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(54) **METHOD FOR PRODUCING MOTIFS ON LEATHER AND RELATED LEATHER PUNCHING MACHINE**

VERFAHREN ZUR HERSTELLUNG VON MOTIVEN AUF LEDER UND ENTSPRECHENDE
LEDERSTANZMASCHINE

PROCÉDÉ DE PRODUCTION DE MOTIFS SUR DU CUIR ET MACHINE À DÉCOUPER LE CUIR
ASSOCIÉE

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Description

TECHNICAL SECTOR

[0001] The present invention relates to a continuous automatic punching machine for the processing of leather pieces or similar sheet materials, in which a conveyor belt on which is lying a sheet material to be processed, passes through a machine processing section in which it passes over an abutment plate above which a processing crosspiece providing at its lower end a tool assembly moves with a reciprocating motion, said tool assembly including at least one tool holder head comprising an elongated tool-carrying bar provided with a plurality of tools arranged to protrude from said tool-carrying bar.

[0002] The invention also relates to a tool assembly associable to a continuous automatic punching machine as outlined above.

[0003] The invention also concerns a method for producing ornamental motifs on leather or similar sheet or tape material by an automatic punching machine as outlined above.

STATE OF THE ART

[0004] In the field of leather goods manufacturing, for example footwear, clothing, coverings for upholstered furniture, it is expected, as known, the use of leather or the like on which are carried out some special finishing processing to confer a certain aesthetic appearance to the final product. It is referred, in particular, to operations suitable for producing incisions or punching with a well-defined decorative motif, which is repeated over the entire product surface, as well as for impressing said outer surface or for applying other plating materials, having various shapes and sizes, uniformly distributed on the surface thereof.

[0005] In order to obtain the repetition of a specimen of a decorative motif on the entire surface of the sheet materials are currently used machines able to perform said operations in a sufficiently precise and automatic way.

[0006] Said conventional machines, generically named continuous automatic punching machines basically comprise: two uprights; a processing crosspiece mounted on the uprights in a vertically sliding mode; a tool holder head fixed to the bottom side of the processing crosspiece so that from the lower end of the processing crosspiece the work tools protrude downwards; drive members of said processing crosspiece to cause a vertical movement of the upper crosspiece with respect to the uprights so to produce a reciprocating up and down of the processing crosspiece which constitutes the working movement of the tool holder head; a workpiece support assembly usually mounted on a fixed lower crosspiece comprising a fixed horizontal abutment plane arranged substantially on the vertical of the tool holder head; means for adjusting the work depth suitable to set

the vertical position of the horizontal abutment plane to adjust the work depth corresponding to the distance between the working surface of the tools of the tool-holder head and the horizontal abutment plane when the tool holder head is placed in a lower end position; a conveyor assembly comprising a conveyor belt which unwinds from a first roller with a horizontal axis arranged at the input side of the machine, passes through in unwound configuration a machine working section lying on the abutment plane and interposed between the abutment plane and the tool-holder head, and it is rewound on a second roller with a horizontal axis arranged at the output side of the machine; conveyor belt drive members regulating the unwinding of the conveyor belt from the first roller, the conveyor belt movement in unwound configuration in the working section, corresponding to a processing movement, and the rewinding of the conveyor belt on the second conveyor roller.

[0007] The sheet materials to be worked are laid on the conveyor belt in the unwound configuration at the input side of the machine, then they are dragged by the advancement of the conveyor belt through the working section and then they exit the machine, still in consequence of the conveyor belt's advancement, at the output side of the machine before the conveyor belt is rewound on the second roller. In the processing section, the tools move perpendicularly with respect to the abutment plane on which the conveyor belt runs thanks to the reciprocating vertical movement of the tool holder heads so that the tool in its downwards stroke is able to interact with the sheet material to perform the planned processing of cutting, punching, impressing or the like, which mainly depends on the geometry of the tool and the machining depth set.

[0008] In a conventional automatic punching machine a tool-holder head is usually provided with a plurality of tool sets aligned in the cross-direction of the machine and tool set provides, on one or more lines, the needed number of tools to accomplish a specimen of the desired repetitive decorative motif. The processing of leather sheets takes place thanks to the movement in the feed direction of the conveyor belt 71 carrying the leathers to be processed at the tool-holder head and thanks to the reciprocating movement in the feed direction Z of the processing crosspiece 30, thanks to which the tools are able to perform their reciprocating processing movement composed of a stroke downwards and one upward to return. In conventional automatic punching machine during each stroke of the tool-holder head on the leather the specimens of decorative repetitive motifs arranged aligned sequentially for the length of the tool-holder head are performed, that is, in the cross-direction of the machine, then the conveyor belt is moved forward by a pitch as the distance between two consecutive repetitive motifs and then the next line of repetitive decorative motifs thanks to a new stroke of the tool holder head is obtained. Referring to the attached figures 8 and 9, when is needed getting a repetitive decorative motif as the one in FIG 8,

the tool-holder head for a conventional machine is set up to play side by side one another for the whole length of the tool-holder head itself (cross direction of the machine) some specimens of the repetitive decorative motif in which each specimen is the one represented in figure 9, and to each dot of fig. 9 corresponds a punching tool expected in the tool-holder head. The repetitive decorative motif shown in FIG. 9 is achieved as the result of just one stroke, then, during the return stroke of the processing crosspiece the conveyor belt is moved forwards in the direction of the pitch A between two repetitive decorative motifs.

[0009] A conventional machine like that described above is presented, for example in utility model granted in Italy filed with application number PI2008U000003.

[0010] High manufacturing capacity is achievable for machines such as the one described above, but those machines are not flexible when it's to be modified the repetitive decorative motif due to the fact that must be replaced the entire tool-holder head.

[0011] Further leather punching machines are shown in the prior art documents WO2004/099448 and FR2408438.

SUMMARY OF THE INVENTION

[0012] The object of the present invention is to propose a tool assembly for a continuous automatic punching machine that allows to considerably increasing the machine's versatility.

[0013] Another object of the present invention is to propose a tool assembly for continuous automatic punching machine that allows doubling the productivity of the machine.

[0014] Another object of the present invention is to propose a tool assembly for continuous automatic punching machines suitable especially for the execution of specimens.

[0015] Another object of the present invention is to propose a continuous automatic punching machine able to produce many different types of repetitive decorative motifs without needing to replace the tool-holder head.

[0016] Another object of the present invention is to propose a continuous automatic punching machine thanks to which it is possible halving the timing to placement of two different lots.

[0017] Another object of the present invention is to propose a continuous automatic punching machine provided with at least two tool-holder heads connected integrally to the same processing crosspiece but that can be operated independently of each other.

[0018] Another object of the present invention is to propose a continuous automatic punching machine provided with an optimized workpiece support assembly.

[0019] Another object of the present invention is to propose a method for the production of ornamental motifs on leather or similar material in sheets or tape by means of a continuous automatic punching machine, which al-

lows considerably simplifying and speeding up the setting of the working programs for this type of machines.

[0020] A further object of the present invention is to propose a method for the production of ornamental motifs of leather or similar material in sheets or tape by means of a continuous automatic punching machine able to take full advantage from the peculiarities and the versatility of a new concept continuous automatic punching machine.

[0021] According to a first aspect of the present invention, the above objects, and others, are achieved by means of a continuous automatic punching machines suitable to carry out continuous processing of leather or similar material in sheets, according to what stated in claim 1.

[0022] In a continuous automatic punching machine a conveyor belt, on which is laid a sheet of material to be processed, passes through a machine processing section in which it passes over an abutment plate above which a processing crosspiece providing at its lower end a tool assembly moves with a reciprocating motion.

[0023] Conventionally, a continuous automatic punching machine of the type suitable to perform operations of punching, die-cutting, cutting, engraving, holing or the like on the leather pieces or similar sheet materials, comprising at least two uprights, a processing crosspiece mounted on said at least two uprights in sliding mode which is inferiorly integral with a tool assembly comprising a tool-holder head, drive members of said processing crosspiece to cause its sliding with respect to said uprights so as to make them perform a reciprocating movement which is a work movement of said tool assembly in a work direction, a workpiece support assembly positioned below said tool assembly and comprising an abutment plane, a conveyor assembly comprising a conveyor belt arranged to pass in a unwound configuration above said abutment plane a processing section of said continuous automatic punching machine between the tool assembly and the abutment plane, according to the said feed direction, with a leather piece (P) or similar sheet material to be processed that is supplied to said processing section lying on said conveyor belt according to the feed direction. Conventionally the above-mentioned continuous automatic punching machines comprises a tool assembly that includes a tool-holder head comprising an elongated tool-carrying bar provided with one or more tools arranged to protrude from said tool-carrying bar towards the abutment plane.

[0024] According to a characteristic feature of the present invention, the tool assembly comprises at least a first and a second tool holder heads arranged consecutively with the same orientation, each of them providing a tool-carrying bar coupled to the tool assembly for sliding in a elongation direction (cross direction of the punching machine) of the corresponding tool-carrying bar, and further comprises cross direction drive means associated with each tool-holder head, adapted to perform sliding in the said cross direction of each tool-holder head, independently from each other.

[0025] Each of the two tool-holder heads is very versatile due to the controlled movement in cross direction. Thanks to the cross direction movement, each tool-holder head is able to mount a reduced number of tools that can be moved transversely so to be able to process any pitch between the first and the last tool of the tool-carrying bar. Furthermore, the presence of two independent tool holder heads allows doubling the productivity compared to a similar machine equipped with a single tool-holder head.

[0026] Advantageously, the first and the second tool-holder head are arranged side by side and aligned one after the other in the feed direction of the conveyor belt.

[0027] Advantageously again, the tool assembly comprises a support frame provided with removable connection means adapted to allow anchoring of said tool assembly to the processing crosspiece, and further provided with at least a first and a second guide rails parallel to each other, each tool holder head being associated with a respective guide rail through a corresponding slide member.

[0028] Still advantageously, each tool-holder head comprises an elongated frame in which a work side can be identified in which are formed a coupling seat for the tool-carrying bar and housing seats for a piece holder member comprising a sheet-pressing plate and elastic connection means adapted to be inserted into said housings for connecting said sheet-pressing plate with said elongated frame in sliding mode in a direction perpendicular to the plane of said sheet-pressing plate and with an elastic action such as to maintain a maximum distance between said sheet-pressing plate and said elongated frame.

[0029] Advantageously, the abutment plane comprises at least one first movable abutment member and at least a second movable abutment member each of them being movable in the direction of the feed direction, independently of one another, between an abutment position in which the movable abutment member is positioned to intercept tools of a respective tool holder head and a disengagement position in which the movable abutment member is positioned to not interfere with the stroke of the tools; and abutment member drive means suitable to actuate, independently of each other, the movable abutment members to move from the abutment position to the disengagement position and vice versa.

