on the fabric to be cut, accord-

ing to the invention;

- figure 7 shows a fabric cutting step simultaneously with a scanning step of a subsequent fabric to be cut;
- figure 7A shows the reference parameters of the operations shown in figure 7;
- figure 8 shows a fabric cutting step simultaneously with a processing step of effective positioning data of a subsequent fabric to be cut;
- figure 8A shows the reference parameters of the operations shown in figure 8.
- figures 9 and 10 show details of pitch adjustments of a real checked pattern present on the fabric to be cut;
- figure 11 is a schematic view of the apparatus 1 divided into several zones arranged for the operations envisaged according to the invention.

Detailed description of preferred embodiments of the invention

[0046] The invention describes an apparatus arranged for the detection and cutting of pieces of fabric needed to make an item of clothing from a predefined target model.

[0047] The invention provides a continuous automatic detection of the fabric and of the striped and/or checked pattern reproduced on the same, while simultaneously the cutting of a fabric occurs, previously detected, and already processed in terms of actual positioning with respect to a predefined target model.

[0048] In the following, where not otherwise indicated, the term "pattern" shall be intended as a striped and/or checked pattern, according to the present invention.

[0049] With reference to figures 1A and 1B, an apparatus 1 is provided for the continuous cutting of a fabric tes_i (i=1..n) for making items of clothing Ci (i=1..n).

[0050] With reference to figures 1A and 1B and 8, the apparatus 1 for the continuous cutting comprises a loading area A1, a cutting area A2, and an unloading area A3.

[0051] The loading area A1 is arranged for loading the fabric Tes_i so that it is detected.

[0052] The fabric Tes_i bears the theoretical pattern Tex_i established on the basis of a target model Mod_T_i.

[0053] The fabric tes_i is moved through the apparatus 1 in an advancement direction Dir away from the loading area A1.

[0054] The fabric tes_i, according to the invention, is cut on the basis of the predefined target model Mod_T_i (fig.2 and fig. 2A), made according to specific criteria.

[0055] As shown in figure 2, the target model Mod_T_i comprises theoretical points P0_i (i=1..n) representative of a predefined theoretical striped and/or checked pattern Tex_i reproduced on component parts Cij (i=1..n,j=1..n) of items of clothing Ci which will be made with the fabric tes_i.

[0056] In particular, an item of clothing C1 can be composed of component parts C11, C12, C13, etc. and made with the fabric Tes_1 on the basis of a target model Mod_T_1.

[0057] Preferably, the theoretical points P0_i are in reference to the cutting area A2; in particular, the positioning of the theoretical points P0_i is in reference to a theoretical grid GTiXY, at least partially relative to the cutting area A2; the target model Mod_T_i and the corresponding theoretical reference grid GTiXY are shown in figure 2 and 2A.

[0058] In particular, the height of the theoretical grid GTiXY is limited by the height of the cutting area, i.e. by the dimension of the cutting area along a direction perpendicular to an advancement direction Dir, while the length of the theoretical grid, i.e. the dimension of the theoretical grid along a direction parallel to the advancement direction Dir, can be greater than the corresponding dimension of the cutting area, limited only by the maximum scan length.

[0059] Very briefly, the theoretical grid GTiXY is configured to define a first theoretical positioning (with a pitch P0XY very similar to the real pitch) of the component pieces of the clothing to make.

[0060] In some embodiments, two theoretical grids are also provided and, more generally, a plurality of theoretical grids, according to a possible combination of patterns to be represented.

[0061] Preferably, the theoretical points P0_i are representative of theoretical meeting points between the component parts Cij of the item of clothing Ci.

[0062] The size of the frame of the theoretical grid GTiXY is called the pitch P0XY of the theoretical model Mod_T_i.

[0063] According to the invention, the theoretical points P0_i contain information INFk (k=1..n) representative of positionings of the component parts Cij and/or relationships between the component parts Cij for a composition of the item of clothing Ci.

[0064] The items of information INFk comprise at least one spatial relation INF1 of a component part Cij with the fabric tes_i (i=1..n) in the cutting area A2.

[0065] In other words, a theoretical point P0_i can give the spatial relationship with the fabric, i.e. for example it can be representative of an alignment with a horizontal/vertical stripe of the fabric, in order to, for example, have the component part comprising the point have a stripe in a predefined position, such as in the centre.

[0066] In figure 2 and 2A, a theoretical point P0_i corresponds, for example at point 106 which is a reference point that has a relationship with the fabric, in particular with the line L_106 that indicates, for example, a centre line of a component part Cij of the item of clothing Ci.

[0067] Alternatively or in addition, the items of information INFk comprise a cross-reference INF2 of a component part Cij with another component part Cij in the cutting area A2.

[0068] In figure 2 and 2A, the theoretical point P0_i corresponds, for example, to points 102 and 101O.

[0069] In particular, the points 102, 101O are a pair of points in which the point 102 transfers a rule to the point

101O, for example a predefined distance from one horizontal line of a corresponding component part. In particular, in figure 2A the relationships are graphically shown between different theoretical points P0_i; for example, a first relation segment R1 identifies the relationship between the pair of points 102 and 101O, while a second relation segment R2 identifies the relationship between another pair of points 602 and 604.

[0070] In other words, a point in a first component part which has a precise relationship with the theoretical pattern Tex_i can transfer its relationship to a second component part, through another point in the second component part; for example, points on two homologous sleeves of an item of clothing can move the "relationships" with respect to the theoretical pattern Tex_i to a component part representing the central part of an item of clothing.

[0071] Purely by way of example, the component part in figure 2 and 2A which comprises the line L_106 is the back of a shirt.

[0072] Still in other words, a point on a component part Cij can transfer a rule of composition of the item of clothing Ci to another component part Cij, determining a "strategy" of the composition of the item of clothing Ci starting from the component parts Cij.

[0073] The two items of information INF1,INF2 therefore define a rule of composition of the item of clothing Ci to be made with the component parts Cij.

[0074] In summary, the theoretical points P0_i are points that guide the alignment of the component parts Cij in order to determine an exact composition of the item of clothing Ci and an exact continuity of the theoretical pattern Tex_i in the entire item of clothing Ci.

[0075] The rules INFk ensure that there is continuity in the pattern of the theoretical model, which must be transmitted to the effective pattern detected on the real fabric Tes_i.

[0076] The application of the theoretical model to the effective detection of the fabric ensures that the fabric that will be made starting from the effective model will be made in an optimal way, in terms of composition of the component parts.

[0077] A further technical effect achieved by the application of the theoretical model on the real fabric, according to the invention, is also the reproduction of the theoretical pattern with an exact continuity on the real fabric.

[0078] The theoretical points P0_i as represented in figure 2 are arranged by a suitable automatic positioning program that, starting from an item of clothing provided with a theoretical pattern to be made, provides

- a corresponding spatial distribution of the fabric on the cutting surface, i.e. the spatial distribution on such surface of the component parts of the garment, and
- corresponding assembly rules of said item of clothing with the component parts so that the continuity of the theoretical pattern is respected.

[0079] Thus the theoretical meeting points are defined so as to allow connecting the component parts to each other to give continuity to the pattern.

[0080] Preferably, the fabric tes_i bears a predefined real pattern TexR_i (i=1..n).

[0081] The indication Tes_i (i=1..n) indicates that a multiplicity of fabrics Tes_1, Tes_2, Tes_3, etc. can be provided for the interaction with the apparatus 1; the same reasoning applies to the items of clothing Ci (i=1..n), and the real pattern TexR_i; a fabric Tes_i with a real pattern TexR_i, is used to make an item of clothing Ci.

[0082] Alternatively, a single fabric Tes_i can be used for the interaction with the apparatus 1.

[0083] In the following, the simple notation Tes_i, TexR_i and Ci will be used.

[0084] With reference to figures 1A and 1B and 8 and 11, the apparatus 1 for the continuous cutting comprises a loading area A1, a cutting area A2, and an unloading area A3.

[0085] The loading area A1 is arranged for loading the fabric Tes_i so that it is detected.

[0086] The fabric Tes_i bears the real pattern TexR_i established by the target model Mod_T_i.

[0087] Appropriate loading means 60 are arranged to load the fabric Tes_i in the loading area A1; preferably, the loading means 60 comprises a fabric spreader roll.

[0088] Preferably, upstream of the loading means 60, the continuous cutting apparatus 1 comprises an apparatus 80 for changing fabrics.

[0089] The apparatus 80 for changing fabrics is arranged to remove an empty roll, i.e. a roll from which the fabric has already been unloaded towards the loading means 60, and to load a new roll so that there is no interruption in the continuous detection and cutting cycle.

[0090] The technical effect obtained is the continuous operation of the apparatus 1 even in the case in which, at a given instant, a loaded roll of fabric is finished and it is necessary to load a subsequent roll.

[0091] The apparatus 1 comprises a movement means 10 arranged for moving the fabric tes_i.

[0092] In one preferred embodiment of the invention, the movement means 10 is arranged to move the fabric tes_i away from the loading area A1 in an advancement direction Dir, towards the cutting area A2, arranged downstream of the loading area A1.

[0093] Preferably, the movement means 10 comprises a conveyor belt.

[0094] The apparatus 1 comprises detection means 20 arranged to detect from the fabric tes_i effective points P1_i (i=1..n) representative of meeting points detected in the real pattern TexR_i of the fabric Tes_i coming from the loading area A1.

[0095] The set of effective points P1_i (i=1..n) determines an effective grid GRiXY of the fabric tes_i detected.

[0096] The detection means 20 has the purpose of detecting the real positioning of the fabric Tes_i in the loading area A1.

[0097] According to the invention, the detection means 20 is arranged in the loading area A1.

[0098] Preferably, the detection means 20 is fixed in the advancement direction DIR and possibly movable in a direction transverse to the advancement direction.

[0099] According to the invention, the detection means 20 is arranged at the inlet to the loading area A1 so that the detection of the fabric Tes_i at the inlet and the positioning of the fabric takes place without delay, so as to make the apparatus of the invention as efficient as possible.

[0100] Preferably, the detection means 20 comprises a scanner.

[0101] In other words, although the real pattern TexR_i of the fabric in conformity with the target model Mod_T_i and with reference to a theoretical grid GTiXY has been determined in advance, it is normal that the fabric Tes_i at the inlet to the loading area is not exactly aligned with the theoretical grid GTiXY, as it can be slightly inclined or partially folded/raised or wrinkled.

[0102] In particular, in figure 3 and in more detail in figure 4, both the theoretical grid GTiXY and the effective grid GRiXY are shown; the theoretical grid GTiXY is represented with dashed lines, while the effective grid GRiXY is represented with continuous lines; as can easily be seen, the two grids are slightly offset, as stated above.

[0103] The real positioning of the fabric and of the real pattern TexR_i in reference to the theoretical grid GTiXY is detected by the detection means 20 and constitutes an input for a subsequent processing that precedes the step of cutting the fabric in the component parts Cij of the item of clothing Ci.

[0104] According to the invention, the detection means 20 is further arranged to detect on the fabric Tes_i defect indicators D1_id,D2_id representative of non-conforming areas of fabric, hence determining corresponding defect points D1xy,D2xy.

[0105] This detection is also carried out at the inlet to the loading area A1 so as to make the operation of the apparatus of the invention as efficient as possible.

[0106] Preferably, the defect indicators D1_id (fig. 8) comprise round defect stamps that indicate a single defect, such as, for example, a run/breakage in the fabric or an area stained during dyeing.

[0107] Alternatively or in addition, the defect indicators D2_id comprise square defect stamps that indicate the beginning and end of a defective line, i.e. of a line with damaged fabric or fabric with an irregular pattern.

[0108] The fabrics Tes_i that are not marked with stamps can regardless be deformed or staggered with respect to the target model Mod_T_i.

[0109] Preferably, with reference to figure 1A, the apparatus 1 of the invention comprises a device for off-line viewing 90.

[0110] This device is arranged to parametrize the fabrics Tes_i before the continuous cutting.

[0111] Preferably, the device performs the parametrization only once for each piece of fabric, generating parameters P_check_i representative of the characteristics of the fabric (useful height of the fabric, pitch in the direction X, pitch in the direction Y, the gain of the camera that takes a photo of the fabric and the exposure of the camera that takes the photo of the fabric, markers, etc.).

[0112] The technical effect ensured by the off-line viewing device 90 is a parametrization of the fabric Tes_i before the start of the cutting in order to then ensure the continuous cutting.

[0113] In other words, the off-line detection of the fabric allows saving the information on the fabric Tes_i once in a database DB_check, associating it to an identifier ID_Tes_i of the controlled fabric, and thereby ensures that the fabric can be cut continuously without there being a further need to detect this information.

[0114] Preferably, the off-line viewing device 9 is installed on an external apparatus for quality control.

[0115] Alternatively, in the absence of the external control apparatus, the off-line viewing device 90 is coupled to the detection means 20 and the parameters P_check_i representative of the fabrics will be detected directly on the apparatus of the invention, before the beginning of the cutting operations, to take advantage of these parameters in the next cutting operation.

[0116] As described, when the apparatus is in operation, the detection means 20 is arranged to receive the fabric control parameters P_check with the identifier ID_Tes_i from the off-line viewing device 90.

[0117] The technical effect achieved is a further speeding up of the loading process of the fabric at the inlet, which further contributes to the continuous operation of the apparatus.

[0118] Continuing away from the loading area A1 and the detection means 20, advancing in the advancement direction Dir, the apparatus 1 for continuous cutting comprises a cutting head 30 (fig.1A and 1B).

[0119] The cutting head 30 is associated with the cutting area A2, and arranged to cut the fabric Tes_i that has been previously received in the cutting area A2.

[0120] Preferably, the apparatus 1 comprises a two-dimensional continuous cutting guide 50 (fig.1A and 1B) that supports said cutting head 30.

[0121] According to the invention, the two-dimensional guide 50 is arranged to translate the cutting head 30 in the cutting area A2 along two directions Dir_X, Dir_Y perpendicular to each other.

[0122] Preferably, the first direction Dir_X is parallel to the advancement direction Dir, while the second direction Dir_Y is perpendicular to the advancement direction Dir.

[0123] With particular reference to figure 11,

- the loading area A1 substantially coincides with the area of the apparatus that extends along the direction Dir_X downstream of the loading means 60 until the beginning of the two-dimensional guide 50;
- the cutting area A2 substantially coincides with the area of the apparatus underlying the two-dimensional guide 50 in its movements;

- the unloading area A3 substantially coincides with the area of the apparatus extending along the direction Dir_X downstream of the two-dimensional guide 50.

[0124] The apparatus 1 for continuous cutting further comprises a processing unit 40 (fig. 1A and 1B) configured to process the effective points P1_i detected and/or theoretical points P0_i established by the target model Mod_T_i.

[0125] The processing unit 40 is logically divided into distinct functional modules (storage modules or operating modules) that perform the described functions.

[0126] This processing unit 40 can comprise a single electronic device, appropriately programmed to perform the functionalities described, and the different modules can correspond to hardware entities and/or software routines that are part of the programmed device.

[0127] Alternatively or additionally, these functions can be performed by a plurality of electronic devices on which the aforesaid functional modules can be distributed.

[0128] The processing unit 40 can also make use of one or more processors for executing the instructions contained in the storage modules.

[0129] The aforementioned functional modules can also be distributed on different local or remote computers, depending on the architecture of the network in which they reside.

[0130] The processing unit 40 according to the invention is configured to receive the effective points P1_i detected, make a comparison by points between the theoretical P0_i and effective points P1_i and determine the real meeting points PR_i (i=1..n) of the real pattern TexR_i in the component parts Cij according to the comparison by points.

[0131] Advantageously, the comparison by points between the theoretical points P0_i and effective points P1_i is carried out by the processing unit according to the following steps:

- assessing the correspondence of the theoretical points P0_i on a theoretical grid of the cutting area A2 with the corresponding effective points P1_i detected on the fabric Tes_i;
- in the event of lack of correspondence, moving the theoretical points P0_i so that they coincide with the effective points P1_i in order to allow the subsequent cutting of the component parts Ci in conformity with the real fabric Tes_i received.

[0132] In particular, as already explained, the theoretical points P0_i are in reference to a theoretical grid GTiXY, while the effective points P1_i are in reference to an effective grid GRiXY.

[0133] In other words, the processing of the invention provides for reproducing on the effective grid the positioning of the theoretical points with respect to the theoretical grid.

[0134] For example, if a theoretical point lies at the intersection of two lines of the theoretical grid, this point will be reproduced at the corresponding intersection of the two corresponding effective lines.

[0135] For example, if a theoretical point lies halfway between two parallel lines of the theoretical grid, this point will be reproduced halfway between the two corresponding effective lines.

[0136] The technical effect achieved is an adaptation of the theoretical model to the characteristics of the actual fabric detected.

[0137] Another technical effect is that the cutting of the component parts Cij takes place in conformity with the real fabric tes_i received, i.e. on the effective characteristics of the fabric made starting from the theoretical Target model.

[0138] In this way the advantage of the precise arrangement of a model to be made is combined with the advantage of a precise cut on the fabric effectively received.

[0139] In general, the effective points P1_i (i=1..n) almost never coincide exactly with the theoretical points P0_i;

Figure 5 shows the case in which the theoretical model has been adapted to the characteristics of the real fabric according to what has just been described; in particular, certain component parts can be seen in the figure whose edges do not coincide and that, therefore, require the adaptation provided by the invention described.

[0140] Figure 5 shows a detail of figure 4 in which the points 106 and 107 are adapted with a shift from the centre of the respective numbered crosses (theoretical points) towards the left in the centre of the other crosses shown (effective points).

[0141] The processing unit (40) is further configured to process the defect points D1xy,D2xy.

[0142] In particular, the processing unit 40 is configured to process the defect points D1xy,D2xy through the steps of:

- receiving the defect points D1xy,D2xy from the detection means (20);
- performing a comparison by defects between the theoretical points P0_i and the defect points D1xy, D2xy;
- determining the real meeting points PR_i (i=1..n) of the real pattern TexR_i in the component parts Cij according to the comparison by defects.

[0143] The processing unit (40) is configured to process the effective points P1_i and/or theoretical points P0_i and/or defect points D1xy,D2xy while the fabric Tes_i is transported from the loading area A1 to the cutting area A2.