[0030] The continuous automatic punching machine outlined above comprises two tool holder heads associated with the same processing crosspiece and then integrally movable in the work direction. Although they are integral, the two tool holder heads are able to operate selectively thanks to the presence of corresponding movable abutment members of the abutment plane which, independently of each other, can be placed in a position in which they constitute an effective abutment plane for the head tool holder, and then allow it to work, and a disengagement position in which the tool holder head in its working stroke does not find a match, and then de-

forms the conveyor belt without the counter-action necessary to determine the processing of the sheet material to be processed.

[0031] Advantageously, the continuous automatic punching machine comprises computer numerical control means capable of controlling independently but in a coordinated manner, in order to perform a given punching program, the feeding movement of the conveyor belt in the feed direction, the selective displacement in the abutment position and in the disengagement position of the first movable abutment member, the selective displacement in the abutment position and in the disengagement position of the second movable abutment member, in a time-phased relation with the movement of the processing crosspiece in the work direction. Thanks to the above-described structure of the abutment plane, although each tool holder head moves integral to the other in the working direction, it is selectable the tool holder head which have to work at any given moment of processing thus allowing considerable advantages concerning the versatility of the machine, its productivity, the placing times and still others.

[0032] According to still another feature of the present invention the above objects, and others, are achieved by a method for the production of ornamental motifs of leather or similar material in sheets or tape by means of a continuous automatic punching machine, in accordance with what is stated in claim 9.

[0033] The method is applied to a continuous automatic punching machine of the type suitable to perform operations of punching, die cutting, slitting, cutting, holing, or the like, comprising

- a processing crosspiece to which is inferiorly integral a tool assembly comprising at least a first and a second tool holder head connected to said tool assembly for sliding in a elongation direction of said tool holder head, and, independently of one other, elongation direction drive means associated with said first tool holder head adapted to drive their slide movement in said elongation direction, independently from one another,
- drive members of said processing crosspiece to cause a reciprocating movement which is a work movement of said tool assembly in the direction of a work axis,
- a workpiece support assembly mounted below said tool assembly in correspondence to the latter and comprising an abutment plane,
- a conveyor assembly comprising a conveyor belt arranged to pass, in an unwound configuration above said abutment plane, a processing section of said continuous automatic punching machine between said tool assembly and said abutment plane in a feed direction, and supply means to determine the advancement of said conveyor belt so as to make said leather or similar material in sheets or tape to be processed pass through said processing section,

- computer numerical control means of said machine suitable for controlling said drive means, said supply means of the conveyor belt and said elongation direction drive means, as a function of punching programs executable by said machine,

[0034] The method of the invention comprises:

- the realization, through a graphical user interface of a computer program, of a drawing consisting of a plurality of signs that represent a specimen of a repetitive decorative motif (M) to be obtained on a sheet material to be processed,
- the conversion of said drawing in a work program of said continuous automatic punching machine (10),
- the automatic execution of said work program by said computer numerical control means.

and it is characterized in that the graphical user interface of said computer program provides for the possibility to produce and manage a number of layers or drawing sheets equal to the number of said tool holder heads, each layer or drawing sheet being associated with one of said tool holder heads.

[0035] The above outlined method allows in an extremely simple and intuitive way to implement a work program for a continuous automatic punching machine, simply by reproducing on an electronic medium by means of an assisted drawing program the repetitive motif to realize. Advantageously, the realization of said drawing occurs in a rectangular drawing area defined in said graphical user interface, said rectangular drawing area having a horizontal dimension corresponding to a distance in the cross direction between two consecutive specimens of said repetitive decorative motif and a vertical dimension equal to the pitch in the feed direction between two consecutive specimens of said repetitive decorative motif, said drawing being obtained by drawing in said rectangular drawing area a plurality of signs corresponding to points of the surface of the sheet material to be processed where a tool of said machine has to act.

[0036] Still advantageously, by means of said graphical user interface it is possible to set said horizontal and vertical dimensions of said rectangular drawing area and the shape and the size of said signs.

[0037] Still advantageously, in the machine the tool holder heads are arranged consecutively with the same orientation, each of them provided into said tool assembly for sliding in a cross direction (elongation direction of said tool-carrying bars), and by comprising cross direction drive means associated with each of said first and second tool holder heads adapted to drive the slide movement in said cross direction of each of said tool holder head, independently from one another; the abutment plane comprises: at least one first movable abutment member and at least a second movable abutment member each of said first and second movable abutment members being movable in said feed direction, independently of one

another, between an abutment position in which said movable abutment member is positioned to intercept tools of a respective tool holder head and a disengagement position in which said movable abutment member is positioned to not interfere with the stroke of tools of a respective tool holder head; and abutment member drive means suitable to actuate, independently of each other, said movable abutment members to move from said abutment position to said disengagement position and vice versa; computer numerical control means command, independently but in a coordinated manner, the advancement of said conveyor belt in said feed direction, the displacement in said cross direction of said first tool holder head, the displacement in said transverse direction of said second tool holder head, the selective displacement in the abutment position or the disengagement position of said first movable abutment member, the selective displacement in the abutment position or the disengagement position of said second movable abutment member, in a time-phased relation with the movement of said processing crosspiece in said work direction; with said computer program that is capable of processing said drawing of said specimen of a repetitive decorative motif for supplying to said numerical control means a work program needed for the realization of said decorative motif repetitive on a leather or similar sheet material being processed in said machine.

BRIEF DESCRIPTION OF DRAWINGS

[0038] These and other advantages and features of the machine of the present invention, will be immediately understood thanks to the following detailed description of a specific embodiment of the invention, provided purely as an example, but not limitative, with reference to the attached drawings, in which:

- figure 1 is a perspective view from the input side of a machine according to the invention;
- figure 2 is a schematic front view from the output side of the main components of the machine of fig. 1 ;
- figure 3 is a schematic side section view of the machine of fig. 1
- figure 4 is a front view of a tool assembly associated with the punching machine of Figures 1 to 3;
- figure 5 is an enlarged side section view of the processing section of the punching machine of Figures 1 to 3 which mounts the tool assembly of Fig. 4;
- figure 6 shows an enlarged view of a detail of Fig. 2;
- figure 7 shows an enlarged view of a detail of Fig. 5
- figure 8 is an explicative scheme for a processing method of a machine according to the invention that shows a repetitive decorative motif that can be obtained;
- figure 9 is an explicative scheme for a processing method of a machine according to the invention showing a specimen of the repetitive decorative motif of Fig. 8 sketched by means of a graphical user in-

terface of a computer program suitable to prepare the processing programs executable by computer numerical control means of a machine according to the invention;

- figure 10 shows a screenshot of a graphical user interface of a computer program suitable to prepare processing programs executable by computer numerical control means of a machine according to the invention;
- figures 11a and 11b show explicative schemes similar to that of fig. 9 for an alternative method of implementation of a working program for the machine of the invention executed by a graphical user interface of a computer program.

DESCRIPTION OF PREFERRED EMBODIMENTS

[0039] With reference to Figs. 1 to 3 it is shown as whole with 10 a continuous automatic punching machine for leather or similar material in sheets, and in particular suitable to execute operations of punching, die-cutting, cutting, engraving, holing or the like.

[0040] In Fig. 1, the continuous automatic punching machine 10 is represented in a perspective view in its complete configuration with casings and protections. In Figs. 2 and 3 are shown schematic views of the same continuous automatic punching machine 10 of which is shown only the mechanical structure and the main components, with omission of the protective casings, of electrical and electronic parts and other components which are not essential to the disclosure of the present invention. The structure of the machine comprises essentially two parallel side uprights, 12, 13, secured together, in this embodiment of the invention, by means of a lower shelf, 14, apt to support, inter alia, a workpiece support assembly, 200, and an upper fixed cross member, 15.

[0041] A processing crosspiece 30 is connected to the side uprights 12, 13 to slide vertically with respect to these by means of sliding guides, 31, being interposed between the upper fixed cross member 15 and the workpiece support assembly 200. Furthermore, the processing crosspiece passes through openings, 39, in the side uprights 12, 13 so to protrude outward from them. End members of the crosspiece 38 extend vertically to connect the processing crosspiece 30 to the drive members, 40, adapted to perform the reciprocating movement of the processing crosspiece 30 that constitutes the working movement in a work direction, Z. The drive members 40 comprise two thrust crank mechanisms placed externally to the side uprights 12, 13 where respective piston rods, 42, are each one pivotably jointed at one end to a corresponding end member of the crosspiece 38, and at the other end are eccentrically mounted to a rotatable shaft, 43, whose rotation is caused by an engine, 41.

[0042] As it is shown in the enlarged view of Fig. 5 of a processing section, 80, of the continuous automatic punching machine 10, the processing crosspiece 30 provides at its lower end constraint members, 36, adapted

to allow to securely associating to the processing crosspiece 30 a tool assembly, 100, shown in a partial front view in Fig. 4 too. The tool assembly 100 includes a support frame, 110, provided with removable connection means, 111, adapted to allow anchoring of the tool assembly 100 to the processing crosspiece 30, and further provided with at least a first, 112a, and a second, 112b, guide rails parallel to each other. By means of the above guide rails 112a, 112b to the support frame 110 are slidably connected a first, 150a, and a second tool holder head, 150b, each of which is associated with a guide rail 112a, 112b through corresponding slide members, 151a, 151b. The first 150a and second tool holder head 150b are arranged consecutively to each other in a feed direction, Y, and with a same spatial orientation, in particular in the embodiment represented the first 150a and second 150b tool holder head are aligned side by side to the same level in the work direction Z shown in Fig. 5 by a bidirectional vertical arrow. Each tool holder head comprises an elongated frame, 154a, 154b, which provides on one side connections means to respective slide member 151a, 151b while at a lower side it supports, preferably in a removable mode, a respective elongated tool-carrying bar, 152a, 152b, provided with one or more tools, 153a, 153b, arranged to protrude downwards from the respective tool-carrying bar 152a, 152b. In the embodiment shown, the tools 153a, 153b are arranged aligned in one row and evenly spaced with a predefined gap between the tools, I, in a cross direction, X, pointed with bidirectional horizontal arrow in Fig. 4, which is the direction of elongation of the tool-carrying bar 152a, 152b. The row of tools 153a, of the first tool-holder head 150a and the row of tools 153b of the second tool-holder head 150b are separated by a feed distance, D, in the feed direction Y corresponding in the embodiment shown to a distance between the gravity centers of the tool holder heads 150a, 150b.

[0043] Then the first and second tool holder heads 150a, 150b are able to slide with respect to the support frame 110 and therefore also with respect to the processing crosspiece 30 in the cross direction X.