[0144] The technical effect achieved is that the operations take place continuously, avoiding the creation of downtime between one and the other

[0145] For example, with reference to figure 8, the cutting head 30 is configured to cut a first fabric Tes_i (i=j) in the cutting area A2 simultaneously with the processing by the processing unit 40, of the effective P1_i and/or theoretical points P0_i of a second fabric Tes_i; (I=j+1).

[0146] Figure 8A shows the reference parameters of the operations shown in figure 8.

[0147] Alternatively or in addition, simultaneously with the above processing, the detection means 20 detects a third fabric Tes_i (i=j+2) in the loading area A1, as shown in figure 7.

[0148] Figure 7A shows the reference parameters of the operations shown in figure 7.

[0149] Figure 11 shows together, and operatively simultaneously, the scanning, processing and cutting operations on different fabrics loaded in succession in the apparatus of the invention.

[0150] Once again, the operations take place continuously, avoiding the creation of downtime between one and the other.

[0151] In this way a continuous cycle of detection, processing and cutting is determined.

[0152] Consequently, also an unloading of the component parts, implemented in the third area A3 of the apparatus 1, is simultaneous with one or more of the operations described.

[0153] According to the invention, the cutting head 30 is configured to cut the fabric Tes_i in the cutting area A2 according to the real meeting points PR_i determined.

[0154] The technical effect obtained is an exact continuity of the pattern, also with fabric loaded crooked or warped or with a defective or irregular pattern.

[0155] According to the invention, the processing unit 40 is further configured to transmit the real meeting points PR_i (i=1..n) to the two-dimensional guide 50 so that the two-dimensional guide 50 guides the cutting head 30 to cut the fabric Tes_i in the cutting area A2 according to the real meeting points PR_i determined.

[0156] In particular, as described, the meeting points PR_i were obtained through a detailed comparison between theoretical and effective points and possibly through comparison by defects.

[0157] According to the invention, the detection means 20 is arranged to detect the effective points P1_i and/or the defect indicators D1_id,D2_id on the fabric tes_i arranged in the loading area A1.

[0158] The fabric Tes_i will have a real pattern TexR_i equal to that of the target model Mod_T_i, but it can have a different effective pitch PRxy.

[0159] Preferably, the effective detection pitch PRxy is pre-set starting from the frequency of the stripe or check on the fabric Tes_i to detect.

[0160] In particular, the pitch is the distance between two equal, immediately successive design parts in the real pattern of the fabric tes_i.

[0161] Although the real pattern TexR_i is equal to that of the target model Mod_T_i, the distances between the stripes/checks can be different from those of the Target model Mod_T_i.

[0162] In fact, the target model can be used for different items of clothing Ci with the same real pattern TexR_i, but with a different pitch Pxy, since, regardless of the pitch of the fabric, the meeting points of the model still remain the same because they ensure the continuity of the pattern on each fabric.

[0163] Thus, in an optimal processing situation, the processing unit 40 is configured to set the detection of the effective points P1_i and/or the defect indicators D1_id,D2_id according to:

- the theoretical pattern Tex_i of the fabric tes_i defined in the target model Mod_T_i;
- an effective pitch PRxy for the fabric tes_i at the inlet to the loading area A1.

[0164] With reference to Figure 9 a real pattern of the fabric tes_i detected by the detection means 20 is shown, in which the markers that identify the checks are centred on the intersections between the lines of the checks; in this case, therefore, the effective pitch PRxy is substantially regular, that is, the distances x and y from the centre of the marker at the ends of the check along the x and y axes are constant.

[0165] A fabric tes_i can be loaded in the loading area having a different effective pitch PRxy due to imperfections in the fabric and/or in the positioning; an example is shown in figure 10.

[0166] In this case, the detection means 20 detects a different effective detection pitch PRxy, since the markers are no longer centred in the checks of the real pattern and the distances x and y vary accordingly, resulting irregular.

[0167] The processing unit 40 is configured to detect a new effective pitch PRxy by detecting subsequent measurements of the effective pitch PRxy and changing the effective pitch with the new pitch value, when the new pitch value is repeated a predefined number of times, for example 2.

[0168] In this way, the apparatus adapts to the variable pitch of the fabric tes_i due to various causes, such as irregular printing of the pattern, and/or effective positioning the fabric.

[0169] The technical effect achieved is greater efficiency in the preparation of the component parts Cij that will be cut in the cutting step, thanks to the "refinement" of the effective pitch of the pattern actually present on the fabric tes_i to be cut.

[0170] A further technical effect is the maximisation of the number of fabric components which can be cut in the cutting area, reducing the amount of fabric scraps thanks to the precise realisation in terms of real space occupied by the component parts.

[0171] In some embodiments of the invention, a console 70 is optionally provided (fig. 1A) which controls an additional precise pointing.

[0172] The cutting head 30 is coupled to a camera that covers the cutting area A2 and the fabric tes_i in the cutting area.

[0173] In some cases, since the detection of the fabric tes_i takes place in the loading area A1 and the cutting area can be several metres away, it may occur that the fabric tes_i moves slightly with respect to the position detected by the detection means.

[0174] In this case, after the component pieces have already been adapted, i.e. after the positioning of the theoretical points has been reproduced on the effective grid, and before cutting, the console allows performing a precise pointing, allowing the operator to define the exact position of an effective point P1_i on the fabric and make the appropriate adjustments in the position of the component pieces Cij.

[0175] The invention also provides a method actuated through a computer for the continuous detection and cutting of fabric tes_i (i=1..n) bearing a predefined real striped and/or checked pattern TexR_i (i=1..n) for making items of clothing Ci (i=1..n):

The method comprises the step of arranging a fabric (tes_i).

[0176] Preferably, this step comprises loading the fabric tes_i (i=1..n) in a loading area A1 of an apparatus 1 for cutting fabric tes_i to be detected and moving the fabric tes_i in an advancement direction Dir away from the loading area A1.

[0177] The method further provides the step of detecting from the fabric tes_i (i=1..n) at least effective points P1_i (i=1..n) representative of meeting points detected in the predefined real pattern TexR_i;

The method further provides for

- receiving, from a processing unit 40, the theoretical points P0_i (i=1..n), representative of a theoretical pattern Tex_i reproduced on component parts Cij (i=1..n,j=1..n) of the items of clothing Ci on a target model (Mod_T_i);
- receiving the effective points P1_i detected, representative of meeting points detected of the predefined real pattern TexR_i in the fabric tes_i detected;
- performing a comparison by points between the theoretical points P0_i and said effective points P1_i;
- determining real meeting points PR_i (i=1..n) of the component parts Cij at least according to the comparison by points;

cutting the fabric tes_i

according to the real meeting points PR_i determined.

[0178] Preferably, before the cutting operation, the fabric tes_i will be moved from a loading area A1 to a cutting area A2 in an advancement direction Dir. According to the invention, the cutting step is configured to cut a first fabric (tes_i;i=j) simultaneously with one or more of the following operations:

- processing, by the processing unit 40, effective P1_i and/or theoretical points P0_i of a second fabric tes_i (i=j+1) arranged subsequently to the first;
- detecting a third fabric tes_i (i=j+2) arranged subsequently to the first or the second.

[0179] According to the invention, the step of processing said effective P1_i and/or theoretical points P0_i is performed while said fabric (tes_i) is transported from a loading area A1 to a cutting area A2.

[0180] The invention further provides a computer program configured to perform one or more of the steps of the method described.

[0181] The invention described provides for an automatic continuous detection of fabric and the patterns reproduced on the same, while, simultaneously, the processing takes place of the information obtained from a previously detected fabric and/or, simultaneously, in a cutting area the cutting takes place of a previously detected fabric.

[0182] The different component parts made are prepared in conformity with a target model so that their composition determines an item of clothing with a precise alignment between stripes and checks.

[0183] The invention, as described, achieves the following technical effects:

- optimised cutting in terms of performance and efficiency of the apparatus involved;
- optimised cutting in terms of execution time;
- precise meeting of stripes/checks between the component parts of the item of clothing to make.

Claims

1. Apparatus (1) for the continuous detection and cutting of fabric (tes_i;i=1..n), bearing a predefined real striped and/or checked pattern (TexR_i;i=1 ..n) for making items of clothing (Ci;i=1..n), comprising:

a loading area (A1) for loading fabric (tes_i), into which said fabric is loaded for being detected;

a movement means (10) for moving said fabric (tes_i) away from said loading area (A1) in an advancement direction (Dir);

a detection means (20) arranged to detect from said fabric (tes_i) at least effective points (P1_i;i=1..n) representative of meeting points detected in said predefined real pattern (TexR_i), said detection means (20) being arranged in said loading area (A1);

a processing unit (40) for processing effective (P1_i) and/or theoretical points (P0_i;i=1..n) configured for:

- receiving said theoretical points P0_i (i=1..n), representative of a theoretical pattern (Tex_i) reproduced on component parts (Cij;i=1..n,j=1..n) of said items of clothing (Ci) on a theoretical target model

(Mod_T_i);

- receiving said effective points (P1_i) detected, representative of meeting points detected from said predefined real pattern (TexR_i) in said fabric (tes_i) detected;
- performing a comparison by points between said theoretical points (P0_i) and said effective points (P1_i);
- determining effective meeting points (PR_i:i=1..n) of said real pattern (TexR_i) in said component parts (Cij) at least according to said comparison by points;

a cutting area (A2) arranged downstream of said loading area (A1) with respect to said advancement direction (Dir);
a cutting head (30), associated with said cutting area (A2), and arranged to cut said fabric (tes_i), which has been received in said cutting area (A2) starting from said loading area (A1), according to said determined real meeting points (PR_i);
wherein said fabric (tes_i) has been received in said cutting area (A2) by means of a movement applied by said movement means (10) in said advancement direction (Dir).

2. The continuous detection and cutting apparatus (1) according to claim 1 wherein said processing unit (40) is configured to perform said comparison by points between said theoretical points (P0_i) and said effective points (P1_i) according to the following steps:

- assessing a correspondence of the theoretical points (P0_i) on a theoretical grid (GTiXY) at least partially relative to the cutting area (A2) with said effective points (P1_i) detected on said fabric (tes_i) in said loading area (A1);
- in the event of lack of correspondence, moving said theoretical points (P0_i) so that they coincide with the effective points (P1_i) in order to allow the subsequent cutting of said component parts (Ci) in conformity with the real fabric (Tes_i) received.

3. The continuous detection and cutting apparatus (1) according to claim 1 or 2 wherein said theoretical points (P0_i) contain information (INFk;k=1..n) representative of one or more from:

- a spatial relation (INF1) of a component part (Cij) with the fabric (tes_i;i=1..n) in said cutting area (A2);
- a cross reference (INF2) of a component part (Cij) with another component part (Cij) of the same item of clothing (Ci) in said cutting area (A2);

the two items of information (INF1,INF2) defining a rule of composition of the item of clothing (Ci) to be made with said component parts (Cij).

4. The continuous detection and cutting apparatus (1) according to any one of the preceding claims wherein said cutting head (30) is configured to cut a first fabric (tes_i;i=j) in said cutting area (A2) simultaneously with one or more of the following operations:

- said processing unit (40) processes said effective (P1_i) and/or theoretical points (P0_i) of a second fabric (tes_i; i=j+1);
- said detection means (20) detects a third fabric (tes_i; i=j+2) in said loading area (A1).

5. The continuous detection and cutting apparatus (1) according to any one of the preceding claims wherein said processing unit (40) is configured to process said effective (P1_i) and/or theoretical points (P0_i) while said fabric (tes_i) is transported from said loading area (A1) to said cutting area (A2).

6. The continuous detection and cutting apparatus (1) according to any one of the preceding claims wherein said detection means (20) is arranged to detect on said fabric (tes_i) defect indicators (D1_id,D2_id) representative of non-conforming areas of fabric (tes_i), hence determining corresponding defect points (D1xy,D2xy).

7. The continuous detection and cutting apparatus (1) according to claim 6 wherein said processing unit (40) is further configured to process said defect points (D1xy,D2xy).

8. The continuous detection and cutting apparatus (1) according to claim 7 wherein said processing unit (40) is configured to process said defect points (D1xy,D2xy) by means of:

- receiving said defect points (D1xy,D2xy) from said detection means (20);
- performing a comparison by defects between said theoretical points (P0_i) and said defect points (D1xy,D2xy);
- determining said real meeting points (PR_i:i=1..n) of the real pattern (TexR_i) in said component parts (Cij) also according to said comparison by defects.

9. The continuous detection and cutting apparatus (1) according to any one of the preceding claims comprising a two-dimensional guide (50) that supports said cutting head (30), and is arranged to make said cutting head (30) translate in said cutting area (A2) along two directions (Dir_X, Dir_Y) perpendicular to each other.

10. The continuous detection and cutting apparatus (1) according to claim 9, wherein the first direction (Dir_X) is parallel to the advancement direction (Dir), while the second direction (Dir_Y) is perpendicular to the advancement direction (Dir).

11. The continuous detection and cutting apparatus (1) according to any one of claims 9 or 10 wherein said processing unit (40) is configured to transmit said real meeting points (PR_i:i=1..n) to said two-dimensional guide (50) so that said two-dimensional guide (50) guides said cutting head (30) to cut said fabric (Tes_i) in said cutting area (A2) according to said real meeting points (PR_i).

12. The continuous detection and cutting apparatus (1) according to any one of the preceding claims wherein said processing unit (40) is configured to set the detection of said effective points (P1_i) and/or of said defect indicators (D1_id,D2_id) according to:

- said theoretical pattern (Tex_i) of said fabric (tes_i) defined in said target model (Mod_T_i;
- an effective pitch (PRxy) for the fabric (tes_i) at the inlet into the loading area A1.

13. The continuous detection and cutting apparatus (1) according to claim 12 wherein said processing unit (40) is configured to detect a new effective pitch (PRxy) by detecting subsequent measurements of the effective pitch (PRxy) and changing the effective pitch with the new pitch value, when the new pitch value is repeated a predefined number of times.

14. A method, actuated through a computer, for the continuous detection and cutting of fabric (tes_i;i=1..n), bearing a predefined real striped and/or checked pattern (TexR_i;i=1..n) for making items of clothing (Ci;i=1..n), comprising the steps of:

arranging a fabric (tes_i);
arranging a loading area (A1) for loading fabric (tes_i), wherein said fabric is loaded in order to be detected;
detecting from said fabric (tes_i;i=1..n), in said loading area (A1), at least effective points (P1_i;i=1..n) representative of meeting points detected in said predefined real pattern (TexR_i);
moving said fabric (tes_i) away from said loading area (A1) in an advancement direction (Dir);

- receiving from a processing unit (40) theoretical points (P0_i;i=1..n), representative of a theoretical pattern (Tex_i) reproduced on component parts (Cij;i=1..n,j=1..n) of said items of clothing (Ci) on a theoretical target model (Mod_T_i);
- receiving said effective points (P1_i) detected, representative of meeting points detected of said predefined real pattern (TexR_i) in said fabric (tes_i) detected;
- performing a comparison by points between said theoretical points (P0_i) and said effective points (P1_i);
- determining real meeting points (PR_i:i=1..n) of said component parts (Cij) at least according to said comparison by points;
- arranging a cutting area (A2) downstream of said loading area (A1) relative to said advancement direction (Dir);
- cutting said fabric (tes_i), in said cutting area (A2), according to said real meeting points (PR_i) determined.

15. The continuous detection and cutting method according to claim 14 wherein said cutting step is configured to cut, in said cutting area (A2), a first fabric (tes_i;i=j) simultaneously with one or more of the following operations:

- processing, by said processing unit 40, effective (P1_i) and/or theoretical points (P0_i) of a second fabric (tes_i; i=j+1) arranged subsequently to the first;
- detecting a third fabric (tes_i; i=j+2), arranged subsequently to the first or the second, in said loading area (A1).

16. The continuous detection and cutting method according to any one of claims 14 or 15 wherein the step of processing said effective (P1_i) and/or theoretical points (P0_i) is performed while said fabric (tes_i) is transported from a loading area (A1) to a cutting area (A2).

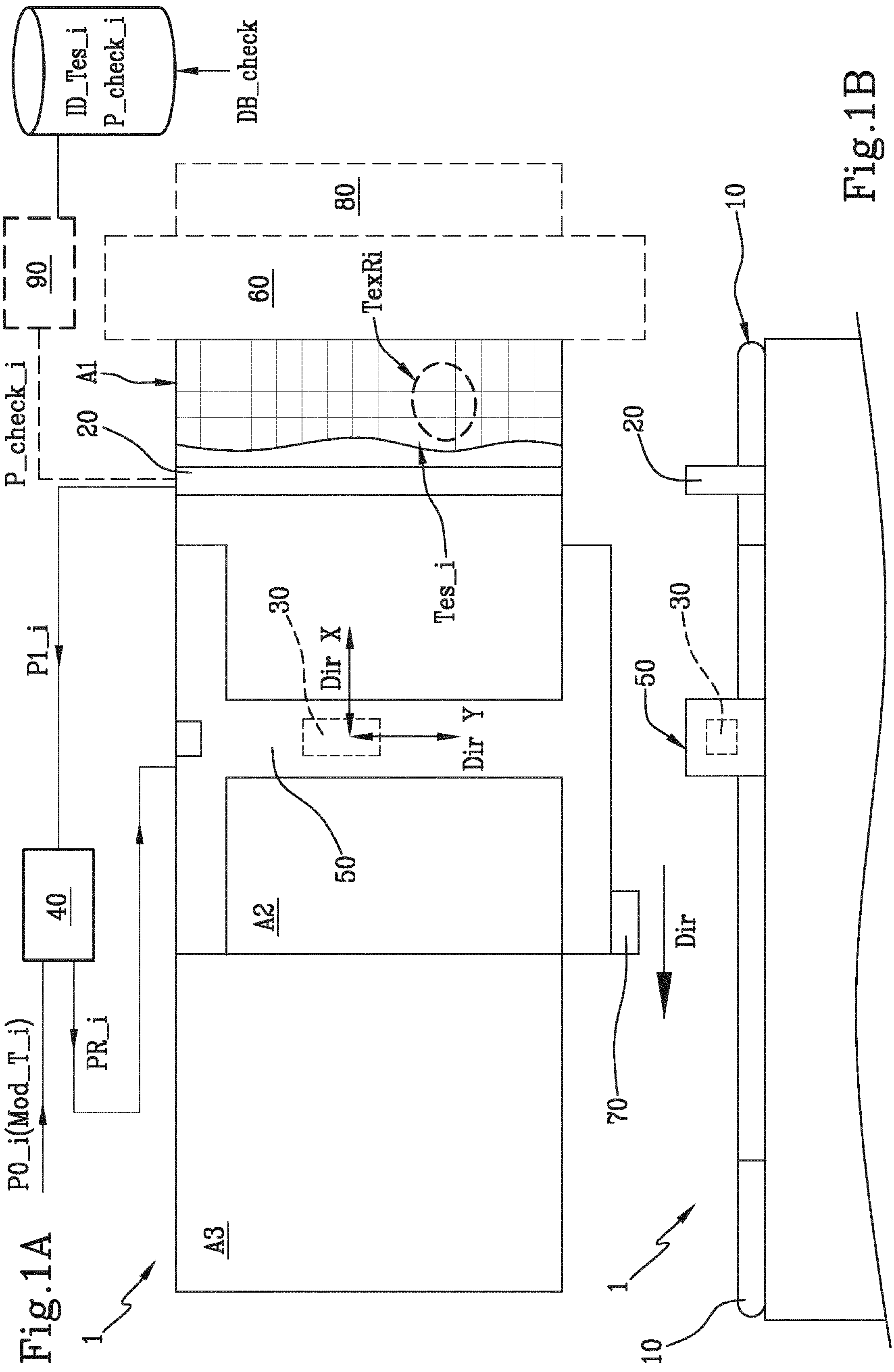

ID_Tes_i
P_check_i
DB_check
90
80
60
TexRi
P_check_i
A1
20
Tes_i
30
Dir X
Dir Y
P1_i
50
40
A2
Dir
PR_i
P0_i(Mod_T_i)
70
A3
1
10
20
30
50
30
1
10