[0044] Each tool holder head 150a, 150b is provided with sheet-pressing members, 160a, 160b, described in more detail with reference to the enlarged view of the tool-holder head 150a of Fig. 7. The sheet-pressing members 160a comprise a sheet-pressing plate, 161a, adapted to get in touch with the sheet material to be processed, and elastic connection means 165a, suitable to be inserted into a housing, 155a, of the elongated frame 154a to connect the sheet-pressing plate 161a with the same elongated frame 154a in sliding mode in a direction perpendicular to the plane of the lower sheet-pressing plate 161a, that is in the work direction Z. The elastic connection means 165a, in the shown embodiment composed of pins, 166a, and compression springs, 167a exert an elastic action such as to maintain a maximum distance between the sheet-pressing plate 161a and the elongated frame 154a and so the tool-carrying bars 152a

integral therewith. As in conventional applications, the sheet-pressing members 160a, 160b are useful to maintain in stretched out configuration the sheet material being processed and to adjust the work force that the tools 153a, 153b exerts on the sheet material.

[0045] Cross-direction drive means, 170, are associated with each tool holder head 150a, 150b, adapted to drive the slide movement in the cross direction X of each tool holder head 150a, 150b independently from one another. In the represented embodiment, the cross-direction drive means 170 comprise screw-nut screw connection members, 171, and actuating means, 172, below described with reference to Fig. 4 and 6 for the first tool holder head 150a, likewise it is to be understood that identical members are associated with the second tool holder head 150b. At one end of the tool holder head 150a, in particular at the left end according to the front view of Fig. 2, it is bound and placed with its axis parallel to the cross direction X a nut-screw member, 173, which protrudes outwardly from the tool holder head and it is engaged by a screw member, 174a, which is coaxial to a rotating output shaft of an electric gearmotor, 175a, whose body is integral to the wall of the end member of the crosspiece 38, so moving integrally with the processing crosspiece 30. Consequently, the electric gearmotor 175a moves integrally with the tool holder head 150a in the work direction Z and as a result of its drive, a sliding movement in the cross direction X is transmitted to the tool holder head. The electric gearmotor 175a associated with the first tool holder head 150a is controlled in a way totally independent from a corresponding second electric gearmotor associated with the second tool holder head 150b so that the movements in cross direction X of the tool-holder heads 150a, 150b, are completely independent from one other. Advantageously, each of the electric gearmotors 175a, 175b is controlled to move the respective tool holder head 150a, 150b by a cross direction stroke at least equal to the gap between consecutive tools I, so to be able to process any point between a first tool (the leftmost one) and a last tool (the right-most one) 153a of the row of tools of which the tool holder head 150a is provided. The setup of the cross direction drive members 170, of course, could be very different from that one described above by way of example. For example, an advantageous option might provide for actuating means 172 bound to the support frame 110 of the tool assembly 100 instead of to the machine members. Thereby, the drive group for moving in the cross direction X the tool holder heads 150a, 150b, would be integral to the tool assembly, 100, so that this last could be installed for providing the movement of the tool-holder heads 150a, 150b along the cross direction X also in machines not designed for this operation.

[0046] With reference to Figs. 1 to 3 again, a conveyor assembly 70, comprises a conveyor belt 71, which unwinds from an unwind roll, 72, mounted on an unwinding roller, 73, placed with its axis horizontal at the input side of the continuous automatic punching machine 10, in un-

wound configuration passes through the processing section, 80, of the machine between the tool holder head 150a, 150b and the workpiece support assembly 200, and then it is rewound on a rewind roll, 74, mounted on a winding roller, 75, disposed with its axis horizontal at the output side of the continuous automatic punching machine 10. The workpieces, P, to be processed are loaded in a unwound configuration on the conveyor belt 71 in a part of it in which it runs horizontal at the input side of the continuous automatic punching machine 10 so as to identify a loading surface, C. The advancement of the conveyor belt moves the sheet material workpiece P to the processing section 80 in which the conveyor belt lies above the workpiece support assembly 200. The feed movement of the conveyor belt 71 above the workpiece support assembly 200 in correspondence with the processing section 80 identifies a feed direction, Y, which in the embodiment shown is orthogonal both to the work direction Z and the cross direction X. After processed, the further advancement of the conveyor belt 71 moves the sheet materials workpiece P to be discharged on a discharge tray, S, suitably arranged at the output side, or discharge side, of the continuous automatic punching machine 10. In order to let the conveyor belt perform the path described above, the conveyor assembly 70 shown in Figs. 1 and 3 obviously comprises pulling means, deflection rollers, support rollers, tensioners and support brackets, schematically represented but not indicated with numerical references as of substantially known technique. In addition, as it can be seen, in Fig. 2, the conveyor assembly 70 has been completely omitted in order to make even more visible and intelligible the other components of the machine described above.

[0047] With reference now again to Fig. 5, the workpiece support assembly 200 comprises one or more support assemblies adjustable in the vertical direction and each comprising a lower sloped plane member, 210, an upper sloped plane member 220, and means for adjusting the work depth, 230, through which, if it is varied the horizontal position of the lower sloped plane member 210 it is changed also the position in height of the upper sloped plane member 220 and therefore the position of an abutment member, 240, supported by it. As mentioned, there can be a single workpiece support assembly 200 extending transversely over the entire length in the cross direction X of the machine, between the side uprights 12, 13, or may be multiple support assemblies transversely placed side by side to allow for more independent adjustment of the work depth in respective cross sections of the machine. The abutment member 240 in its upper section comprises an abutment plane, 260, which extends below the tool holder heads 150a, 150b in correspondence of the latter.

[0048] The abutment plane 260 comprises a first movable abutment member, 261a, and a second movable abutment member, 261b, each of said movable abutment members being movable in the feed direction Y, independently of one another, between an abutment position

in which said movable abutment member 261a, 261b is positioned to intercept the tools 153a, 153b of a respective tool holder head 150a, 150b, and a disengagement position in which the movable abutment member 261a, 261b is positioned to not interfere with the working stroke of the tools 153a, 153b of the respective tool holder head 150a, 150b. Exactly, in the configuration shown in Fig. 5, the first movable abutment member 261a is placed in the abutment position while the second movable abutment member 261b is placed in the position of disengagement. Abutment member drive means, 262a, 262b are expected to actuate, independently of each other, each of the movable abutment members 261a, 261b to move from the abutment position to the disengagement position and vice versa. More in detail, the abutment member 240 includes a fixed abutment portion, 263, a first housing, 264a, for the housing of the first movable abutment member 261a and a second housing, 264b, for the housing of the second movable abutment member, 261b, with the first and second housings 264a, 264b, configured and sized to allow the sliding of the respective movable abutment member along the feed direction Y between two end stroke positions corresponding to the abutment position and the disengagement position. The upper surface of the movable abutment members 261a, 261b is flat and coplanar with the upper surface of the fixed abutment portion 263. The abutment member drive means 262a, 262b, comprise fluidic linear actuators arranged outside the abutment member at the discharge side and at the load side, respectively.

[0049] The processing methods of the continuous automatic punching machine described above are innovative for this type of machine and will be described hereinafter with reference also to Figs. 8 to 12. In Fig. 8 it is shown a repetitive decorative motif, M, which can be obtained by a continuous automatic punching machine 10 according to the invention by means of a tool assembly 100, of which in Fig. 8 is schematically shown the first tool holder head 150a, with the corresponding punching tools 153 arranged aligned on a single row extending along the cross direction X, evenly spaced with a certain gap between consecutive tools, I. In the machine described above, in order to obtain the repetitive decorative motif M, each tool 153a, performs a specimen, F, of the repetitive decorative motif M, represented in Fig. 9, by performing sequentially, one for each stroke, punched marks, f, shown in Figure 9. Specifically, the operation occurs by obtaining, through subsequent movements in the cross direction X of the tool holder head 150a, the punched marks f which are placed at level y0 in the feed direction Y, then the conveyor belt is moved to the level y1 and the punched marks f placed at level y1 are performed sequentially, through subsequent movements of the tool holder head in the cross direction X, one for each processing stroke, and so on until the level yn.

[0050] The other tools 153a, of the tool holder heads 150a mounted with a gap between consecutive tools I equal to the distance between two consecutive speci-

mens F alongside the repetitive decorative motif M, perform in their area further specimens F that are in a line of specimens forming an overall width L of the repetitive decorative motif M. Furthermore, the continuous automatic punching machine 10 of the invention is provided with a computer numerical control means through which is executed in sequence, without interruption, the working program defined above for the single specimen F, so as to obtain the repetitive decorative motif M on the sheet material workpiece P to be processed.

[0051] What described above is obtained with the configuration of the workpiece support assembly 200 shown in Fig. 1, in which the first element of the movable abutment member 261a is arranged in correspondence with the first tool holder head 150a and placed in the abutment position, while the second movable abutment member 261b is placed in correspondence with the second tool holder head 150b and placed at the disengagement position, so that in this configuration, the working stroke of the processing crosspiece 30 causes a processing on the sheet material workpiece P by first tool holder head 150a but not by second tool holder head 150b.

[0052] More in general, the computer numerical control means are able to control independently but in a coordinated manner, in order to perform a given punching program, the supply movement of the conveyor belt in the feed direction Y, the displacement in the cross direction X of the first tool holder head 150a, the displacement in the cross direction X of the second tool holder head 150b, the selective displacement in the abutment position and in the disengagement position of the first movable abutment member 261a, the selective displacement in the abutment position and in disengagement position of the second movable abutment member 261a, in a time-phased relation with the movement of the processing crosspiece 30 (and so of the tools 153a, 153b) in the work direction Z.

[0053] According to a method of the present invention, the working program executed by the continuous automatic punching machine 10 through the corresponding computer numerical control means is arranged by a computer program in which by means of a graphical user interface is provided a drawing consisting of plurality of marks composing a specimen F of the repetitive decorative motif M to be obtained.

[0054] With reference to Fig. 10, showing a screenshot of a computer program through which is arranged a working program for the continuous automatic punching machine 10, the above drawing is performed in a rectangular drawing area, R, defined in a graphical user interface of the computer program. The horizontal and vertical dimension of the rectangular drawing area R are defined by entering two parameters respectively corresponding to a pitch I in the cross direction X between two consecutive specimens F of the repetitive decorative motif M and to a second pitch A in the feed direction Y between two consecutive specimens F of the repetitive decorative motif M. In the rectangular drawing area R are plotted a

plurality of marks, S, advantageously, moving a pointer to the desired point and confirming the insertion of a mark S in this position, corresponding to points of the surface of the sheet material workpiece P to be processed where a tool 153a, 153b of said continuous automatic punching machine 10 has to act.

[0055] Either, the drawing consisting of a plurality of marks S of a specimen F of the decorative motif M is obtained by importing in the computer program a file in graphical format, and said computer program, through appropriate processing algorithms, is able to perform a conversion of the file in graphic format into a plurality of marks S in the rectangular drawing area R, which constitutes the specimen F.

[0056] The computer program comprising the graphical user interface described above interprets the drawing executed in the rectangular drawing area R and then the computer program is able to process the drawing and other setups, such as the speed of the processing cross-piece, to provide to the computer numerical control means a working program where are defined the movements in the cross direction X of the tool holder heads 150a, 150b, and the feed motion Y of the sheet material to be processed P.