Fig.1A

Fig.1B

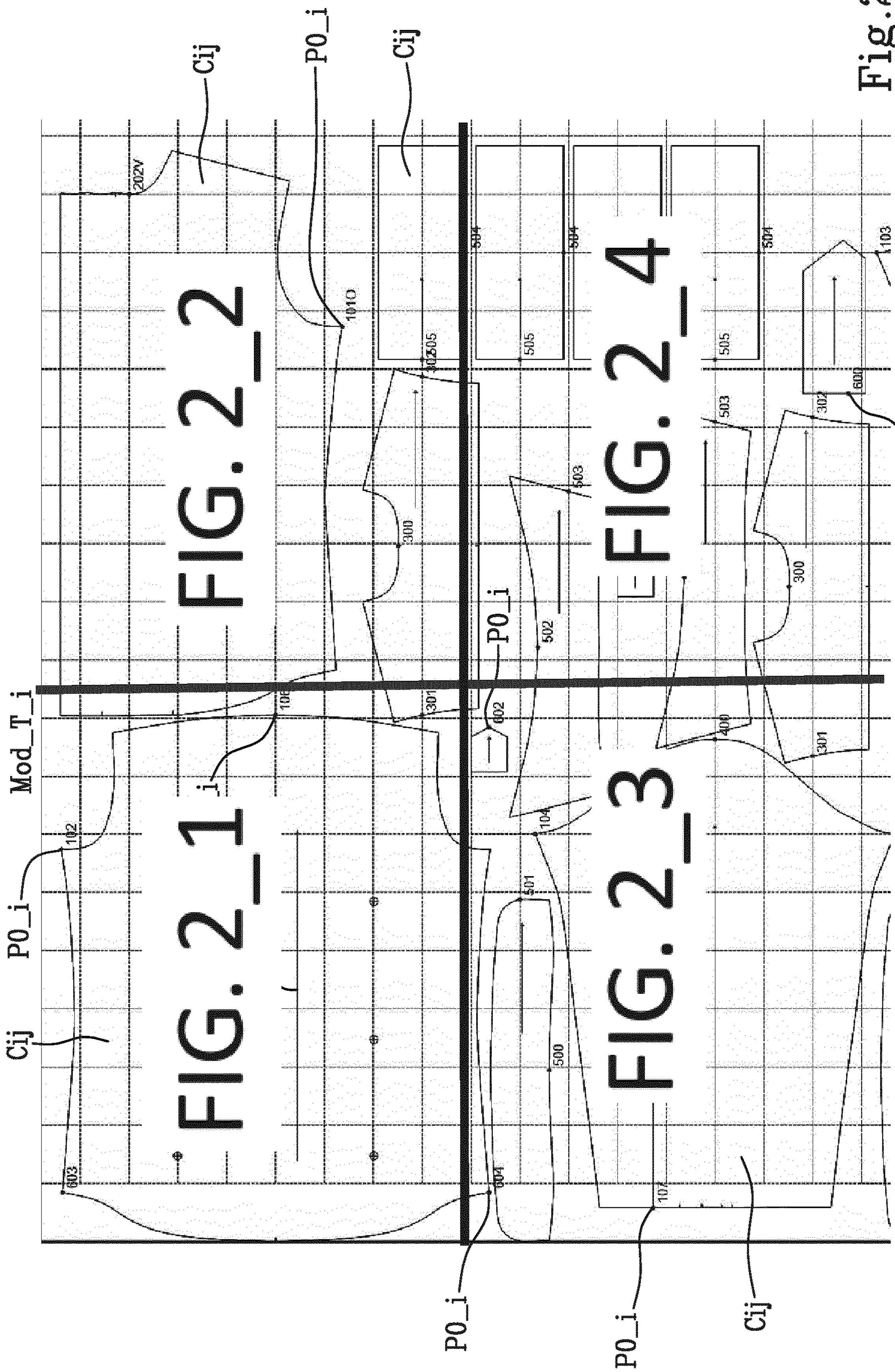


Fig.2

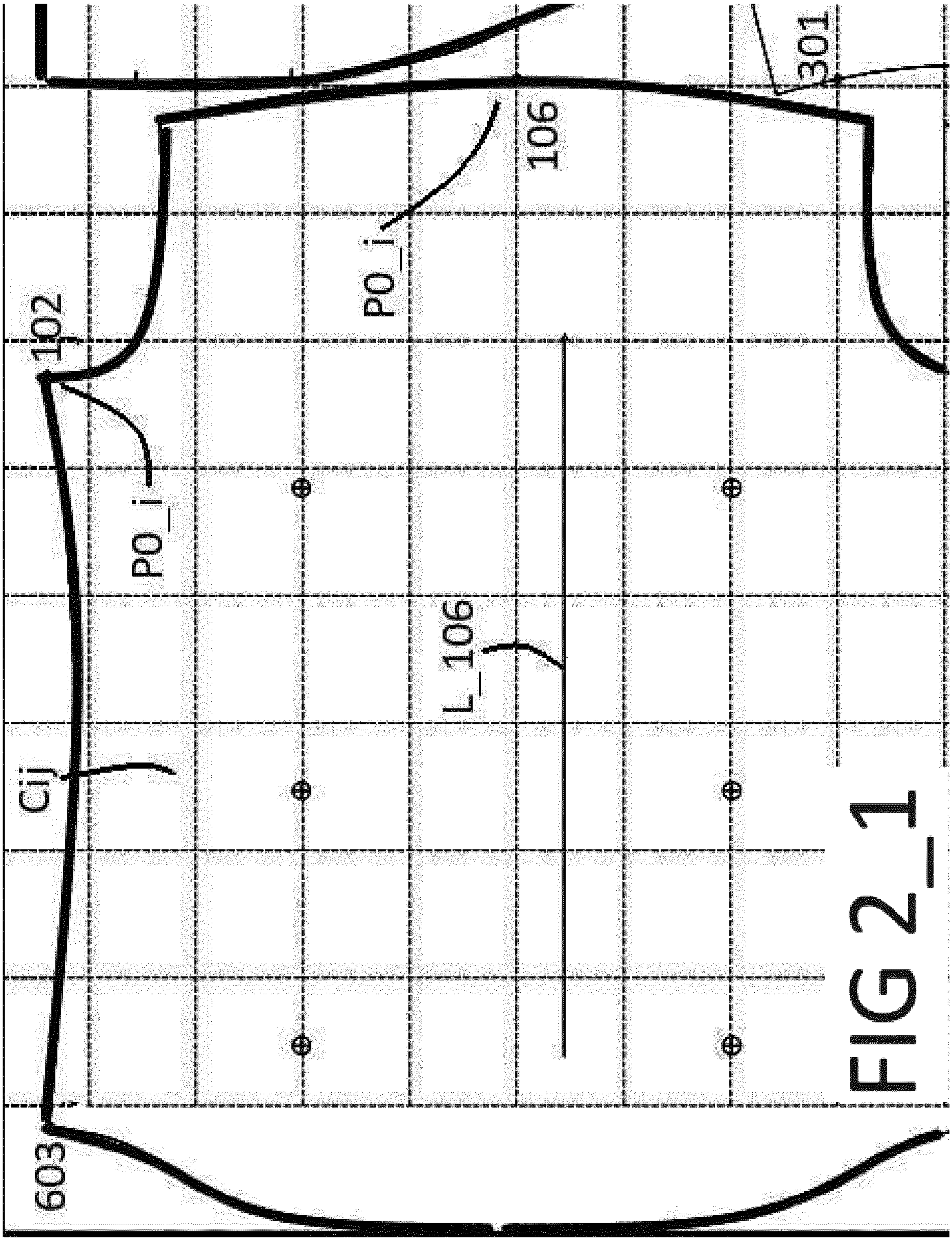


FIG 2_1

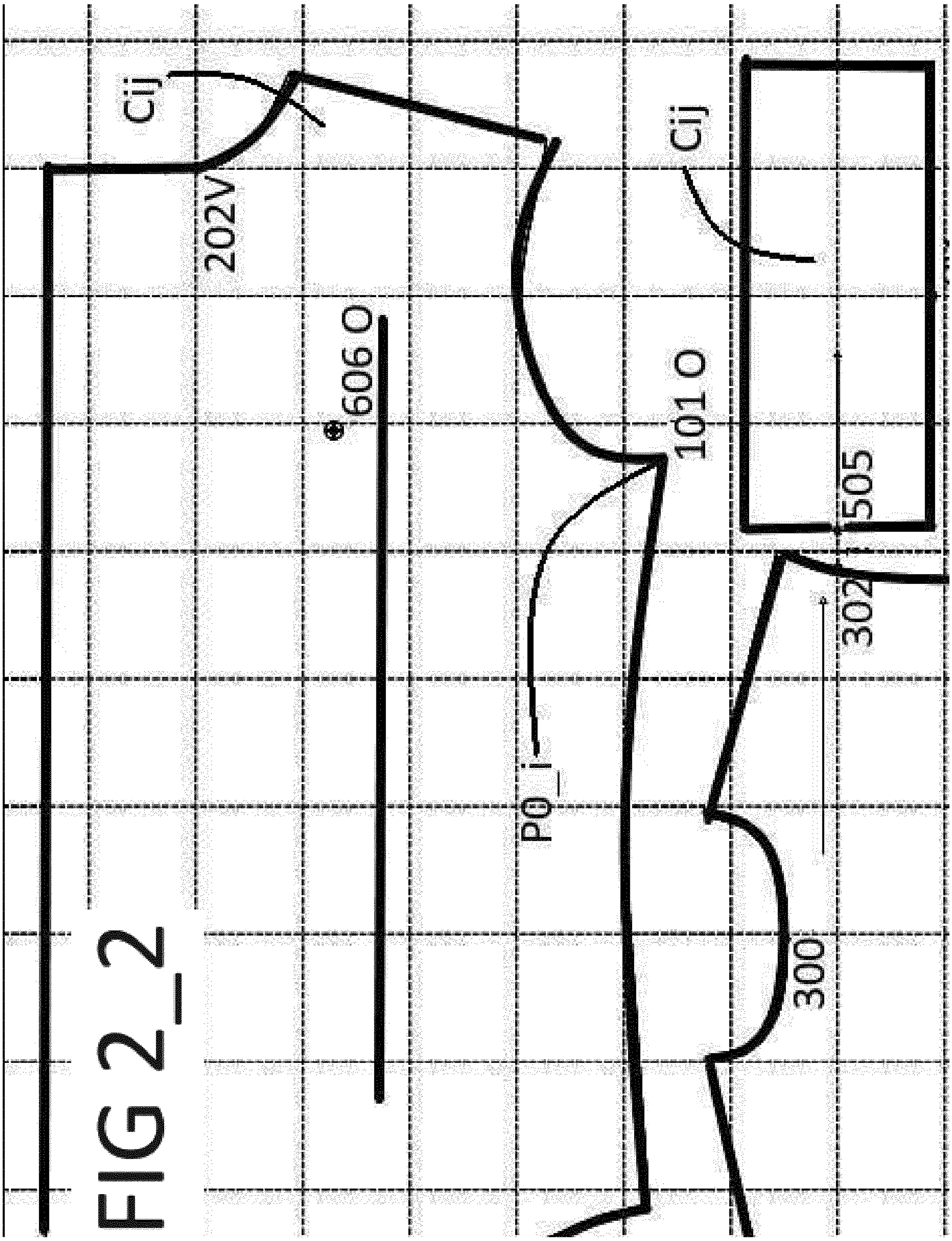


FIG 2_2

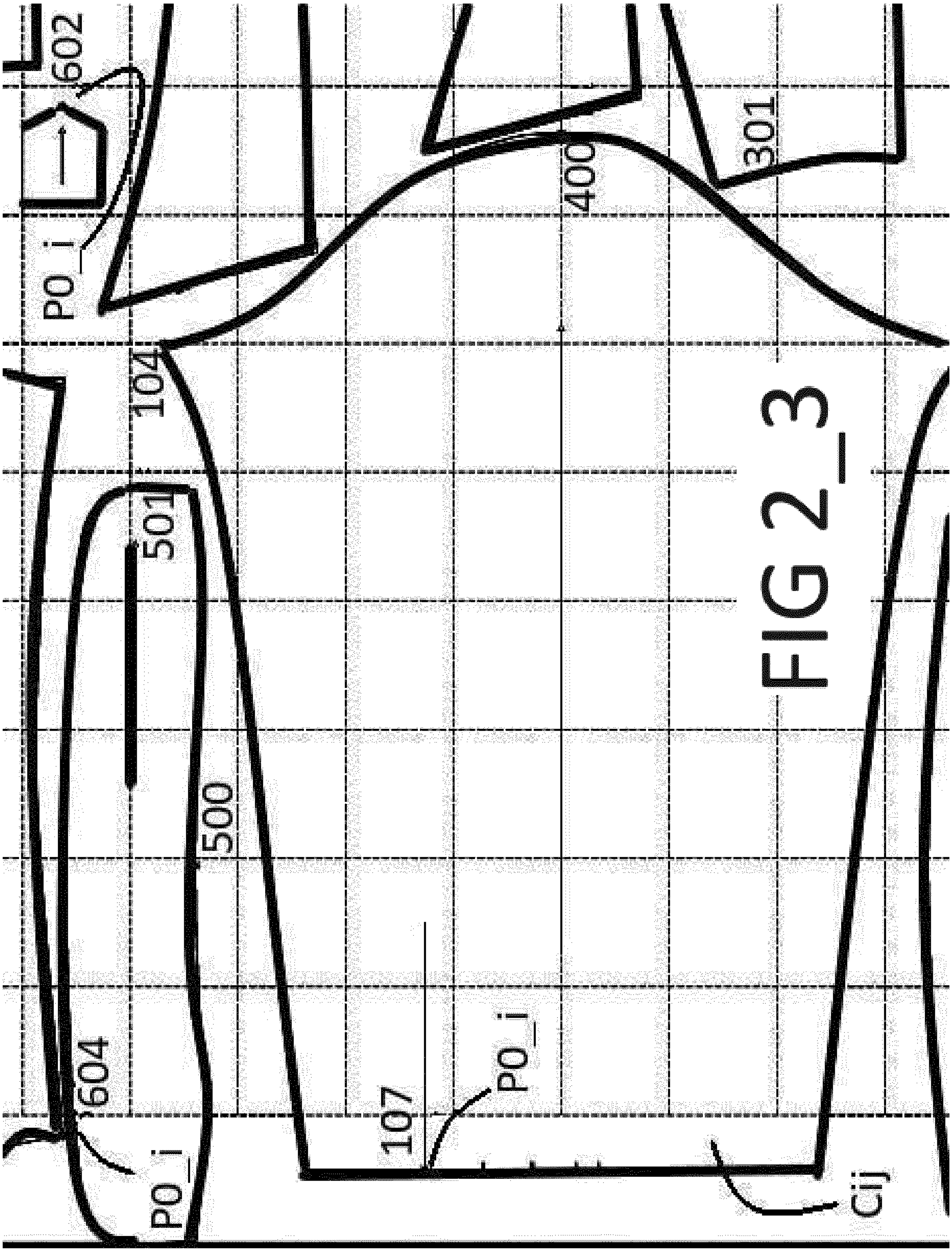


FIG 2_3

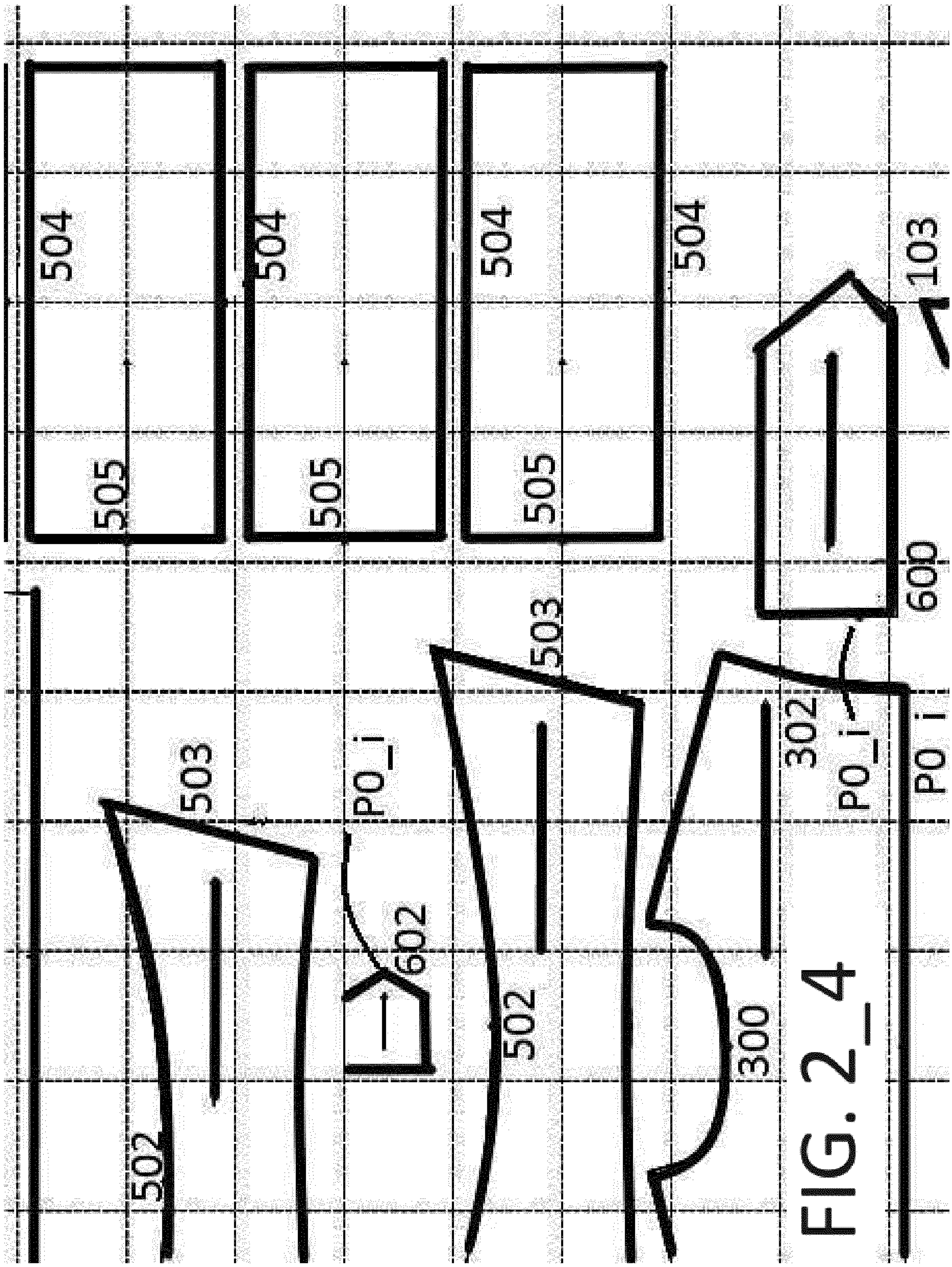


FIG. 2_4

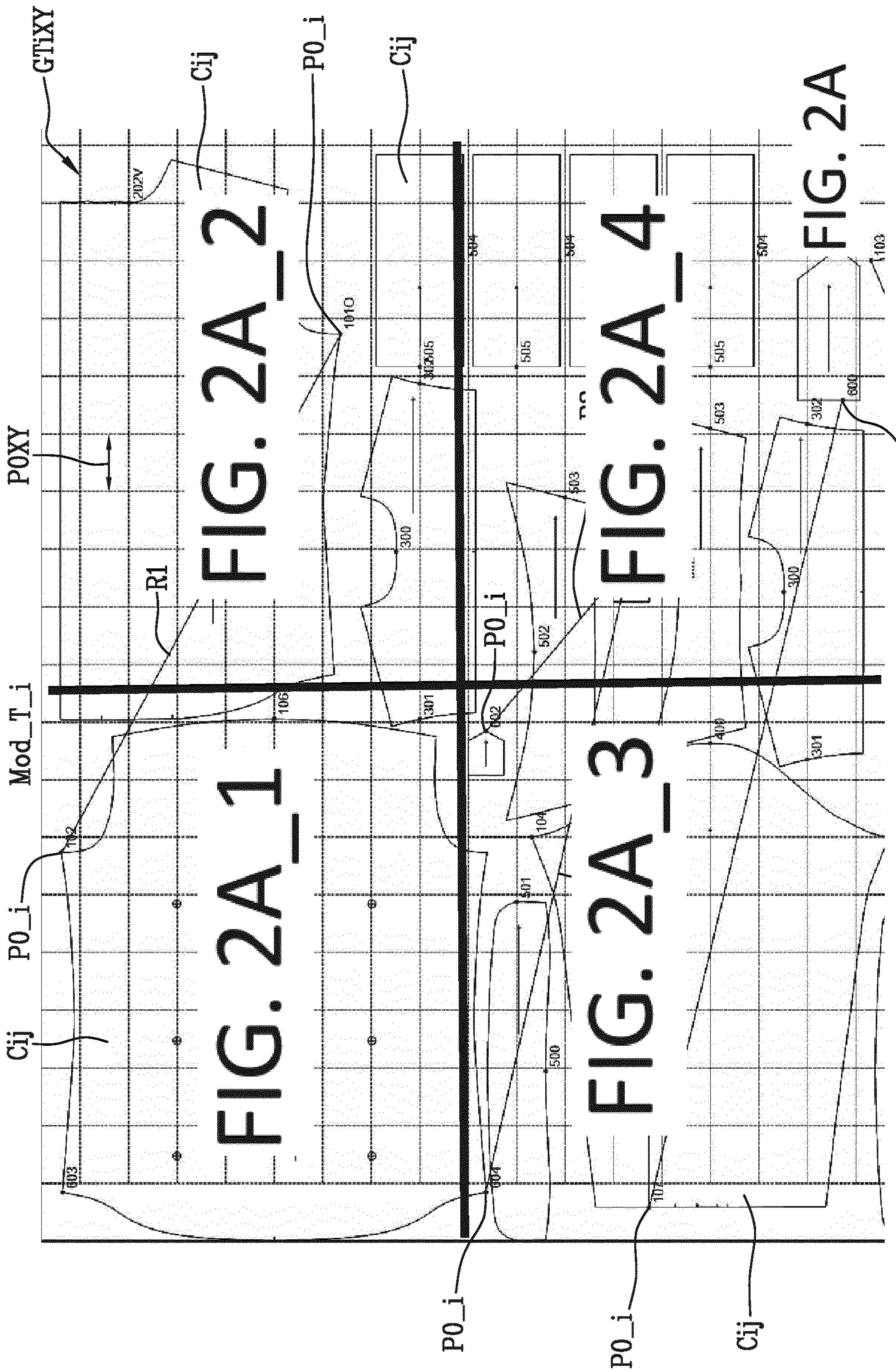

GTiXY
Cij
P0_i
Cij
P0XY
R1
Mod_T_i
P0_i
Cij
P0_i
P0_i
P0_i
Cij
P0_i
FIG. 2A_1
FIG. 2A_2
FIG. 2A_3
FIG. 2A_4
202V
101O
106
102
603
604
302
505
504
300
301
602
503
502
501
500
104
107
400
301
302
600
103

FIG. 2A

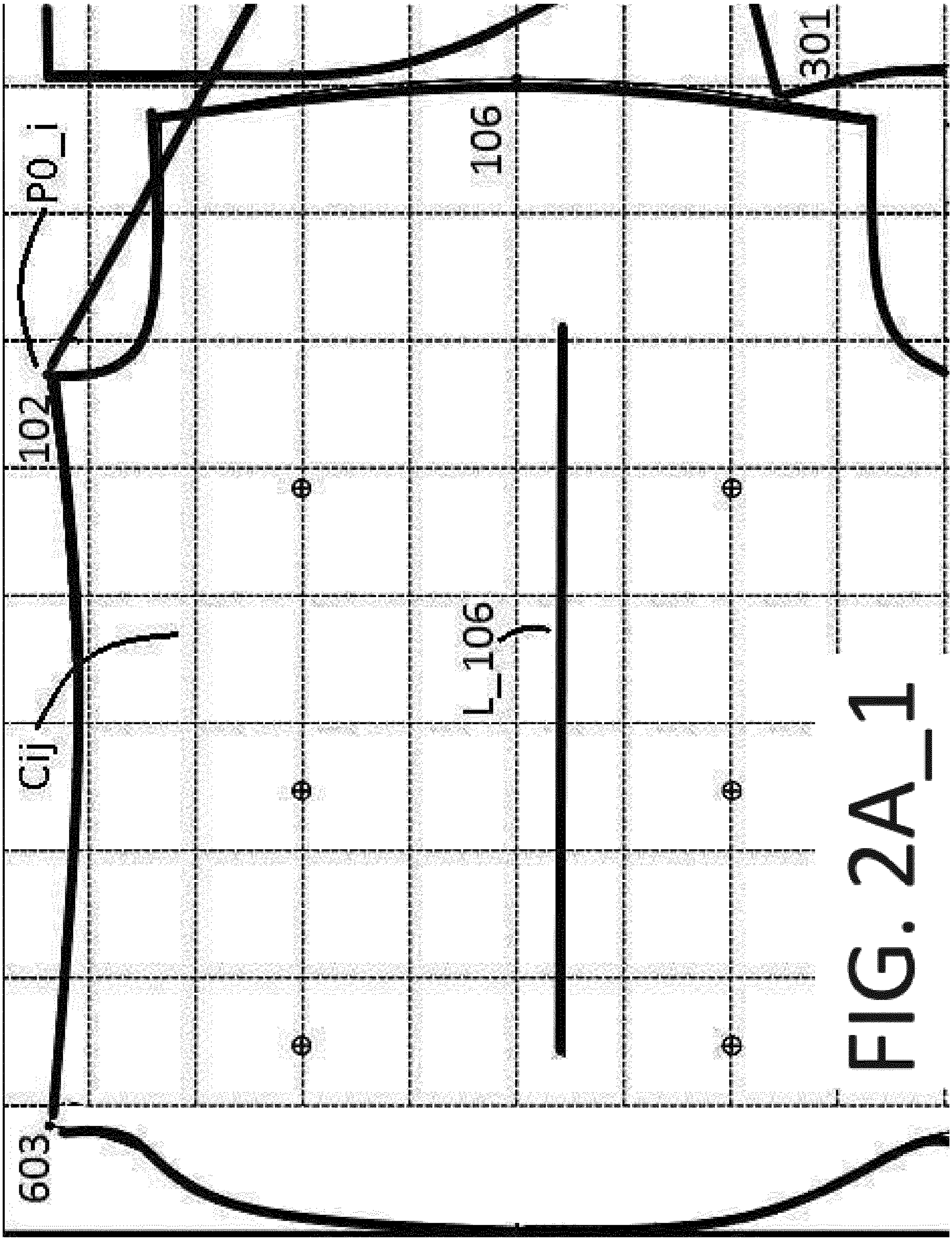


FIG. 2A_1

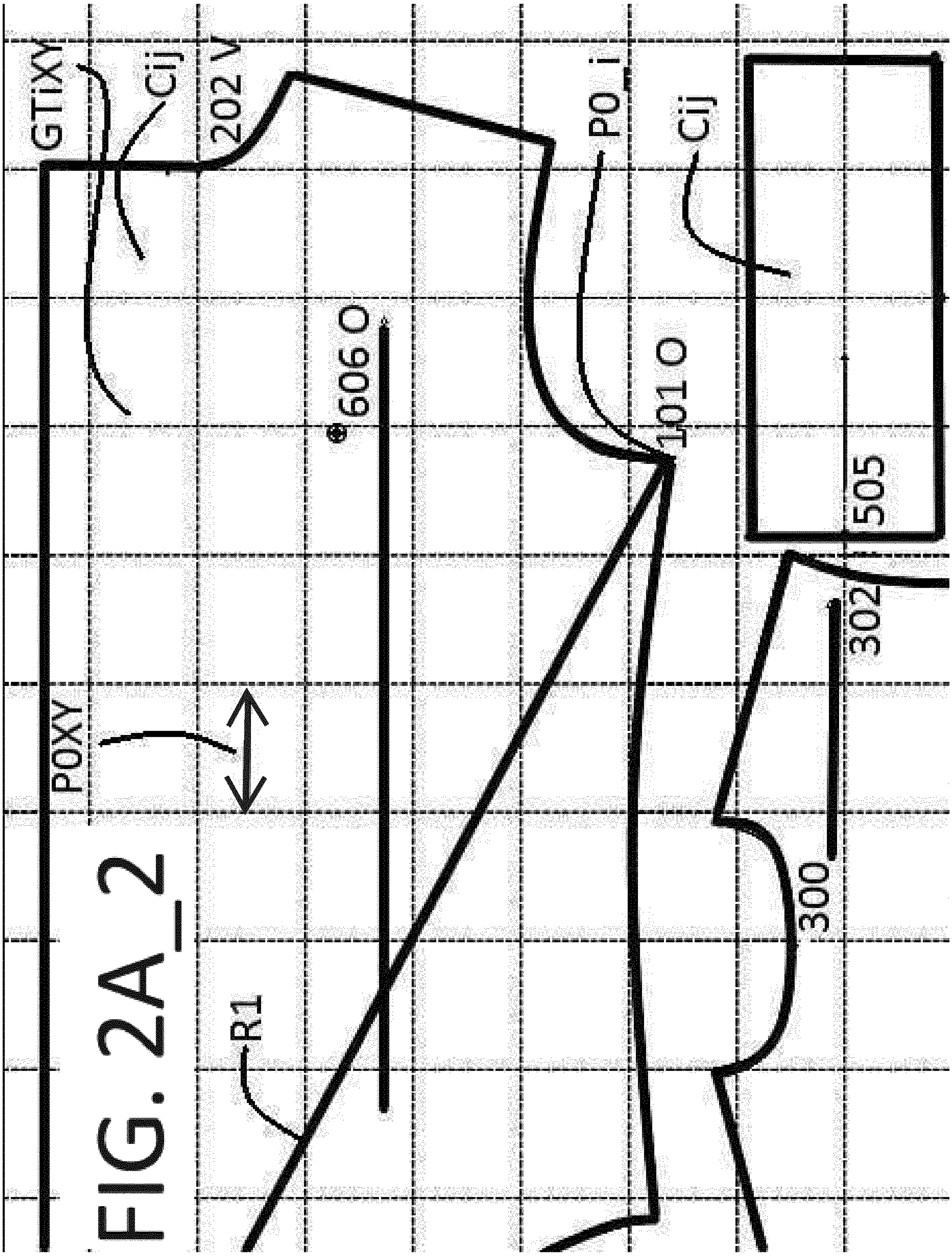


FIG. 2A_2

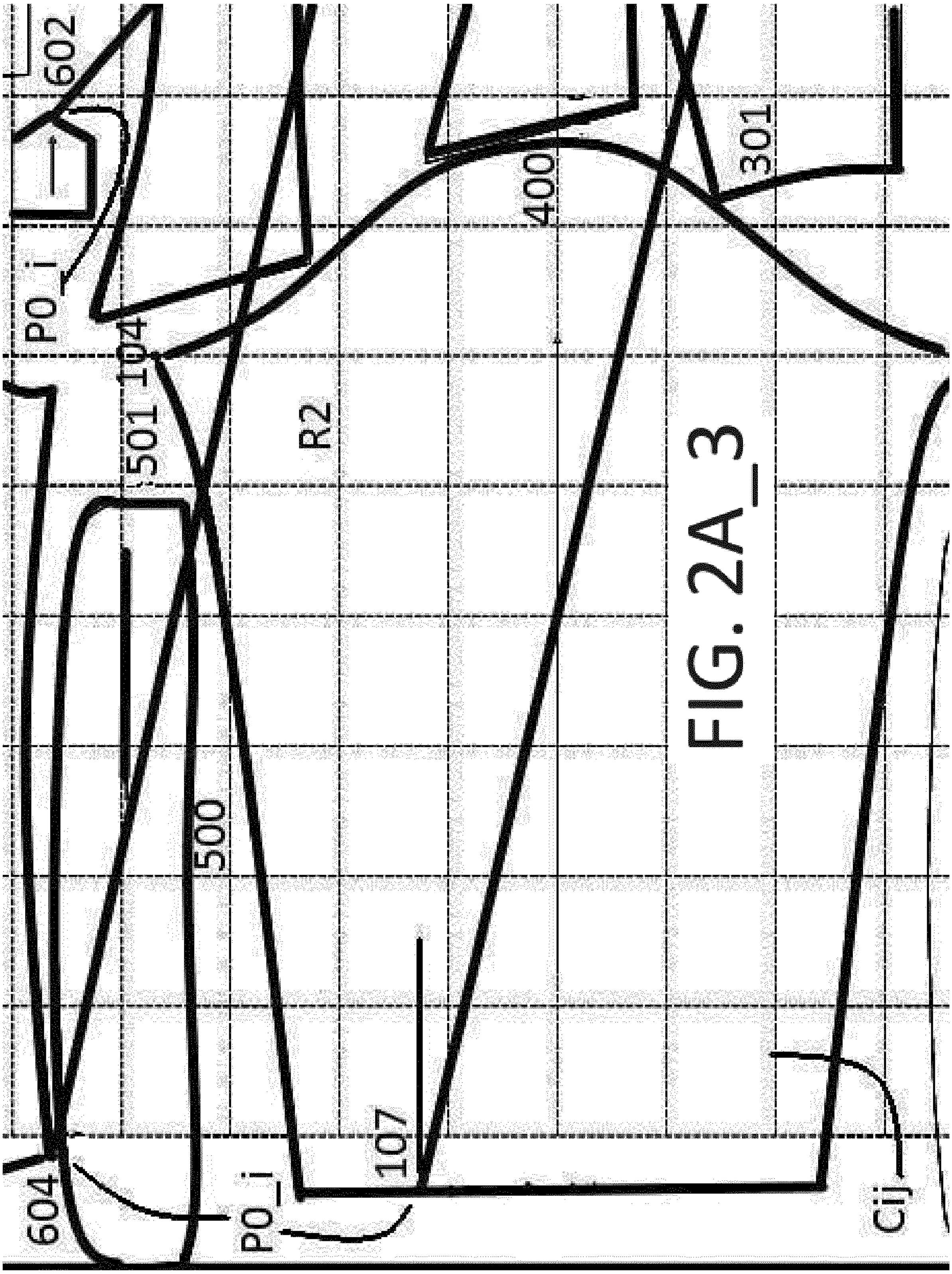


FIG. 2A_3

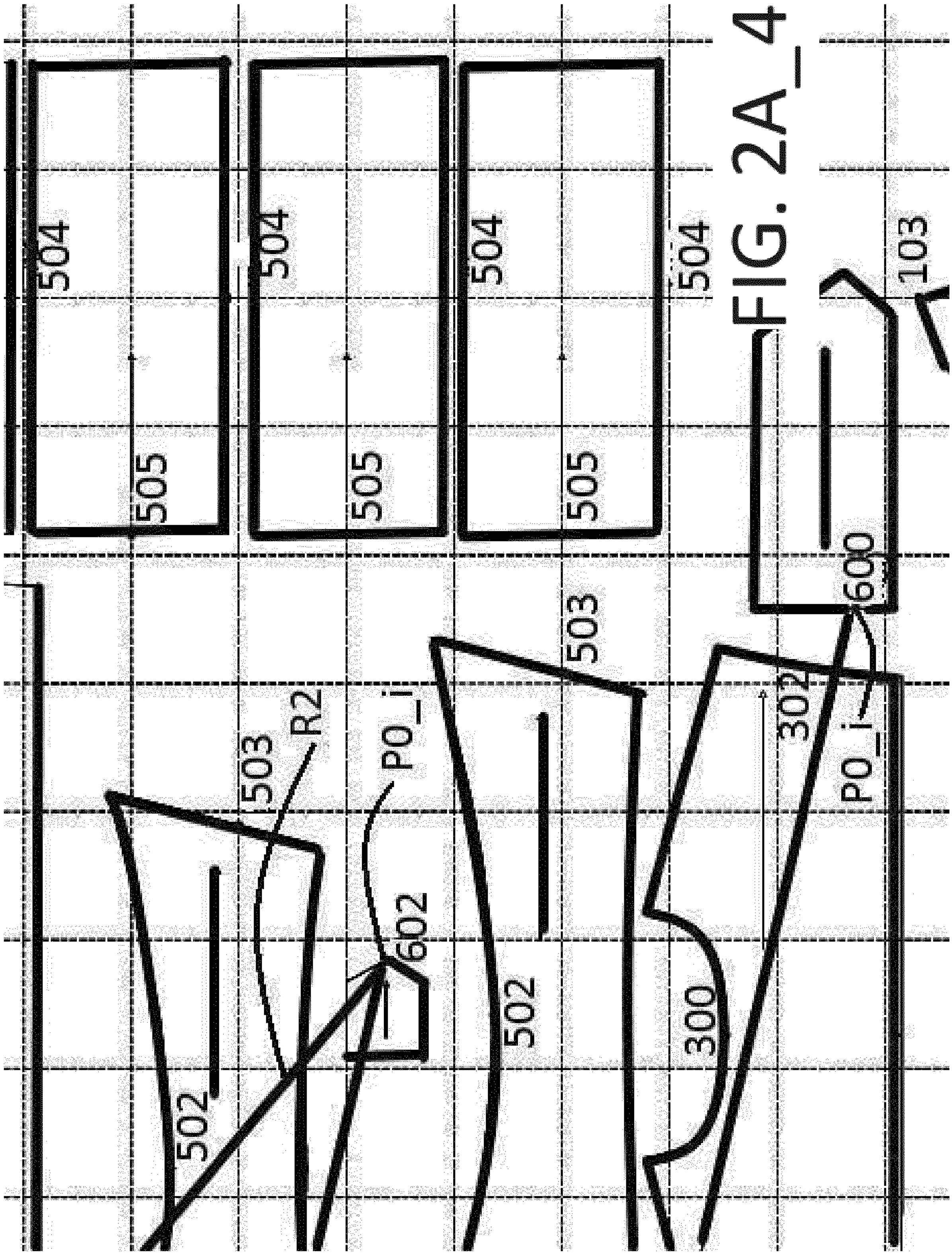
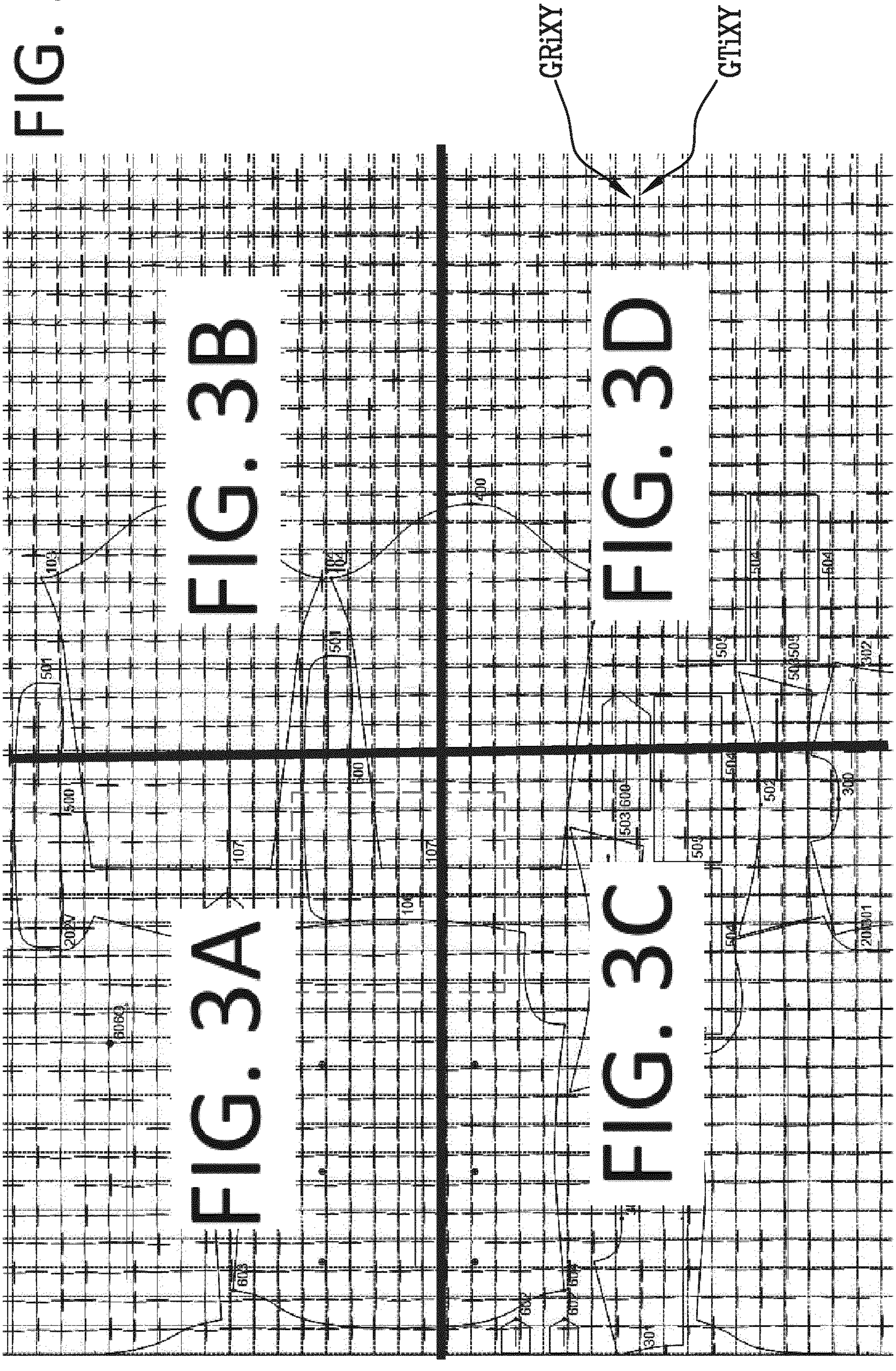


FIG. 2A_4

FIG. 3



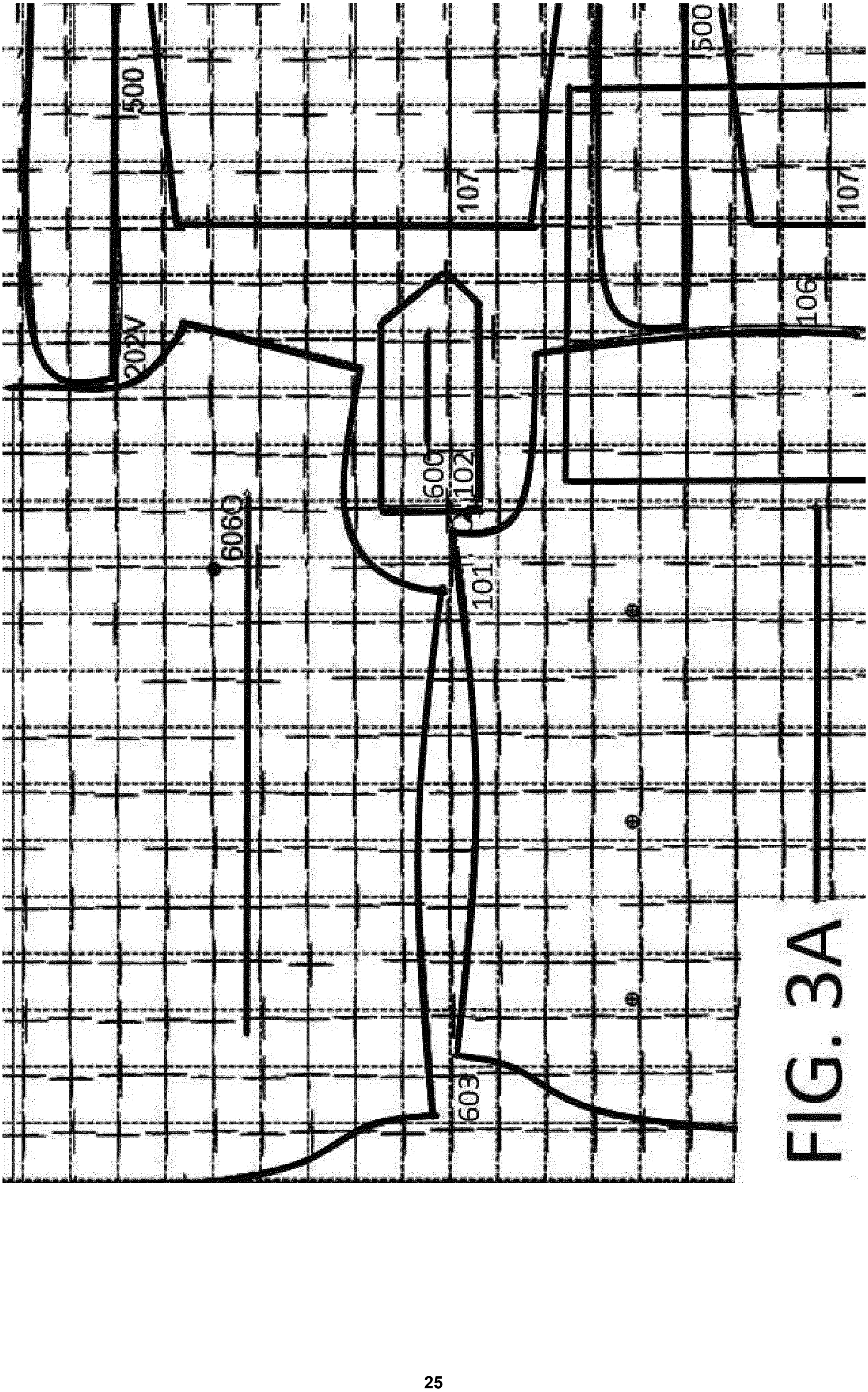


FIG. 3A

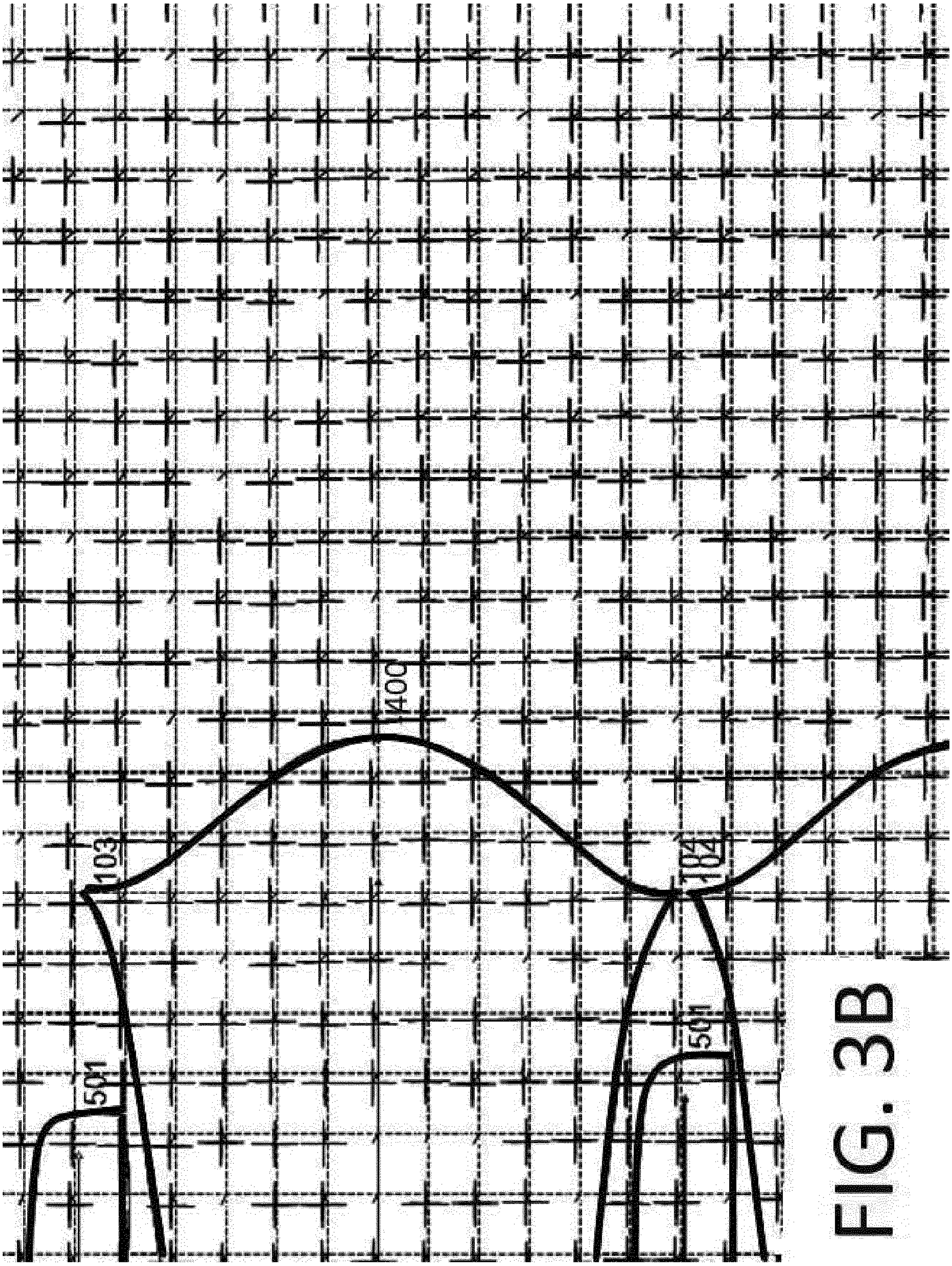
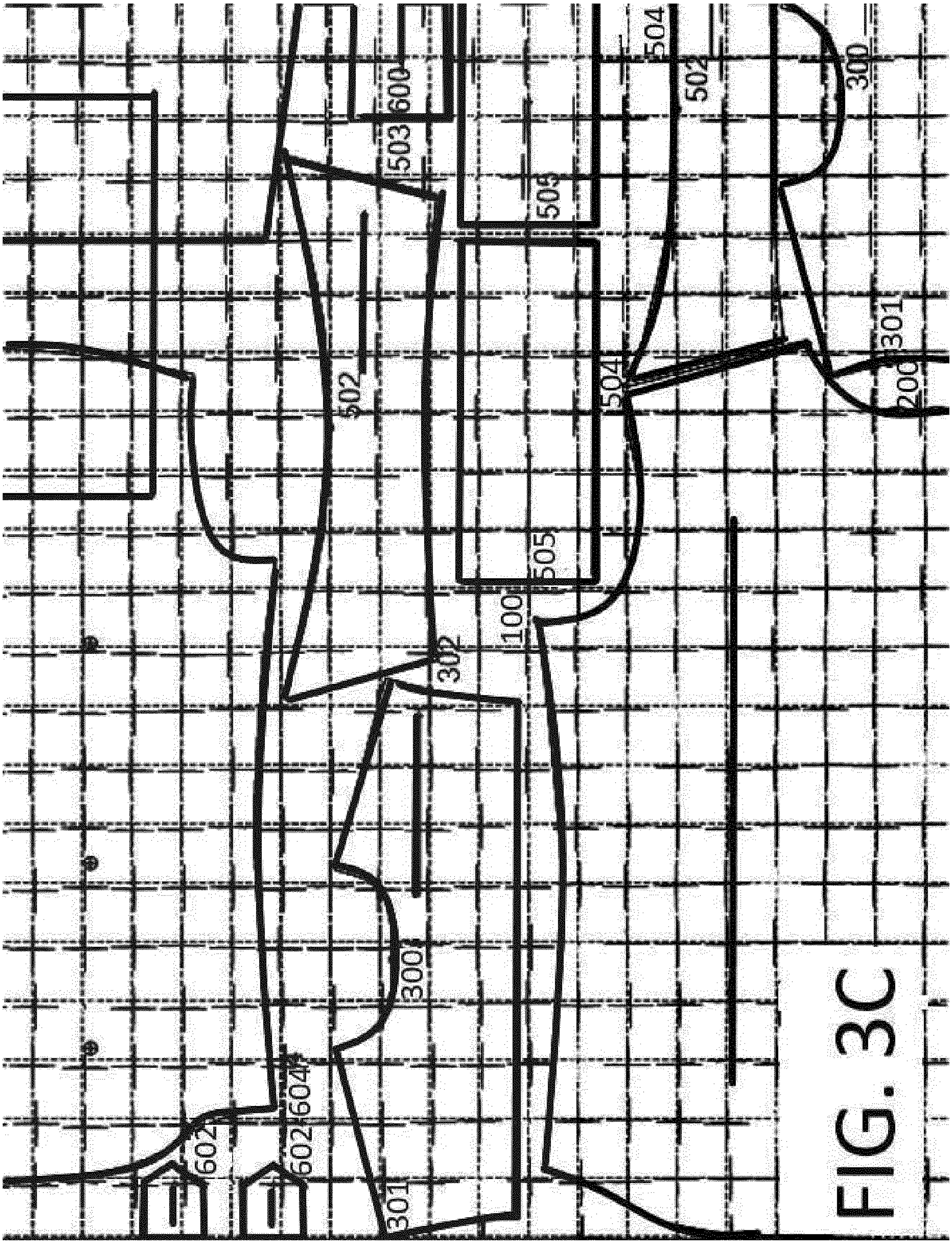