[0057] The size and shape of the marks S is previously defined to correspond to the size and shape of the tool 153a, 153b, or more exactly to the size and shape of the cut that tool is designed to trace on the sheet material workpiece P to be processed.

[0058] Furthermore, the computer program through which is arranged the working program for the continuous automatic punching machine 10 is able to manage in an extremely easy and effective way the tool assembly 100 provided with more tool holder heads 150a, 150b, and workpiece support assembly 200 provided with more corresponding movable abutment members 261a, 261b. In fact, the graphical user interface of the computer program provides the possibility to create and manage a number of layers, or overlapping drawing sheets, equal to the number of tool holder heads 150a, 150b and the number of corresponding movable abutment members 261a, 261b, each layer, or overlapping sheet, being associated with a tool holder head.

[0059] In the represented embodiment of the invention, the computer program provides for a layer 1 associated with the first tool holder head 150a, and a layer 2 associated with the second tool holder head 150b. The previously described method for realizing the repetitive decorative motif M of Fig. 4 provides for drawing in the rectangular drawing area R of layer 1 a specimen F of the repetitive decorative motif F and not to draw any mark in the second layer. The computer program has to process the drawing data into information of a working program according to which the first movable abutment member 261 is always stopped in the abutment position and second movable abutment member 261b is always stopped in the disengagement position, and the first tool holder head 150a between one stroke and the next one is dis-

placed in the cross direction X, and the sheet material workpiece P is advanced in the feed direction Y, so as to perform all the marks f which form a specimen F of the repetitive decorative motif M to be worked. In this way, the second tool holder head 150b is not used. Alternative mode of implementation provides the using of both tool holder heads 150a, 150b, for example as shown in Figs. 11a and 11b. In this, half of the marks f (right half) are drawn on layer 1 producing a first portion of specimen Fa, and the remaining half of the marks f (left half) are drawn on the layer 2 producing a second portion of specimen Fb. In the graphical user interface of the computer program the two layers are overlapped, with rectangular drawing areas R perfectly overlapped and which, as in most of CAD drawing programs are selectively activated and selectively or simultaneously viewable. The computer program has to process the drawings into information of a working program for the continuous automatic punching machine 10 in which the first tool holder head 150a is displaced in the cross direction X to perform the working points corresponding to the marks f (right half) of its layer 1 meanwhile, independently, the second tool holder head is displaced to perform the working points corresponding to the marks f (left half) of its layer 2. In particular, the machining program has to consider that although the layer 1 and layer 2 are overlapped in the graphical user interface, the tool holder heads 150a and 150b are offset in the feed direction Y by their feed distance D.

[0060] In addition, the working program processed according to the drawings executed in the graphical user interface contains control information about the position of the movable abutment members 261a, 261b, as if, according to the drawings in layer 1 and layer 2, in correspondence of a specific level y in which at least one mark f has to be performed, the relative movable abutment members 261a, 261b has to be switched to the abutment position, otherwise it has to be switched to the disengagement position.

[0061] The advantages related to the processing method described above in a continuous automatic punching machine are immediately obvious, especially about the versatility and easiness of programming. In fact, the machine programming is performed simply by reproducing for points on a graphical user interface of a computer program a repetitive decorative motif M to be realized on a leather workpiece P or other similar sheet material. The conversion of the drawing in a work program of the machine is automatic at all. Furthermore, in the event that the continuous automatic punching machine 10 provides several tool holder heads 150a, 150b, and respective movable abutment members 261a, 261b, as in the example shown and described, it is achievable a same repetitive decorative motif M in different ways, such as the one shown in Fig. 9 and the one shown in Fig. 11. In the first case, the advantage consists in not preparing and installing the second tool holder head 150b, while in the second case the advantage is the doubling of the pro-

ductivity of the machine.

[0062] The embodiments described above of both a continuous automatic punching machine according to the invention and the processing method of said machine, have peculiar advantages and features such as those indicated above, however, variants of and different embodiments can of course be expected while remaining within the inventive concept of the present invention.

[0063] For example, it may be different the number of tool holder heads associated with a tool assembly 100 according to the present invention and each tool holder head may mount different tools both as morphology of the single tool and as the placement along the corresponding tool-carrying bar. For example, a first tool holder head may mount tools suitable to perform round openings, while a second tool holder head may mount tools suitable to perform elongated cuts.

[0064] The conveyor assembly may be of different types and arranged to unwind according to different paths than the one shown by way of example in Figures 1 and 3.

[0065] The abutment plane 260 may be made of steel or another material and maintaining a substantially rigid behaviour under the effect of forces that the processing crosspiece 30 exerts through the tools 153s, 153b, or alternatively it may be provided with a high resilience covering able to partially absorb the cutting forces applied by the tool.

[0066] From the point of view of the manufacturing method, the gap between two consecutive tools I in the tool-carrying bar 152a, 152b, may be a multiple of the distance in the cross direction X between two consecutive specimens F of the repetitive decorative motif M, and each tool 153 may then be assigned of performing on the sheet material workpiece P several recurrences, placed side by side in the cross direction X, of a specimen F of the repetitive decorative motif M.

[0067] Other changes and variations may obviously be made to what is described as an example, without going beyond the scope of protection for the inventive idea as claimed below.

Claims

1. Continuous automatic punching machine (10) of the type suitable to perform operations of punching, die-cutting, cutting, engraving, holing or the like on leather workpieces (P) or similar sheet materials, comprising:

- at least two side uprights (12, 13),
- a processing crosspiece (30) mounted on said at least two side uprights (12, 13) in sliding mode,
- said processing crosspiece (30) being inferiorly integral with a tool assembly (100),
- drive members (40) of said processing crosspiece (30) to cause its sliding with respect to

said side uprights (12, 13) so as to make it perform a reciprocating movement which is a work movement of said tool assembly (100) in a work direction (Z),

- a workpiece support assembly (200) positioned below said tool assembly and comprising an abutment plane (260),
- a conveyor assembly (70) comprising a conveyor belt (71) arranged to pass in a unwound configuration above said abutment plane (260),
- a processing section (80) of said continuous automatic punching machine (10) between said tool assembly (100) and said abutment plane (260), with a leather workpiece (P) or similar sheet material to be processed that is supplied to said processing section (80) lying on said conveyor belt (71) in a feed direction (Y),

said continuous automatic punching machine (10) being **characterized in that** said tool assembly (100) comprises at least a first (150a) and a second (150b) tool holder head each comprising an elongated tool-carrying bar (152a, 152b) which is elongated in a cross direction (X) and provided with a plurality of tools (153a, 153b) arranged to protrude from said tool-carrying bar (152a, 152b), said first (150a) and a second (150b) tool holder head being arranged consecutively in a feed direction (Y) with the same spatial orientation, each of said first (150a) and second (150b) tool holder head being provided into said tool assembly (100) for sliding in said cross direction (X), and by comprising cross direction drive means (170) associated with each of said first (150a) and second (150b) tool holder heads adapted to drive the slide movement in said cross direction (X) of each of said tool holder head (150a, 150b), independently from one another.

2. Continuous automatic punching machine (10) according to claim 1, **characterized in that** said tool assembly (100) comprises a support frame (110) provided with removable connection means (111) adapted to allow anchoring of said tool assembly (100) to said processing crosspiece (30), and further provided with at least a first (112a) and a second (112b) guide rails parallel to each other, each of said at least a first (150a) and second (150b) tool holder head being associated with a respective first (112a) and second (112b) guide rail through a corresponding slide member (151a, 151b).

3. Continuous automatic punching machine (10) according to claim 1, **characterized in that** each of said at least a first (150a) and second (150b) tool holder head comprises an elongated frame (154a, 154b) in which a work side can be identified where are formed a coupling seat for said tool-carrying bar (152a, 152b) and housings (155a) for a sheet-press-

ing member (160a, 160b) comprising a sheet-pressing plate (161a) and elastic connection means (165a) adapted to be inserted into said housings (155a) for connecting said sheet-pressing plate (161a) with said elongated frame (154a, 154b) in sliding mode in a direction perpendicular to the plane of said sheet-pressing plate (161a) and with an elastic action such as to maintain the maximum distance between said sheet-pressing plate (161a) and said elongated frame (154a, 154b).

4. Continuous automatic punching machine (10) according to claim 1, **characterized in that** said abutment plane (260) comprises: at least one first movable abutment member (261a) and at least a second movable abutment member (261b) each of said first (261a) and second (261b) movable abutment members being movable in the direction of said feed direction (Y), independently of one another, between an abutment position in which said movable abutment member (261a, 261b) is positioned to intercept tools (153a, 153b) of a respective tool holder head (150a, 150b) and a disengagement position in which said movable abutment member (261a, 261b) is positioned to not interfere with the stroke of said tools (153a, 153b); and abutment member drive means (262a, 262b) suitable to actuate, independently of each other, said movable abutment members (261a, 261b) to move from said abutment position to said disengagement position and vice versa.
5. Continuous automatic punching machine (10) according to the preceding claim **characterized in that** said abutment plane (260) comprises a fixed support portion providing at least a first housing (264a) for housing said first movable abutment member (261a) and at least a second housing (264b) for housing said second movable abutment member (261b), said at least a first (264a) and second (264b) housings being configured and dimensioned to allow the sliding of the respective movable abutment member (261a, 261b) along said feed direction (Y) between two end stroke positions corresponding to said abutment position and said disengagement position.
6. Continuous automatic punching machine (10) according to claim 4 or 5, **characterized in that** said abutment plane (260) includes a fixed abutment portion (263), the upper surface of said movable abutment members (261a, 261b) being flat and coplanar with the upper surface of said fixed abutment portion (263).
7. Continuous automatic punching machine (10) according to claim 4 or followings **characterized in that** it comprises computer numerical control means capable of controlling, independently but in a coordinated manner, in order to perform a given punching

program, the supply movement of said conveyor belt (71) in said feed direction (Y), the selective displacement in said abutment position and in said disengagement position of said first movable abutment member (261a), the selective displacement in said abutment position and in said disengagement position of said second movable abutment member (261b), in a time-phased relation with the movement of said processing crosspiece (30) in said work direction (Z).