FIG. 3B



504
502
300
600
503
505
502
301
200
504
505
100
302
300
602
604
602
301

FIG. 3C

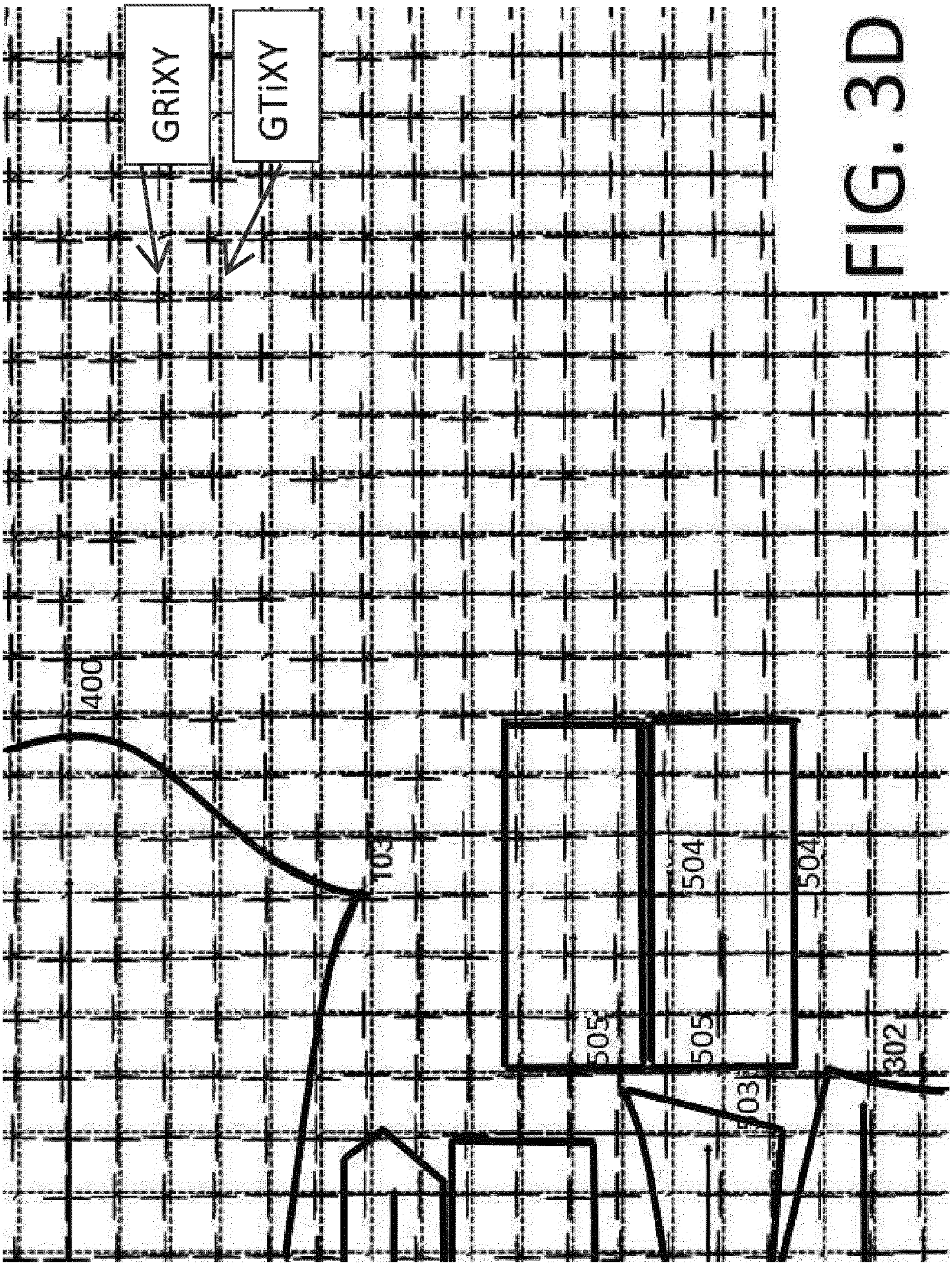


FIG. 3D

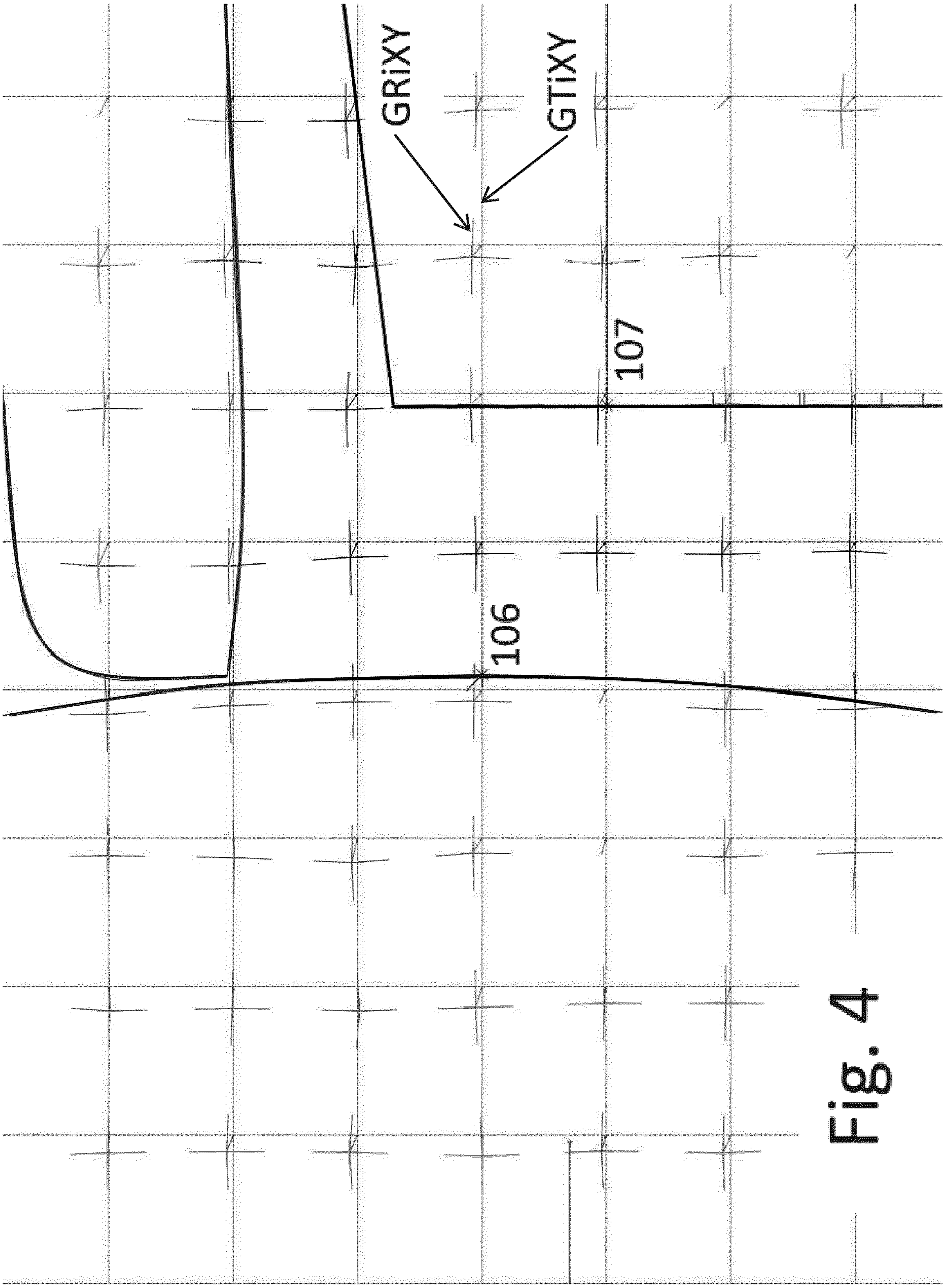


Fig. 4

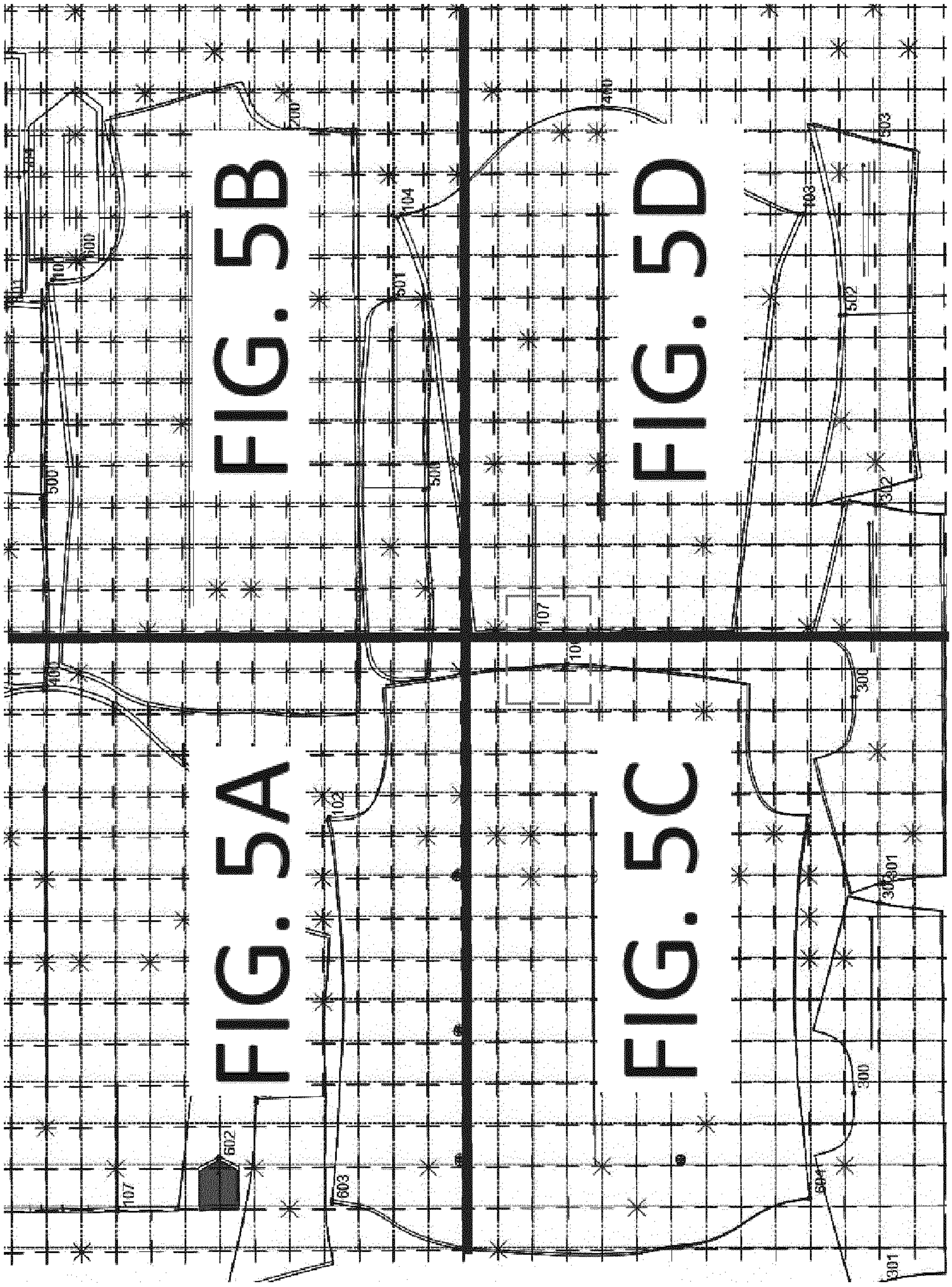


FIG. 5A
FIG. 5B
FIG. 5C
FIG. 5D
200
104
501
500
400
503
103
502
302
107
300
102
602
603
604
301

Fig.5

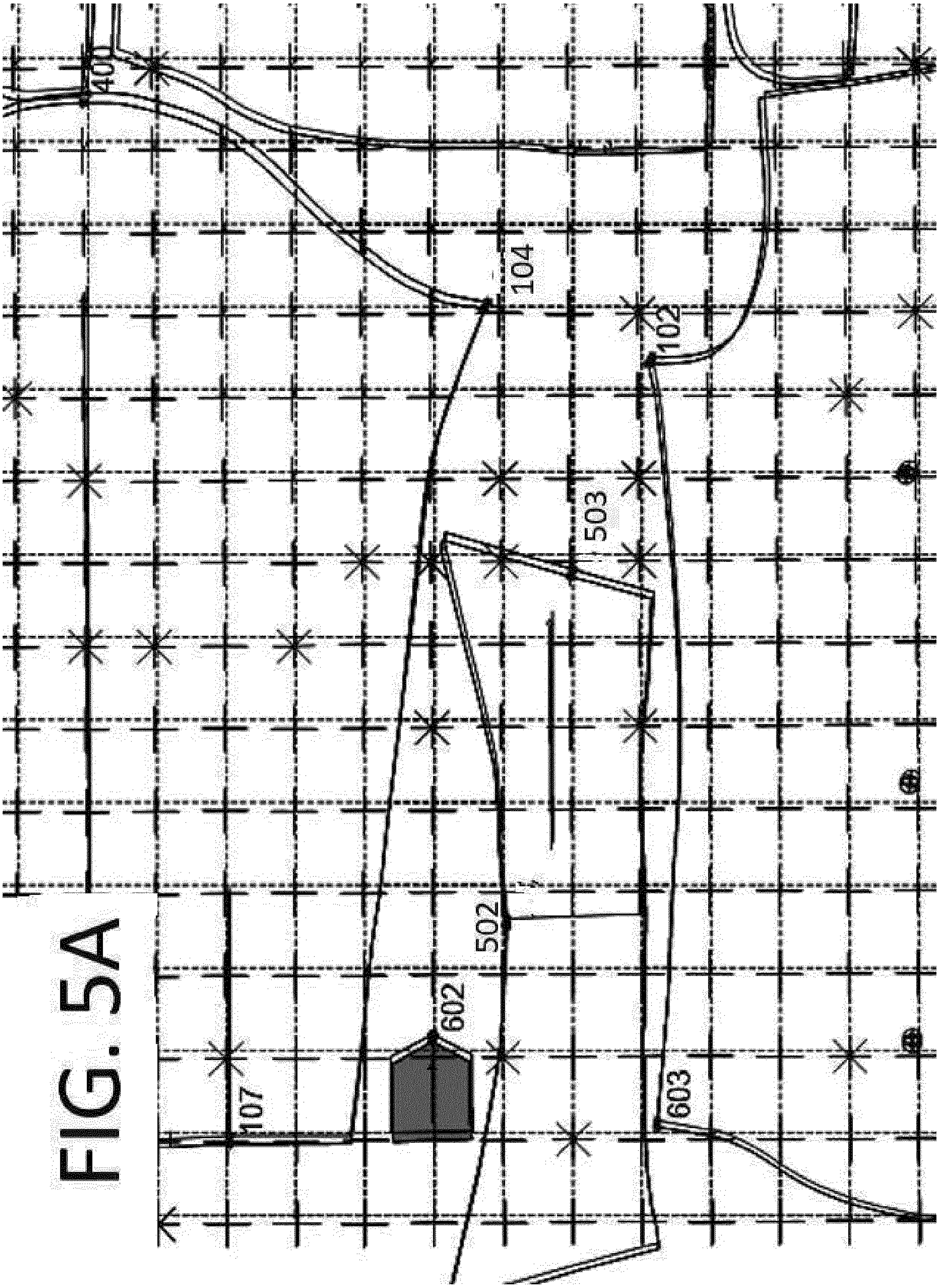


FIG. 5A

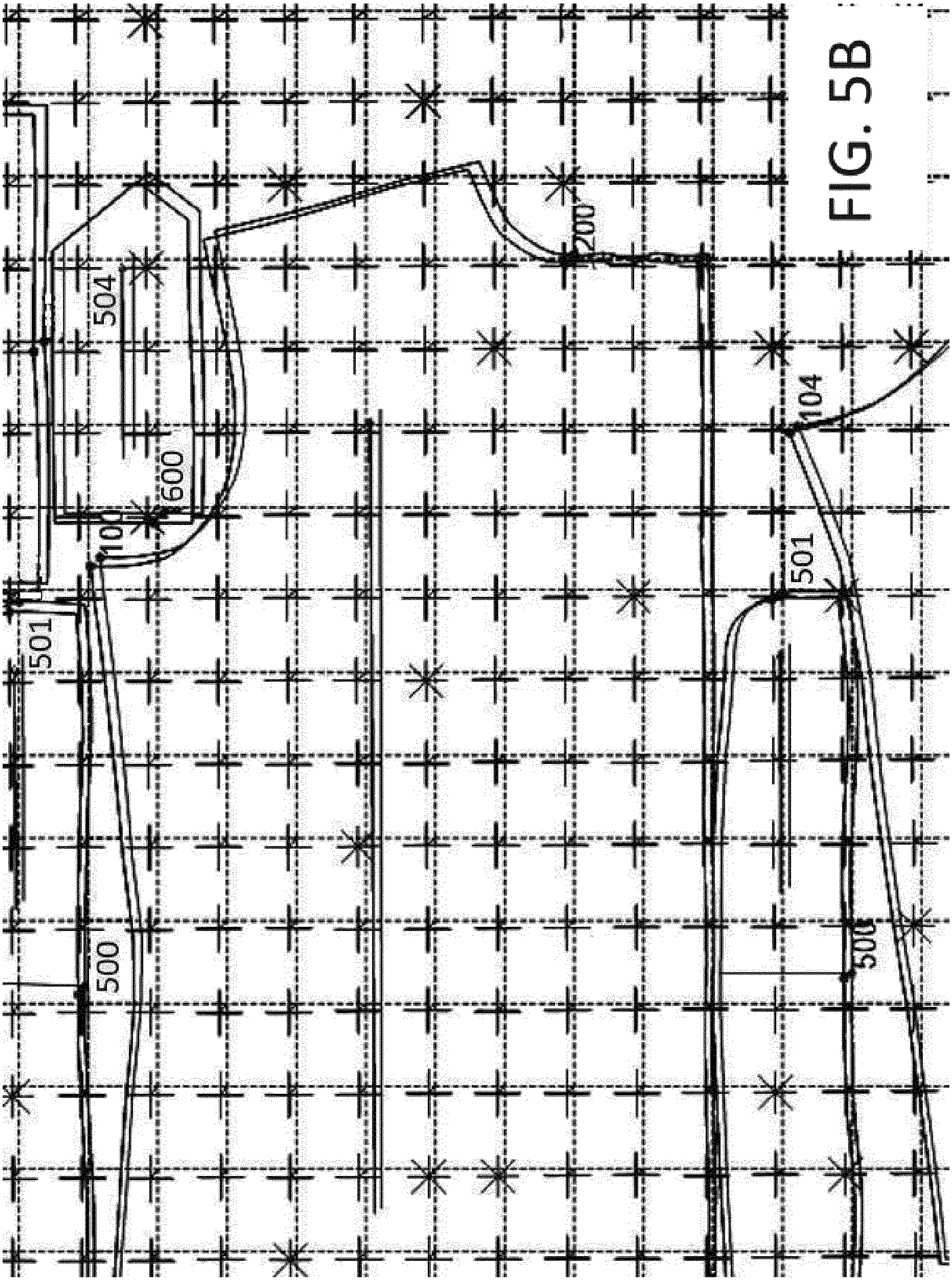


FIG. 5B

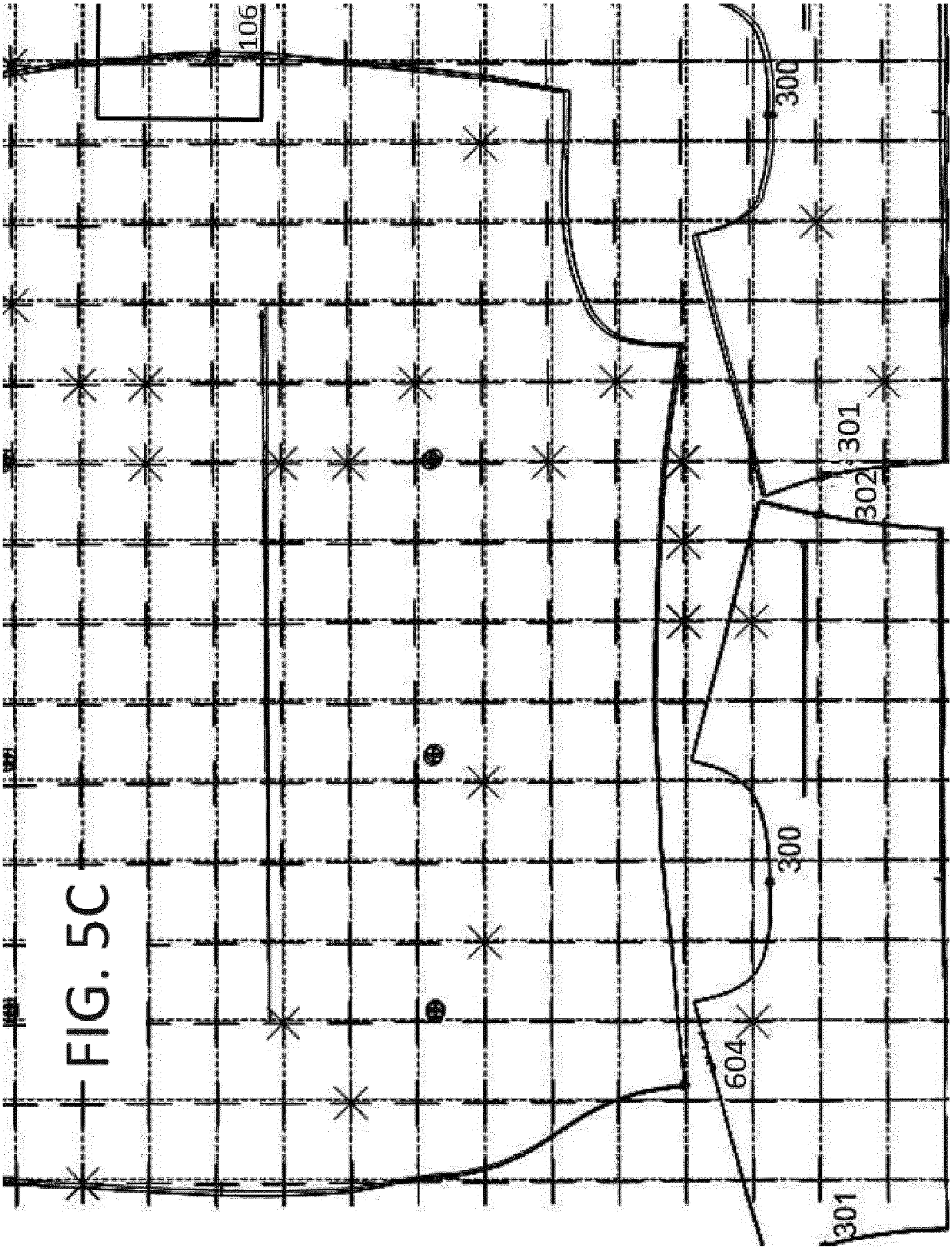


FIG. 5C

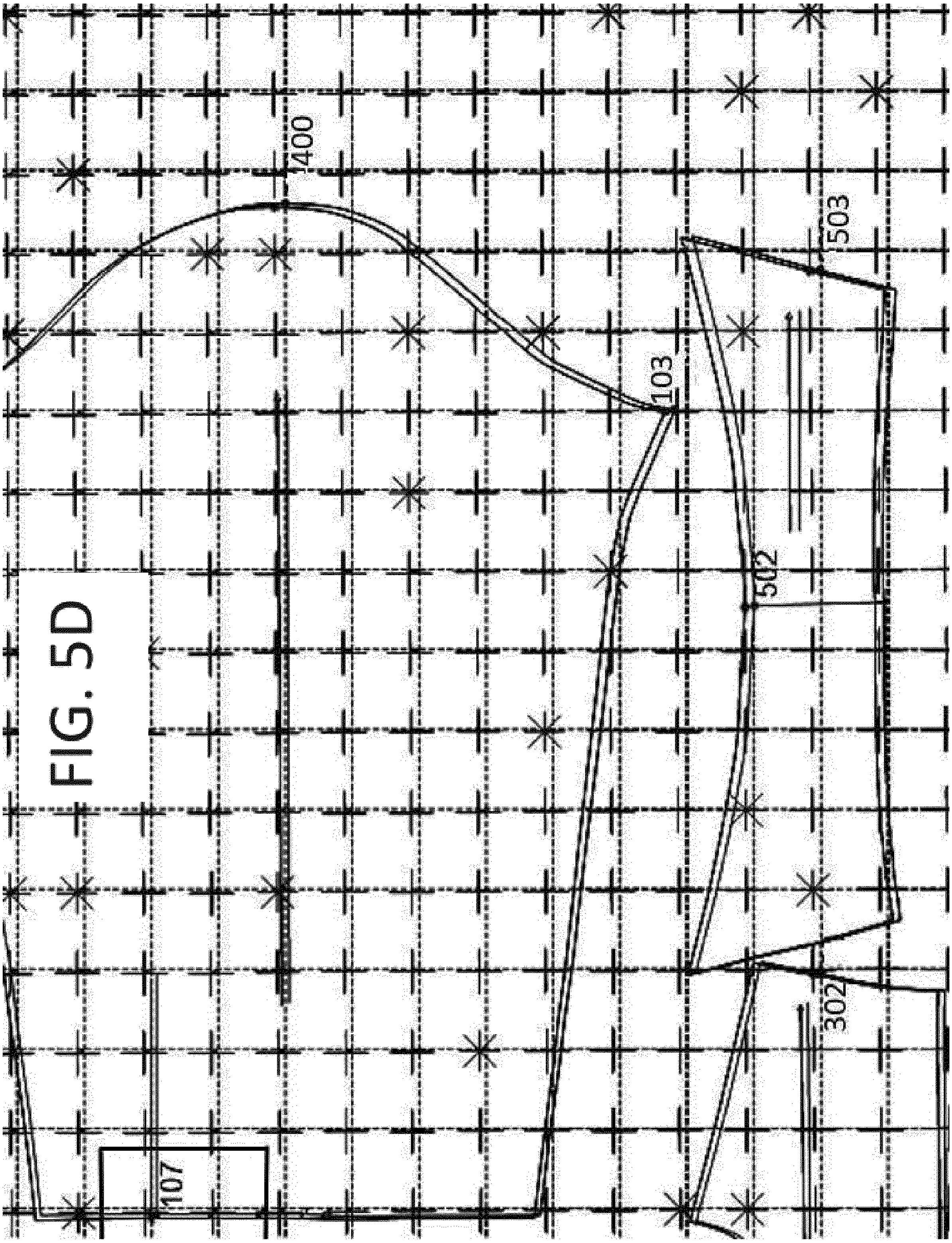


FIG. 5D

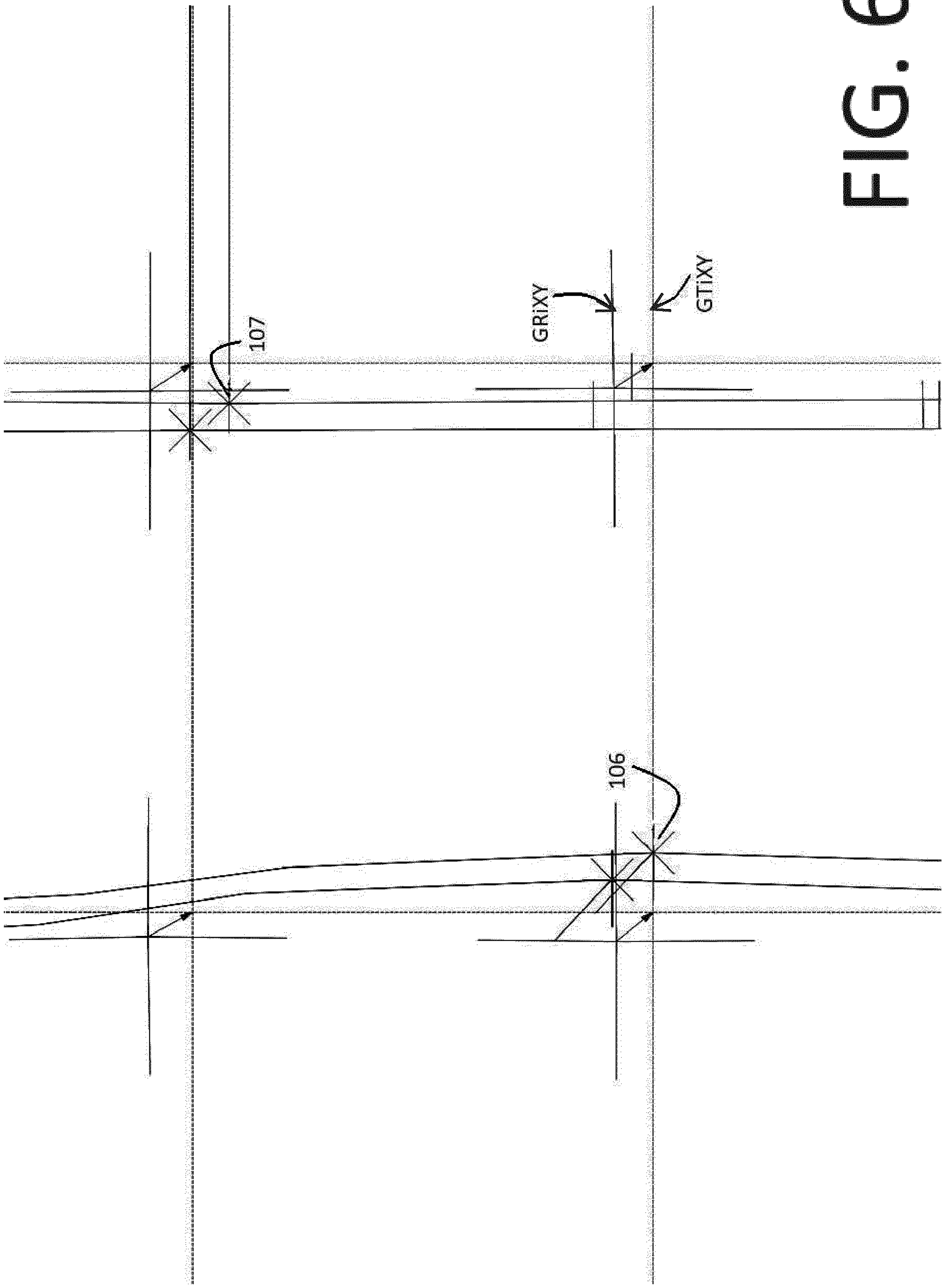


FIG. 6

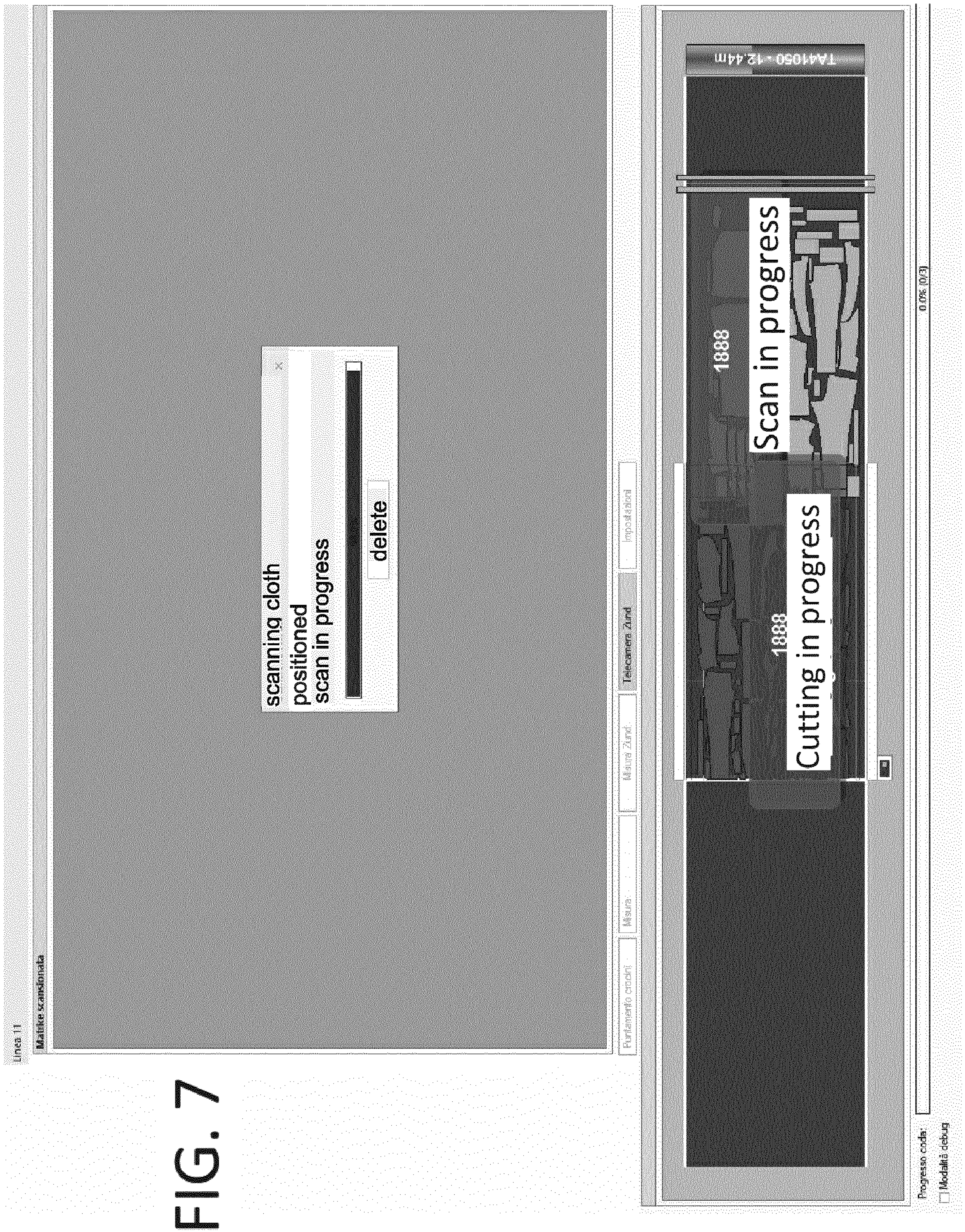

Linea 11
Matrice scansionata
scanning cloth
positioned
scan in progress
delete
Telecamera Zund
Impostazioni
TA41050 - 12.44m
1888
Scan in progress
1888
Cutting in progress
0.0% (0/3)
Progresso coda:
Modalità debug

FIG. 7

TA41050 - BF00781.403 (1/3)