8. Continuous automatic punching machine (10) according to claim 4 or followings, **characterized in that** said workpiece support assembly (200) is provided with means (230) for adjusting the work depth.
9. Method for producing motifs on leather workpieces (P) or similar material in sheets or tape by means of a continuous automatic punching machine (10) of the type suitable to perform operations of punching, die cutting, slitting, cutting, holing, or the like, said continuous automatic punching machine (10) comprising:
 - a processing crosspiece (30) to which is inferiorly integral a tool assembly (100) comprising at least a first (150a) and a second (150b) tool holder head connected to said tool assembly (100) for sliding in a cross direction (X) of said tool holder head (150a, 150b), and cross-direction drive means (170) associated with said first and second tool holder head (150a, 150b) adapted to drive the first and second tool holder head (150a, 150b) slide movement in said cross direction (X), independently from one another,
 - drive members (40) of said processing crosspiece (30) to cause a reciprocating movement which is a work movement of said tool assembly (100) in a work direction (Z),
 - a workpiece support assembly (200) mounted below said tool assembly (100) in correspondence to the latter and comprising an abutment plane (260),
 - a conveyor assembly (70) comprising a conveyor belt (71) arranged to pass in an unwound configuration above said abutment plane (260), a processing section (80) of said continuous automatic punching machine (10) between said tool assembly (100) and said abutment plane (260) in a feed direction (Y), and supply means to determine the advancement of said conveyor belt so as to make said leather or similar material in sheets or tape (P) to be processed pass through said processing section (80),
 - computer numerical control means of said machine suitable for controlling said drive means (40), said supply means of the conveyor belt (71) and said cross direction drive means (170), as

a function of punching programs executable by said machine,

said method comprising:

- the realization, through a graphical user interface of a computer program, of a drawing consisting of a plurality of signs (S) that represents a specimen (F) of a repetitive decorative motif (M) to be obtained on a sheet material workpiece (P) to be processed,
- the conversion of said drawing in a work program of said continuous automatic punching machine (10),
- the automatic execution of said work program by said numerical control means,

said method being **characterized in that** said graphical user interface of said computer program provides for the possibility to produce and manage a number of layers or drawing sheets equal to the number of said tool-holder heads (150a, 150b), each layer or drawing sheet being associated with one of said tool-holder heads (150a, 150b).

10. Method according to claim 9 characterized in that:

- said abutment plane (260) comprises: at least one first movable abutment member (261a) and at least a second movable abutment member (261b), each of said first (261a) and second (261b) movable abutment members being movable in said feed direction (Y), independently of one another, between an abutment position in which said movable abutment member (261a, 261b) is positioned to intercept tools (153a, 153b) of a respective tool holder head (150a, 150b) and a disengagement position in which said movable abutment member (261a, 261b) is positioned to not interfere with the stroke of tools (153a, 153b) of a respective tool holder head (150a, 150b); and abutment member drive means (262a, 262b) suitable to actuate, independently of each other, said movable abutment members (261a, 261b) to move from said abutment position to said disengagement position and vice versa,
- said numerical control means command, independently but in a coordinated manner, the advancement of said conveyor belt (71) in said feed direction (Y), the displacement in said cross direction (X) of said first tool holder head (150a), the displacement in said cross direction (X) of said second tool holder head (150b), the selective displacement in the abutment position or the disengagement position of said first movable abutment member (261a), the selective displacement in the abutment position or the dis-

engagement position of said second movable abutment member (261b), in a time-phased relation with the movement of said processing crosspiece (30) in said work direction (Z),

- said computer program is capable of processing said drawing of said specimen (F) of a repetitive decorative motif (M) to be realized for supplying to said numerical control means a work program necessary for the realization of said decorative motif repetitive (M) on a leather workpiece (P) or similar sheet material being processed in said continuous automatic punching machine (10).

11. Method according to claim 9 or 10, characterized in that the realization of said drawing occurs in a rectangular drawing area (R) defined in said graphical user interface, said rectangular drawing area (R) having a horizontal dimension corresponding to a distance (l) in the cross direction (X) between two consecutive specimens (F) of said repetitive decorative motif (M) and a vertical dimension equal to the pitch (A) in the feed direction (Y) between two consecutive specimens (F) of said repetitive decorative motif (M), said drawing being obtained by drawing in said rectangular drawing area a plurality of signs (S) corresponding to points of the surface of the sheet material (P) to be processed where a tool (153a, 153b) of said continuous automatic punching machine (10) has to act.

12. Method according to the preceding claim, characterized in that through said graphical user interface are defined said horizontal and vertical dimensions of said rectangular drawing area (R).

13. Method according to claim 9 or followings characterized in that said drawing consisting of a plurality of signs (S) is obtained by importing in said computer program a file in a graphic format, said computer program performing a conversion of said file in graphic format into a plurality of signs (S) of said rectangular drawing area (R).

Patentansprüche

1. Kontinuierliche automatische Stanzmaschine (10) des Typs, der geeignet ist, um Operationen zum Stanzen, Ausstanzen, Schneiden, Gravieren, Lochen oder dergleichen an den Lederwerkstücken (P) oder ähnlichen Plattenmaterialien durchzuführen, umfassend

- mindestens zwei Pfosten (12, 13),
- einen Bearbeitungssteg (30), der an den mindestens zwei Pfosten (12, 13) so angebracht ist, dass er gleiten kann.

- wobei der Bearbeitungssteg (30) unten mit einer Werkzeuganordnung (100) versehen ist,
- Antriebsmittel (40) des Bearbeitungsstegs (30), die vorgesehen sind, um den Bearbeitungssteg in Bezug auf die Pfosten (12, 13) so zu verschieben, dass er eine Hin- und Herbewegung ausführt, die auch eine Arbeitsbewegung der Werkzeuganordnung (100) in einer Arbeitsrichtung (Z) ist,
- eine Werkstückträgeranordnung (200), die unterhalb der Werkzeuganordnung positioniert ist und eine Widerlagerebene (260) umfasst,
- eine Förderanordnung (70) mit einem Förderband (71), das so angeordnet ist, dass es in einer abgewinkelten Konfiguration über der Widerlagerebene (260) verläuft.
- einen Bearbeitungsabschnitt (80) der kontinuierlichen automatischen Stanzmaschine (10), der sich zwischen der Werkzeuganordnung (100) und der Widerlagerebene (260) befindet, wobei dem Bearbeitungsabschnitt (80) ein Lederwerkstück (P) oder ähnliches zu bearbeitendes Blattmaterial zugeführt wird und in einer Vorschubrichtung (Y) auf dem Förderband (71) liegt,

wobei die Kontinuierliche automatische Stanzmaschine (10) **dadurch gekennzeichnet ist daß** die Werkzeuganordnung (100) umfasst mindestens einen ersten (150a) und einen zweiten (150b) Werkzeughalterkopf, wobei jeder Kopf eine längliche werkzeugtragende Stange (152a, 152b) umfasst, die in Querrichtung (X) verlängert und mit einer Vielzahl von Werkzeugen (153a, 153b) versehen ist, die so angeordnet sind, dass sie aus der werkzeugtragenden Stange (152a, 152b) herausragen, wobei der erste (150a) und ein zweiter (150b) Werkzeughalterkopf nacheinander in einer Vorschubrichtung (Y) mit der gleichen räumlichen Ausrichtung angeordnet sind, jeder der ersten (150a) und zweiten (150b) Werkzeughalterköpfe in der Werkzeuganordnung (100) zum Verschieben in Querrichtung (X) vorgesehen ist. und indem sie umfasst Querrichtungsantriebsmittel (170), die jedem der ersten (150a) und zweiten (150b) Werkzeughalterköpfe zugeordnet sind, um die angepasst sind, um die Schlittenbewegung in der Querrichtung (X) jedes der Werkzeughalterköpfe (150a, 150b) unabhängig voneinander zu steuern.

2. Kontinuierliche automatische Stanzmaschine (10) nach Anspruch 1, **dadurch gekennzeichnet daß** die Werkzeuganordnung (100) einen Tragrahmen (110) umfasst, der mit abnehmbaren Verbindungsmitteln (111) versehen ist, die so angepasst sind, dass sie die Verankerung der Werkzeuganordnung (100) an dem Bearbeitungssteg (30) ermöglichen, und wobei die ferner mit mindestens einer ersten

(112a) und einer zweiten (112b) Führungsschiene parallel zueinander versehen ist, wobei jeder der mindestens einen ersten (150a) und zweiten (150b) Werkzeughalterköpfe einer jeweiligen ersten (112a) und zweiten (112b) Führungsschiene durch ein entsprechendes Gleitelement (151a, 151b) zugeordnet ist.

3. Kontinuierliche automatische Stanzmaschine (10) nach Anspruch 1, **dadurch gekennzeichnet daß** jeder der mindestens einen ersten (150a) und zweiten (150b) Werkzeughalterköpfe einen länglichen Rahmen (154a, 154b) mit einer Arbeitsseite mit einem Kupplungssitz für die Werkzeugträgerstange (152a, 152b) und Gehäusen (155a) für ein Blattpresselement (160a, 160b) umfasst, wobei das Blattpresselement eine Blattpressplatte (161a) und elastische Verbindungsmittel (165a) umfasst, die in der Gehäusen (155a) zum Verbinden der Blattpressplatte (161a) mit dem länglichen Rahmen (154a, 154b) einsetzbar sind, so dass sie in eine Richtung senkrecht zur Ebene der Blattpressplatte (161a) verschiebbar sind und mit einer elastischen Wirkung, um den maximalen Abstand zwischen der Blattpressplatte (161a) und dem länglichen Rahmen (154a, 154b) einzuhalten.

4. Kontinuierliche automatische Stanzmaschine (10) nach Anspruch 1, **dadurch gekennzeichnet daß** die Widerlagerebene (260) umfasst: mindestens ein erstes bewegliches Anschlagelement (261a) und mindestens ein zweites bewegliches Anschlagelement (261b), wobei jedes der ersten (261a) und zweiten (261b) beweglichen Anschlagelemente unabhängig voneinander in Richtung der Vorschubrichtung (Y) beweglich ist, und zwar zwischen einer Anschlagposition, in der das bewegliche Anschlagelement (261a, 261b) positioniert ist, um Werkzeuge (153a, 153b) eines jeweiligen Werkzeughalterkopfes (150a, 150b) abzufangen, und einer Ausrückposition, in der das bewegliche Anschlagelement (261a, 261b) so positioniert ist, dass es den Hub der Werkzeuge (153a, 153b) nicht stört; und Anschlag-elemente-Antriebsmittel (262a, 262b) die geeignet sind, um die beweglichen Anschlagelemente (261a, 261b) unabhängig voneinander zu betätigen, um sich von der Anschlagposition in die Ausrückposition und umgekehrt zu bewegen.

5. Kontinuierliche automatische Stanzmaschine (10) nach dem vorigen Anspruch, **dadurch gekennzeichnet daß** die Widerlagerebene (260) einen festen Stützabschnitt umfasst, der mindestens ein erstes Gehäuse (264a) zur Aufnahme des ersten beweglichen Anschlagelements (261a) und mindestens ein zweites Gehäuse (264b) zur Aufnahme des zweiten beweglichen Anschlagelements (261b) bereitstellt, wobei das erste (264a) und zweite (264b)

Gehäuse konfiguriert und dimensioniert sind, um das Gleiten des jeweiligen beweglichen Anschlagelements (261a, 261b) entlang der Vorschubrichtung (Y) zu ermöglichen, um zwar zwischen zwei Endhubpositionen, die der Anschlagposition und der Ausrückposition entsprechen.

6. Kontinuierliche automatische Stanzmaschine (10) nach Anspruch 4 oder 5, **dadurch gekennzeichnet daß** die Widerlagerebene 260 einen festen Widerlagerabschnitt (263) beinhaltet, wobei die Oberseite der beweglichen Anschlagelemente (261a, 261b) flach und koplanar mit der Oberseite des festen Widerlagerabschnitts (263) ist.
7. Kontinuierliche automatische Stanzmaschine (10) nach Anspruch 4 oder den folgenden, **dadurch gekennzeichnet daß** die computergestützte numerische Steuermittel umfasst, die in der Lage sind, unabhängig, aber koordiniert und gemäß eines gegebenen Stanzprogramm, die Zuführbewegung des Förderbandes (71) in Vorschubrichtung (Y), die selektive Verschiebung in der Anschlagposition und in der Ausrückposition des ersten beweglichen Anschlagelements (261a), die selektive Verschiebung in der Anschlagposition und in der Ausrückposition des zweiten beweglichen Anschlagelement (262a), in einer zeitlichen Beziehung mit der Bewegung des Bearbeitungssteiges (30) in Arbeitsrichtung (Z) durchzuführen.
8. Kontinuierliche automatische Stanzmaschine (10) nach Anspruch 4 oder den folgenden, **dadurch gekennzeichnet daß** die Werkstückträgeranordnung (200) mit Mitteln (230) zum Einstellen der Arbeitstiefe versehen ist.
9. Verfahren zur Herstellung von Motiven auf Leder (P) oder ähnlichem Material in Platten oder Bändern mittels einer Kontinuierlichen automatischen Stanzmaschine (10) des Typs, der geeignet ist, um Operationen zum Stanzen, Ausstanzen, Schneiden, schnitzen, Löchern oder dergleichen durchzuführen, umfassend:
 - einen Bearbeitungssteg (30) der unten mit einer Werkzeuganordnung (100) versehen ist, die mindestens einen ersten (150a) und einen zweiten (150b) Werkzeughalterkopf umfasst, die mit der Werkzeuganordnung (100) verbunden sind, um in einer Dehnungsrichtung (X) des Werkzeughalterkopfes (150a, 150b) und unabhängig voneinander zu gleiten, Querrichtungsantriebsmittel (170), die dem ersten Werkzeughalterkopf (150a, 150b) zugeordnet sind und die so ausgelegt sind, dass sie ihre Schlittenbewegung in Dehnungsrichtung (X) unabhängig voneinander antreiben,

- Antriebselemente (40) des Bearbeitungssteiges (30), die vorgesehen sind, um eine hin- und hergehende Bewegung zu bewirken, die eine Arbeitsbewegung der Werkzeuganordnung (100) in Richtung einer Arbeitsachse (Z) ist,
- eine Werkstückträgeranordnung (200), die unterhalb der Werkzeuganordnung (100) entsprechend dieser angeordnet ist und eine Widerlagerebene (260) umfasst,
- eine Förderanordnung (70) mit einem Förderband (71), das so angeordnet ist, dass es in einer abgewinkelten Konfiguration über der Widerlagerebene (260) verläuft,
- einen Bearbeitungsabschnitt (80) der kontinuierlichen automatischen Stanzmaschine (10), der sich zwischen der Werkzeuganordnung (100) und der Widerlagerebene (260) in einer Vorschubrichtung befindet, und Zuführmittel zum Bestimmen des Fortschritts des Förderbandes, um das zu verarbeitenden Leder oder ähnliche Material in Blatten oder Bändern (P) durch den Bearbeitungsabschnitt (80) laufen zu lassen,
- computergestützte numerische Steuermittel der Maschine, geeignet zum Steuern der Antriebsmittel (40), die Zuführmittel des Förderbandes (71) und der Querantriebsmittel (170) in Abhängigkeit von den von der Maschine ausführbaren Stanzprogrammen,

wobei das Verfahren umfasst:

- die Realisierung einer Zeichnung über eine grafische Benutzeroberfläche eines Computerprogramms, die aus einer Vielzahl von Zeichen (S) besteht, die ein Muster (F) eines sich wiederholenden dekorativen Motivs (M) darstellt, das auf einem zu bearbeitenden Werkstück (P) aus Blattmaterial erhalten werden soll,
- die Umsetzung der Zeichnung in ein Arbeitsprogramm der kontinuierlichen automatischen Stanzmaschine (10),
- die automatische Ausführung des Arbeitsprogramms durch die numerischen Steuermittel,

wobei das Verfahren **dadurch gekennzeichnet ist, daß** die grafische Benutzeroberfläche des Computerprogramms die Möglichkeit bietet, eine Anzahl von Schichten oder Zeichenblättern zu erzeugen und zu verwalten, die der Anzahl der Werkzeughalterköpfe (150a, 150b) entspricht, wobei jede Schicht oder jedes Zeichenblatt einem der Werkzeughalterköpfe (150a, 150b) zugeordnet ist.

10. Verfahren nach Anspruch 9, **dadurch gekennzeichnet daß**:

- die Widerlagerebene (260) umfasst: mindes-

tens ein erstes bewegliches Anschlagelement (261a) und mindestens ein zweites bewegliches Anschlagelement (261b), wobei jedes der ersten (261a) und zweiten (261b) beweglichen Anschlagelemente unabhängig voneinander in Richtung der Vorschubrichtung (Y) beweglich ist, und zwar zwischen einer Anschlagposition, in der das bewegliche Anschlagelement (261a, 261b) positioniert ist, um Werkzeuge (153a, 153b) eines jeweiligen Werkzeughalterkopfes (150a, 150b) abzufangen, und einer Ausrückposition, in der das bewegliche Anschlagelement (261a, 261b) so positioniert ist, dass es den Hub der Werkzeuge (153a, 153b) nicht stört; und Anschlagelemente-Antriebsmittel (262a, 262b) die geeignet sind, um die beweglichen Anschlagelemente (261a, 261b) unabhängig voneinander zu betätigen, um sich von der Anschlagposition in die Ausrückposition und umgekehrt zu bewegen,

- die numerische Steuermittel in unabhängig, aber koordiniert Weise das Vorrücken des Förderbandes (71) in Vorschubrichtung (Y), die Verschiebung in Querrichtung (X) des ersten Werkzeughalterkopfes (150a), die Verschiebung in Querrichtung (X) des zweiten Werkzeughalterkopfes (150b), die selektive Verschiebung in der Anschlagposition oder der Ausrückposition des ersten beweglichen Anschlagelement (261a), die selektive Verschiebung in der Anschlagposition oder der Ausrückposition des zweiten beweglichen Anschlagelement (261b), in einer zeitlichen Beziehung mit der Bewegung des Bearbeitungssteiges (30) in Arbeitsrichtung (Z), steuern,

- das Computerprogramm in der Lage ist, die Zeichnung des Musters (F) eines sich wiederholenden dekorativen Motivs (M) zu verarbeiten, um der numerischen Steuerung ein Arbeitsprogramm zur Verfügung zu stellen, das für die Realisierung des sich wiederholenden dekorativen Motivs (M) auf einem Lederwerkstück (P) oder ähnlichem Blattmaterial, das in der kontinuierlichen automatischen Stanzmaschine (10) verarbeitet wird, erforderlich ist.

11. Verfahren nach Anspruch 9 oder 10, **dadurch gekennzeichnet daß** die Realisierung der Zeichnung erfolgt in einer rechteckigen Zeichenfläche (R), die in der grafischen Benutzeroberfläche definiert ist, wobei die rechteckige Zeichenfläche (R) eine horizontale Abmessung aufweist, die einem Abstand (I) in Querrichtung (X) zwischen zwei aufeinanderfolgenden Mustern (F) des sich wiederholenden dekorativen Motivs (M) entspricht, und eine vertikale Abmessung, die der Neigung (A) in Vorschubrichtung (Y) zwischen zwei aufeinanderfolgenden Mustern (F) des sich wiederholenden dekorativen Motivs (M)

entspricht, wobei die Zeichnung durch Zeichnen einer Vielzahl von Zeichen (S) in der rechteckigen Zeichenfläche erhalten wird, die den Punkten der Oberfläche des zu bearbeitenden Blattmaterials (P) entsprechen, wobei ein Werkzeug (153a, 153b) der kontinuierlichen automatischen Stanzmaschine (10) wirken muss.

12. Verfahren nach dem vorigen Anspruch, **dadurch gekennzeichnet daß** über die grafische Benutzeroberfläche sind die horizontalen und vertikalen Abmessungen der rechteckigen Zeichenfläche (R) definiert.

13. Verfahren nach Anspruch 9 oder den folgenden, **dadurch gekennzeichnet daß** die aus einer Vielzahl von Zeichen (S) bestehende Zeichnung erhalten wird, indem eine Datei in einem Grafikformat in das Computerprogramm importiert wird, wobei das Computerprogramm eine Umwandlung der Datei im Grafikformat in eine Vielzahl von Zeichen (S) der rechteckigen Zeichenfläche (R) durchführt.

Revendications

1. Poinçonneuse automatique continue (10) du type approprié pour effectuer des opérations de poinçonnage, découpage à l'emporte-pièce, découpe, gravure, gravure, perforation ou similaire sur les pièces de cuir (P) ou matériaux en feuilles similaires, comprenant

- au moins deux montants (12, 13),
- une traverse de traitement (30) montée sur lesdits au moins deux montants (12, 13) en mode coulissant,
- ladite traverse de traitement (30) étant munie au fond d'un ensemble d'outils (100),
- des moyens d'entraînement (40) de ladite traverse de traitement (30) pour provoquer son glissement par rapport auxdits montants (12, 13) de façon à ce qu'elle effectue un mouvement alternatif qui est un mouvement de travail dudit ensemble d'outils (100) dans une direction de travail (Z),
- un ensemble de support de pièce (200) positionné au-dessous dudit ensemble d'outils et comprenant un plan de butée (260),
- un ensemble convoyeur (70) comprenant une bande transporteuse (71) agencée pour passer en configuration déroulée au-dessus de ladite plan de butée (260)
- une section de traitement (80) de ladite poinçonneuse automatique continue (10) située entre ledit ensemble d'outils (100) et ledit plan de butée (260), avec une pièce en cuir (P) ou un matériau en feuille similaire à traiter étant ame-

née à ladite section de traitement (80) et reposant sur ladite bande transporteuse (71) dans une direction de transport (Y),

ladite poinçonneuse automatique continue (10) étant **caractérisée en ce que** ledit ensemble d'outils (100) comprend au moins une première (150a) et une deuxième (150b) têtes porte-outils chaque tête comprenant une barre porte-outil allongée (152a, 152b) qui est allongée dans une direction transversale (X) et munie d'une pluralité d'outils (153a, 153b) agencés pour dépasser de ladite barre porte-outil (152a, 152b), lesdites première (150a) et deuxième (150b) têtes porte-outils étant disposées consécutivement dans une direction d'avance (Y) avec la même orientation spatiale, chacune desdites première (150a) et deuxième (150b) têtes porte-outils étant prévue dans ledit ensemble d'outils (100) pour coulisser dans ladite direction transversale (X) et **en ce que** comprenant des moyen d'entraînement transversal (170) associé à chacune desdites première (150a) et deuxième (150b) têtes porte-outils qui sont adaptés pour entraîner le mouvement de coulissement dans ladite direction transversale (X) de chacune desdites têtes porte-outils (150a, 150b), indépendamment les unes des autres.