# name	ODL	Initial lenght	final lenght	Diff.	status
1	1888	2.928	2.832	-0.097	cutting completed
2	1888	2.946	2.948	+0.002	queued for cutting
3	1888	1.704	1.704	-0.000	queued for scanning
Total		7.579	7.484	-0.095	

TA40155 - BF00767.111 (0/3)

# name	ODL	Initial lenght	final lenght	Diff.	status
1	1777	2.971	2.971	-0.000	queued for scanning
2	1777	3.127	3.127	-0.000	queued for scanning
3	1777	3.233	3.233	-0.000	queued for scanning
Total		9.332	9.332	0.000	

TA40306 - BF00767.111 (0/9)

# name	ODL	Initial lenght	final lenght	Diff.	status
1	1776	3.061	3.061	-0.000	queued for scanning
2	1776	3.289	3.289	-0.000	queued for scanning
3	1776	3.418	3.418	-0.000	queued for scanning
4	1782	3.054	3.054	-0.000	queued for scanning
5	1782	3.119	3.119	-0.000	queued for scanning
6	1782	3.178	3.178	-0.000	queued for scanning
7	1782	3.178	3.178	-0.000	queued for scanning
8	1782	3.296	3.296	-0.000	queued for scanning
9	1782	3.296	3.296	-0.000	queued for scanning
Total		28.889	28.889	0.000	