2. Poinçonneuse automatique continue (10) selon la revendication 1 **caractérisée en ce que** ledit ensemble d'outil (100) comprend un cadre de support (110) muni de moyens de connexion amovibles (111) adaptés pour permettre l'ancrage dudit ensemble d'outil (100) à ladite traverse de traitement (30), et en outre pourvu d'au moins un premier (112a) et un deuxième (112b) rails de guidage parallèles l'un à l'autre, chacune desdites au moins une première (150a) et une deuxième (150b) têtes porte-outils étant associée à un premier (112a) et un deuxième (112b) rail de guidage respectifs par l'intermédiaire d'un élément coulissant correspondant (151a, 151b).
3. Poinçonneuse automatique continue (10) selon la revendication 1, **caractérisée en ce que** chacune desdites au moins une première (150a) et une deuxième (150b) têtes porte-outils comprend un cadre allongé (154a, 154b) comprenant un côté de travail avec un siège d'accouplement pour ladite barre porte-outils (152a, 152b) et des logements (155a) pour un élément presse-feuilles (160a, 160b) comprenant une plaque de pressage de feuilles (161a) et un moyen de connexion élastique (165a) adaptés pour être insérés dans lesdits logements (155a) pour connecter ladite plaque de pressage de feuilles (161a) avec ledit cadre allongé (154a, 154b) de sorte qu'elle puisse glisser dans une direction perpendiculaire au plan de ladite plaque de pressage de feuilles (161a) et avec une action élastique de ma-

nière à maintenir la distance maximale entre ladite plaque de pressage de feuilles (161a) et ledit cadre allongé (154a, 154b).

4. Poinçonneuse automatique continue (10) selon la revendication 1, **caractérisée en ce que** ledit plan de butée (260) comprend au moins un premier élément de butée mobile (261a) et au moins un deuxième élément de butée mobile (261b) chacun desdits premier (261a) et deuxième (261b) éléments de butée mobiles étant mobile dans la direction de ladite direction d'avance (Y), indépendamment l'un de l'autre, entre une position de butée, dans laquelle ledit élément de butée mobile (261a, 261b) est placé pour intercepter des outils (153a, 153b) d'une tête porte-outil respective (150a, 150b), et une position de désengagement, dans laquelle ledit élément de butée mobile (261a, 261b) est positionné pour ne pas interférer avec la course desdits outils (153a, 153b); et des moyens d'entraînement d'élément de butée (262a, 262b) aptes à actionner, indépendamment l'un de l'autre, lesdits éléments de butée mobiles (261a, 261b) pour passer de ladite position de butée à ladite position de désengagement et vice versa.
5. Poinçonneuse automatique continue (10) selon la revendication précédente, **caractérisée en ce que** ledit plan de butée (260) comprend une partie de support fixe fournissant au moins un premier logement (264a) pour loger ledit premier élément de butée mobile (261a) et au moins un second logement (264b) pour loger ledit deuxième élément de butée mobile (261b), lesdits au moins un premier (264a) et un deuxième (264b) logements étant configurés et dimensionnés pour permettre le glissement de l'élément de butée mobile respectif (261a, 261b) dans ladite direction d'avance (Y) entre deux positions de fin de course correspondant à ladite position de butée et à ladite position de désengagement.
6. Poinçonneuse automatique continue (10) selon la revendication 4 ou 5, **caractérisée en ce que** ledit plan de butée 260 comprend une partie de butée fixe (263), la surface supérieure desdits élément de butée mobiles (261a, 261b) étant plane et coplanaire avec la surface supérieure de ladite partie de butée fixe (263).
7. Poinçonneuse automatique continue (10) selon la revendication 4, ou les suivantes **caractérisé en ce qu'il** comprend des moyens de commande numérique par ordinateur capables de commander, indépendamment mais de manière coordonnée, afin d'exécuter un programme de poinçonnage donné, le mouvement d'alimentation de ladite bande transporteuse (71) dans ladite direction d'alimentation (Y), le déplacement sélectif dans ladite position de

butée et dans ladite position de désengagement dudit premier élément de butée mobile (261a), le déplacement sélectif dans ladite position de butée et dans ladite position de désengagement dudit deuxième élément de butée mobile (262a), en relation temporelle avec le mouvement de ladite traverse de traitement (30) dans ladite direction de travail (Z).

8. Poinçonneuse automatique continue (10) selon la revendication 4, ou les suivantes, **caractérisée en ce que** ledit ensemble de support de pièce (200) est muni de moyens (230) pour régler la profondeur de travail.

9. Procédé de réalisation de motifs sur cuir (P) ou matériau similaire en feuilles ou en ruban au moyen d'une poinçonneuse automatique continue (10) du type apte à effectuer des opérations de poinçonnage, découpage à l'emporte-pièce, refendage, découpage, perforation ou similaire, comprenant:

- une traverse de traitement (30) munie au fond d'un ensemble d'outils (100) comprenant au moins une première (150a) et une deuxième (150b) têtes porte-outils reliée audit ensemble d'outils (100) pour coulisser dans une direction d'allongement (X) de ladite tête porte-outil (150a, 150b), et, indépendamment les uns des autres, des moyen d'entraînement transversal (170) associé à chacune desdites première (150a) et deuxième (150b) têtes porte-outils adaptés pour entraîner leur mouvement de coulissement dans ladite direction d'allongement (X), indépendamment les uns des autres,
- des éléments d'entraînement (40) de ladite traverse de traitement (30) prévus pour provoquer un mouvement alternatif qui est un mouvement de travail dudit ensemble d'outil (100) dans la direction d'un axe de travail (Z),
- un ensemble de support de pièce (200) monté au-dessous dudit ensemble d'outils (100) en correspondance avec ce dernier et comprenant un plan de butée (260),
- un ensemble convoyeur (70) comprenant une bande transporteuse (71) agencée pour passer en configuration déroulée au-dessus de ladite plan de butée (260),
- une section de traitement (80) de ladite poinçonneuse automatique continue (10) située entre ledit ensemble d'outils (100) et ledit plan de butée (260) dans une direction d'avance (Y), et des moyens d'alimentation pour déterminer l'avancement de ladite bande transporteuse, de manière à faire passer ledit cuir ou matériau similaire en feuilles ou en ruban (P) en cours de traitement à travers ladite section de traitement (80),
- des moyens de commande numérique par or-

dateur de ladite machine appropriés pour commander lesdits moyens d'entraînement (40), lesdits moyens d'alimentation de la bande transporteuse (71) et lesdits moyens d'entraînement transversal (170), en fonction de programmes de poinçonnage exécutables par ladite machine,

ledit procédé comprenant:

- la réalisation, par l'intermédiaire d'une interface utilisateur graphique d'un programme d'ordinateur, d'un dessin constitué d'une pluralité de signes (S) qui représente un exemplaire (F) d'un motif décoratif répétitif (M) qui devant être obtenu sur une pièce en feuille (P) à traiter,
- la conversion dudit dessin dans un programme de travail de ladite poinçonneuse automatique continue (10),
- l'exécution automatique dudit programme de travail par ledit moyen de commande numérique,

ledit procédé étant **caractérisé en ce que** ladite interface utilisateur graphique dudit programme informatique prévoit la possibilité de produire et de gérer un nombre de couches ou de feuilles de dessin égal au nombre desdites têtes porte-outils (150a, 150b), chaque couche ou feuille de dessin étant associée à l'une desdites têtes - têtes porte-outils (150a, 150b).

10. Procédé selon la revendication 9, **caractérisé en ce que:**

- ledit plan de butée (260) comprend: au moins une premier élément de butée mobile (261a) et au moins un deuxième élément de butée mobile (261a) chacun desdits premier (261a) et deuxième (261b) éléments de butée mobiles étant mobile dans la direction de ladite direction d'avance (Y), indépendamment l'un de l'autre, entre une position de butée, dans laquelle ledit élément de butée mobile (261a, 261b) est placé pour intercepter des outils (153a, 153b) d'une tête porte-outil respective (150a, 150b), et une position de désengagement, dans laquelle ledit élément de butée mobile (261a, 261b) est positionné pour ne pas interférer avec la course desdits outils (153a, 153b); d'une tête porte-outils respective (150a, 150b);
- et des moyens d'entraînement d'élément de butée (262a, 262b) aptes à actionner, indépendamment les uns des autres, lesdits éléments de butée mobiles (261a, 261b) pour passer de ladite position de butée à ladite position de désengagement et vice versa.
- ledit moyen de commande numérique com-

mande, indépendamment mais de manière coordonnée, le mouvement d'alimentation de ladite bande transporteuse (71) dans ladite direction d'alimentation (Y), le déplacement dans ladite direction transversale (X) de ladite première tête porte-outil (150a), le déplacement dans ladite direction transversale (X) de ladite deuxième tête porte-outil (150b), le déplacement sélectif dans ladite position de butée et dans ladite position de désengagement dudit premier élément de butée mobile (261a), le déplacement sélectif dans ladite position de butée et dans ladite position de désengagement dudit deuxième élément de butée mobile (261b), en relation temporelle avec le mouvement de ladite traverse de traitement (30) dans ladite direction de travail (Z),

- ledit programme informatique est capable de traiter ledit dessin dudit exemplaire (F) d'un motif décoratif répétitif (M) à réaliser pour fournir audit moyen de commande numérique un programme de travail qui est nécessaire à la réalisation dudit motif décoratif répétitif (M) sur une pièce en cuir (P) ou un matériau en feuille similaire traité dans ladite poinçonneuse automatique continue (10).

de dessin rectangulaire (R).