TA40304 - BF00767.111 (0/5)

FIG. 7A

ODL	Initial lenght	final lenght	Diff.	status
1779	3.769	3.769	-0.000	queued for

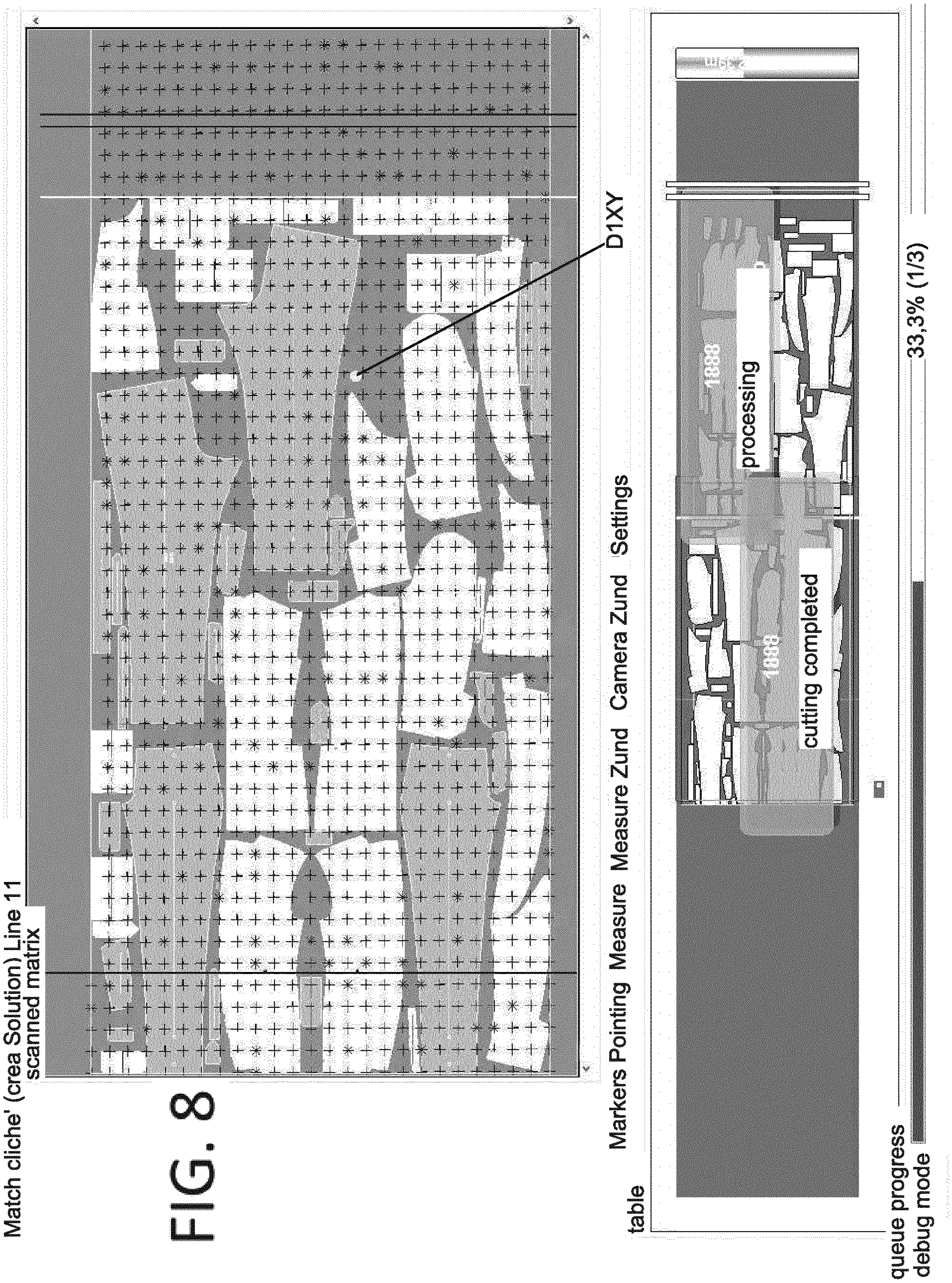

Match cliche' (crea Solution) Line 11
scanned matrix
D1XY
Markers Pointing Measure Measure Zund Camera Zund Settings
table
processing
cutting completed
queue progress
33,3% (1/3)
debug mode

FIG. 8

Waiting data :

path :	E:\Temp\VisionPattern\Risultati\Sync
Result :	Files of the found results

Reading data :

Laying lenght :	3201.18 mm
Detected area lenght :	3565.00 mm (+363.82)
Height matrix of points :	1540.00 mm
Detected area height:	1540.00 mm (+0.00)
Fabric :	Frame
Correction indexes :	(0.200000, 0.200000)
Raws	26
Columns :	49
Step X :	1
Step Y :	1
Detected markers:	1431
Interpoled markers :	1538 (107.477%)
Calculated markers:	0
Total markers :	1431
Defects :	1
Mean step of the frame :	(73.30, 61.50) mm
Mean step of the calculated frame	(73.30, 61.50) mm
Variance :	(0.00, 0.00) mm
back center 0% :	50.00%
mean back center :	30.75 mm
recalculated back center	30.75 mm

Grids construction:

main grid :	
Origin:	(17.200, 93.000)
Step:	(73.300, 61.500)
Secondary Grid :	
Origin:	(53.850, 123.750)
Step:	(73.300, 61.500)

Defects construction :

Defect 1:	
Type:	1
Type name :	Circle
Position	(2346.600, 744.600)
Radius :	17.500

Automatic positioning :

positining rules :	Frame (new line) - cloth
Processing time :	0.750 minutes
Positioned pieces :	49
Lenght:	3.833m
Efficiency :	75.074%

FIG.8A

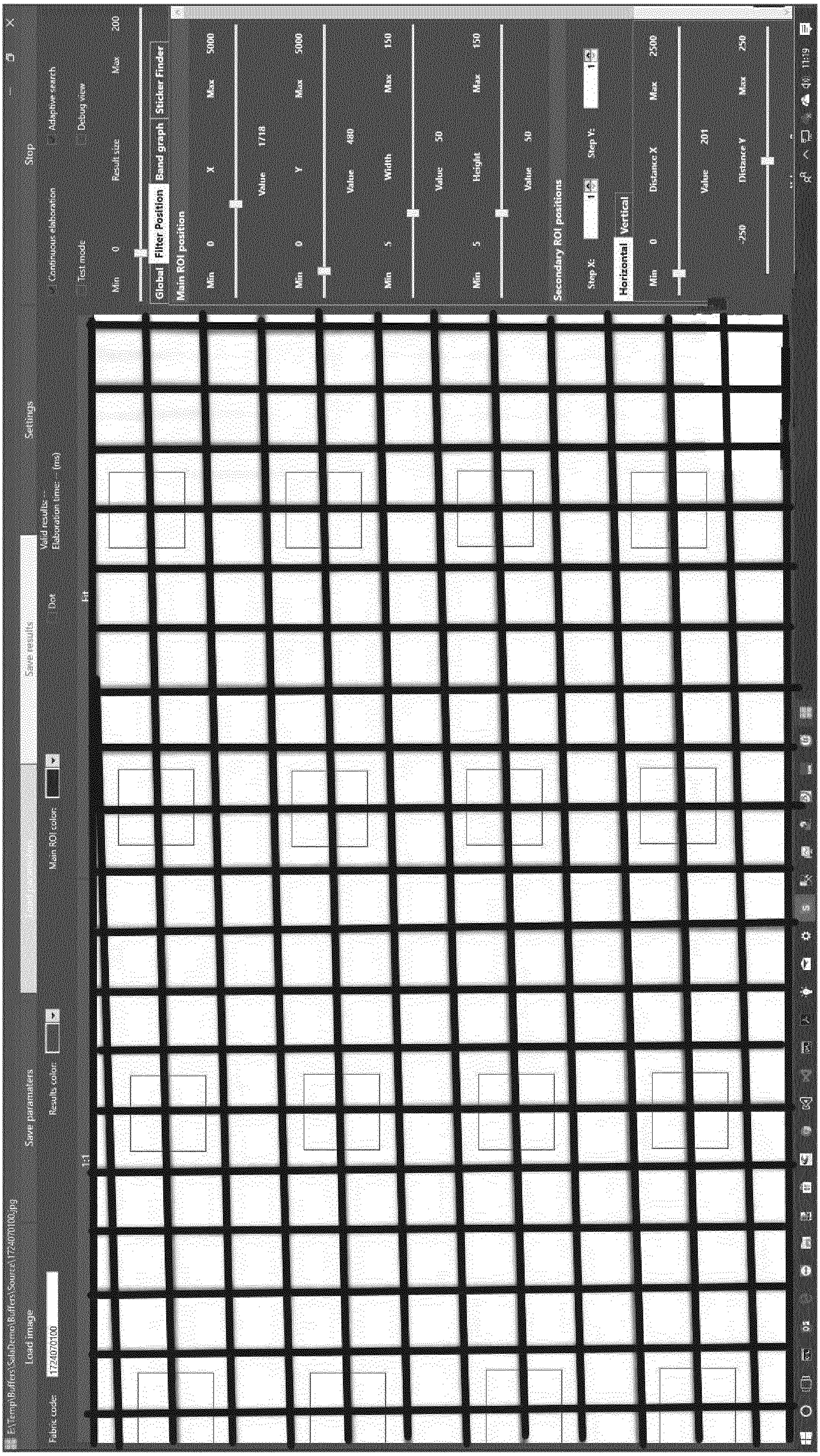

Load image
Save parameters
Save results
Settings
Stop
Fabric code:
1724070100
Results color:
Main ROI color:
Continuous elaboration
Adaptive search
Test mode
Debug view
Result size
Global
Filter Position
Band graph
Sticker Finder
Main ROI position
Secondary ROI positions
Step X:
Step Y:
Horizontal
Vertical
Distance X
Distance Y

FIG.9

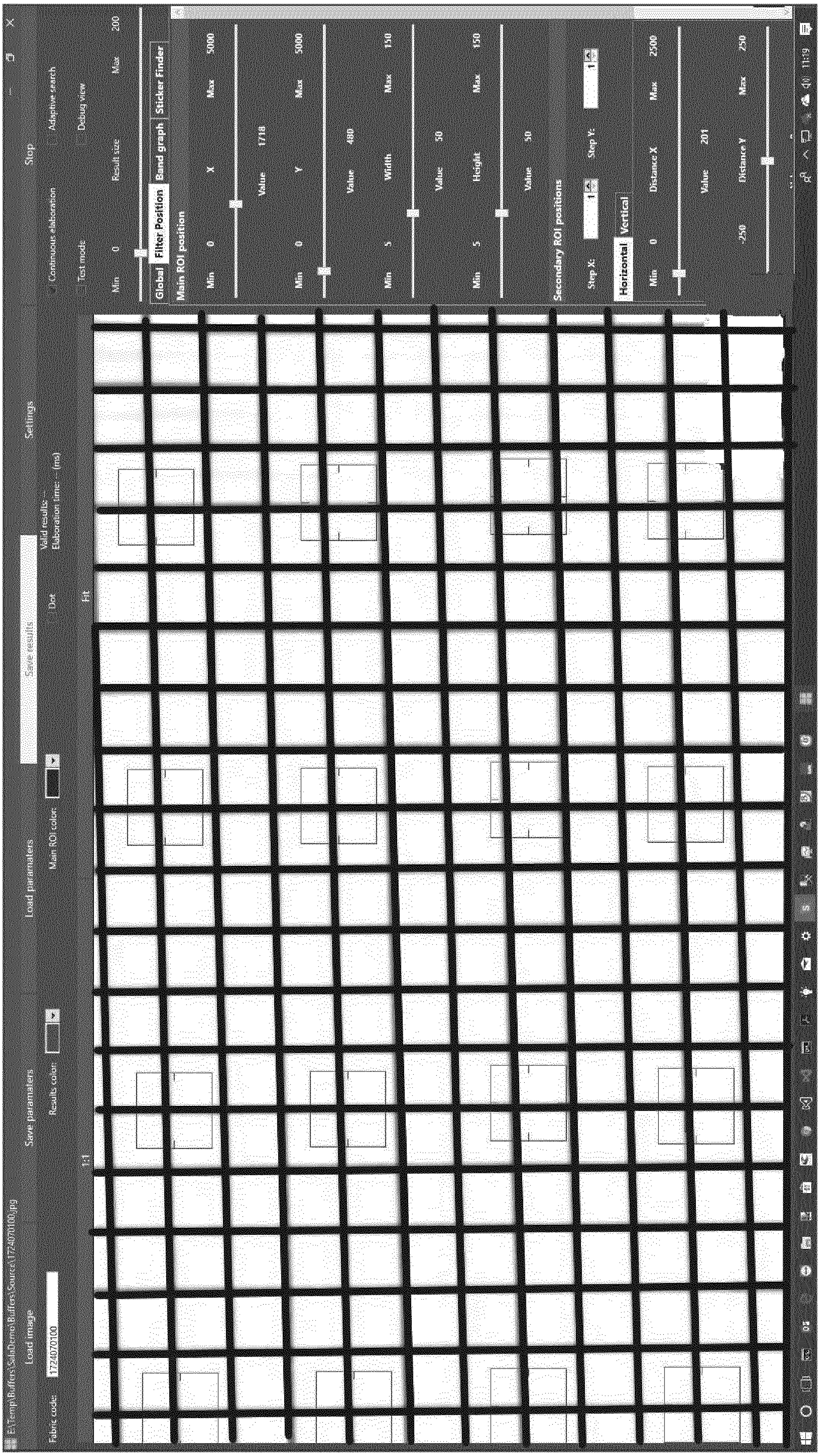

E:\Temp\Buffers\SalaDemo\Buffers\Source\1724070100.jpg
Load image
Save paramaters
Load paramaters
Settings
Stop
Fabric code: 1724070100
Results color:
Main ROI color:
Save results
Dot
Valid results: --
Elaboration time: -- (ms)
Continuous elaboration
Adaptive search
Test mode
Debug view
Result size
Global
Filter Position
Band graph
Sticker Finder
Main ROI position
Secondary ROI positions
Step X:
Step Y:
Horizontal
Vertical
Distance X
Distance Y
Width
Height
Value
Min
Max
1:1
Fit

FIG.10

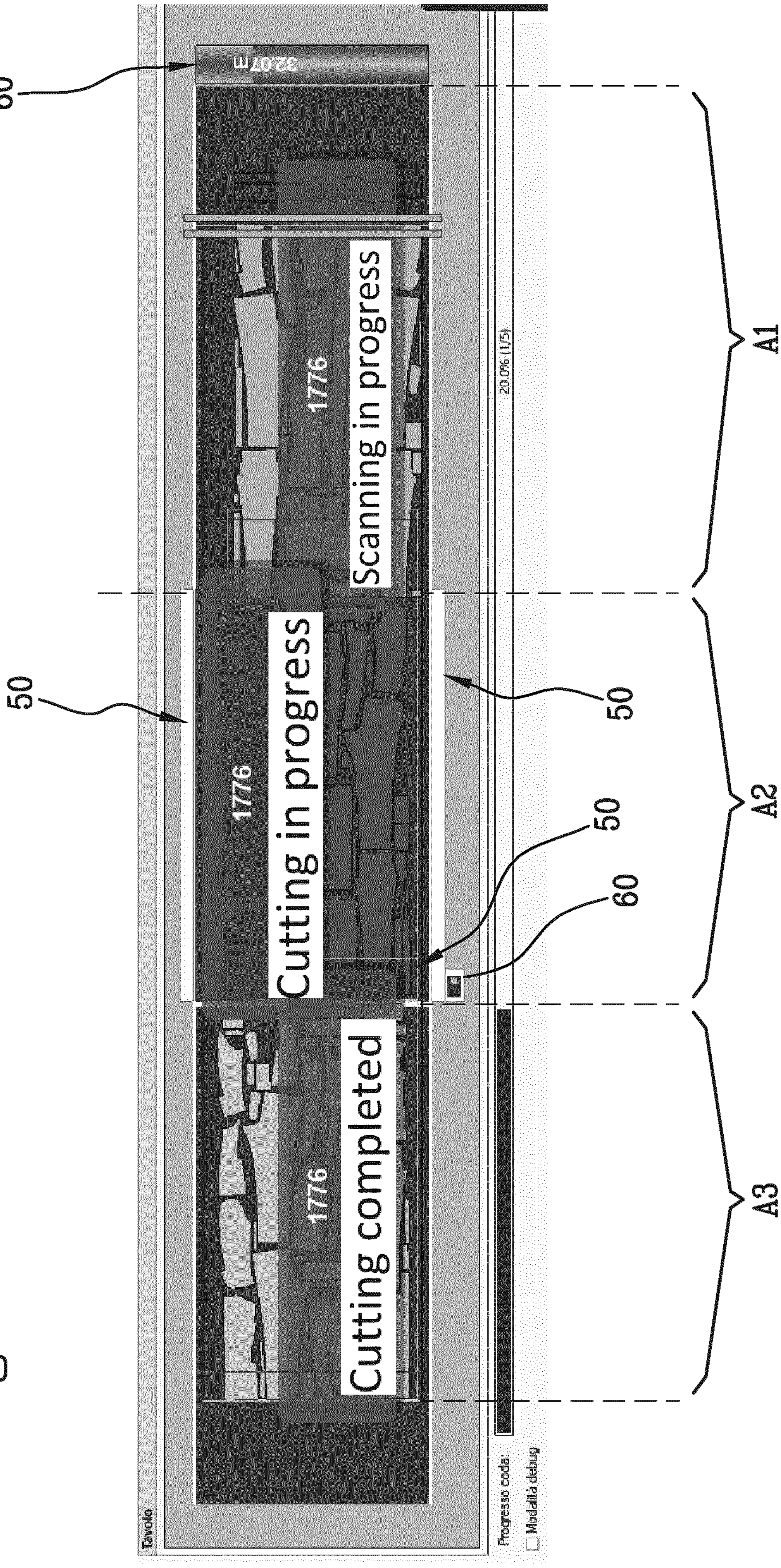

60
32.07 m
50
50
50
60
A1
A2
A3
1776
Scanning in progress
1776
Cutting in progress
1776
Cutting completed
20.0% (1/5)
Tavolo
Progresso coda:
Modalità debug

Fig.11