11. Procédé selon la revendication 9 ou 10, **caractérisé en ce que** la réalisation dudit dessin s'effectue dans une zone de dessin rectangulaire (R) définie dans ladite interface utilisateur graphique, ladite zone de dessin rectangulaire (R) ayant une dimension horizontale correspondant à une distance (l) dans la direction transversale (X) entre deux exemplaires consécutifs (F) dudit motif décoratif répétitif (M) et une dimension verticale égale au pas (A) dans la direction d'alimentation (Y) entre deux exemplaires consécutifs (F) dudit motif décoratif répétitif (M), ledit dessin étant obtenu en dessinant dans ladite zone de dessin rectangulaire une pluralité de signes (S) correspondant à des points de la surface de la matière en feuille (P) à traiter où un outil (153a, 153b) de ladite poinçonneuse automatique continue (10) doit agir.
12. Procédé selon la revendication précédente, **caractérisé en ce que** lesdites dimensions horizontale et verticale de ladite zone de dessin rectangulaire (R) sont définies à travers ladite interface utilisateur graphique.
13. Procédé selon la revendication 9 ou les suivantes, **caractérisé en ce que** ledit dessin constitué d'une pluralité de signes (S) est obtenu en important un fichier dans un format graphique dans ledit programme informatique, ledit programme informatique effectuant une conversion dudit fichier au format graphique en une pluralité de signes (S) de ladite zone

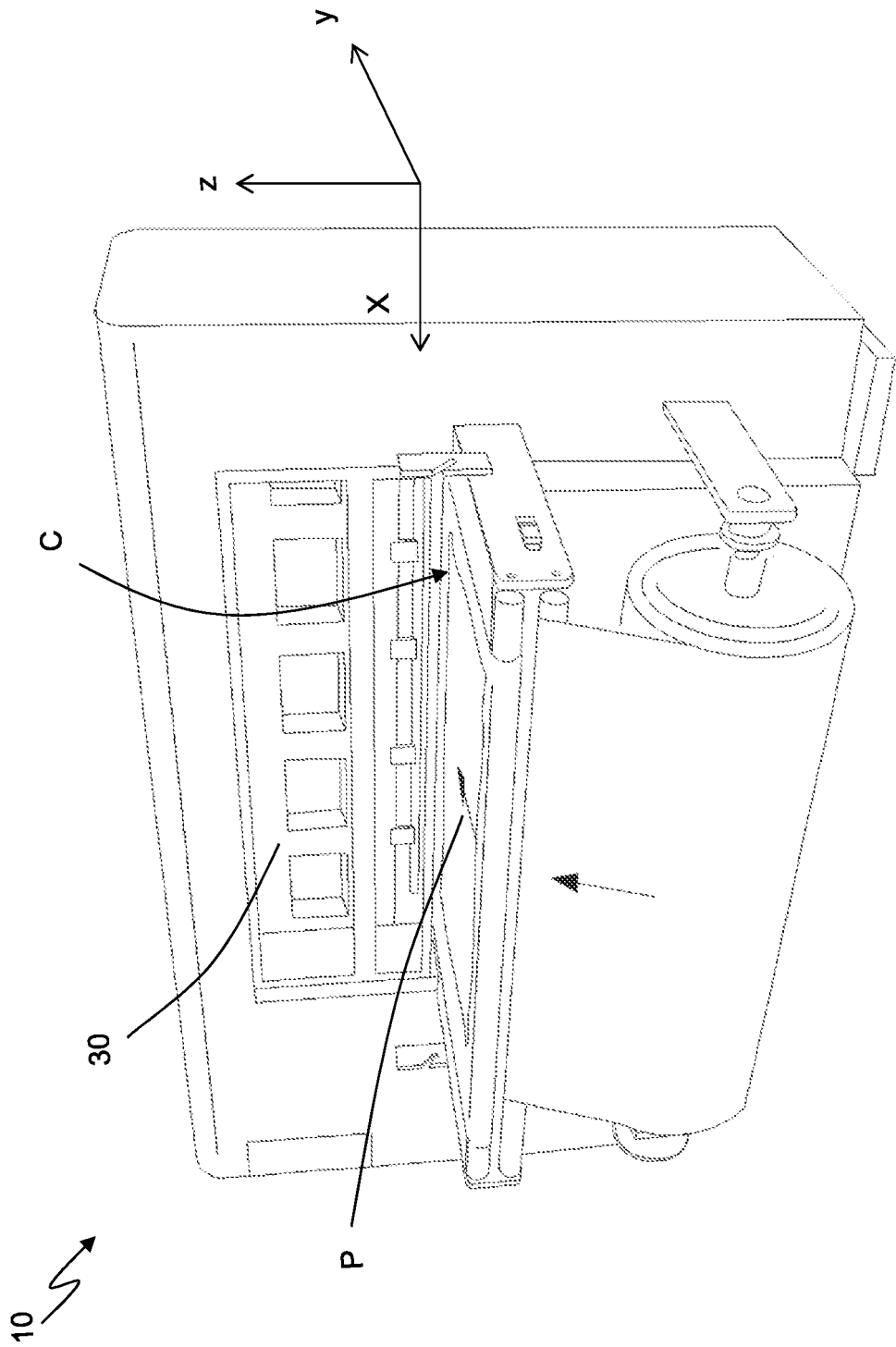


FIG. 1

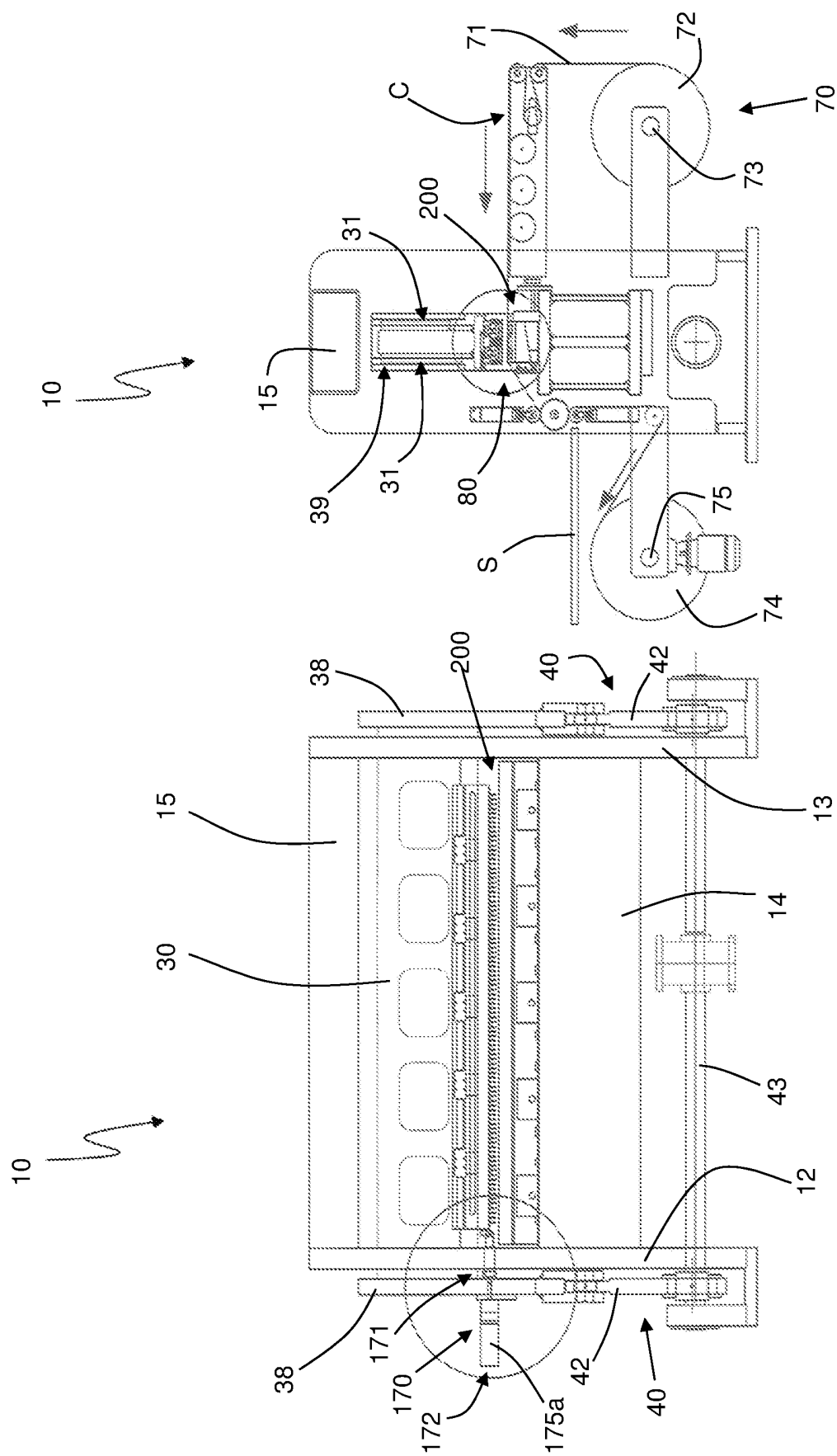


FIG. 2

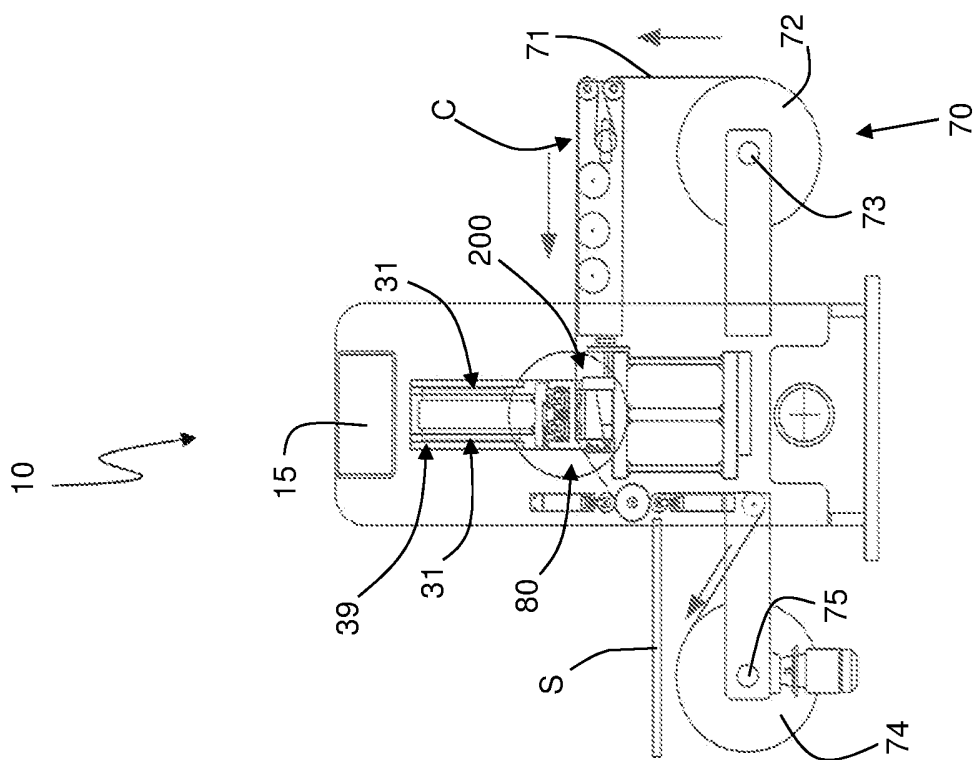
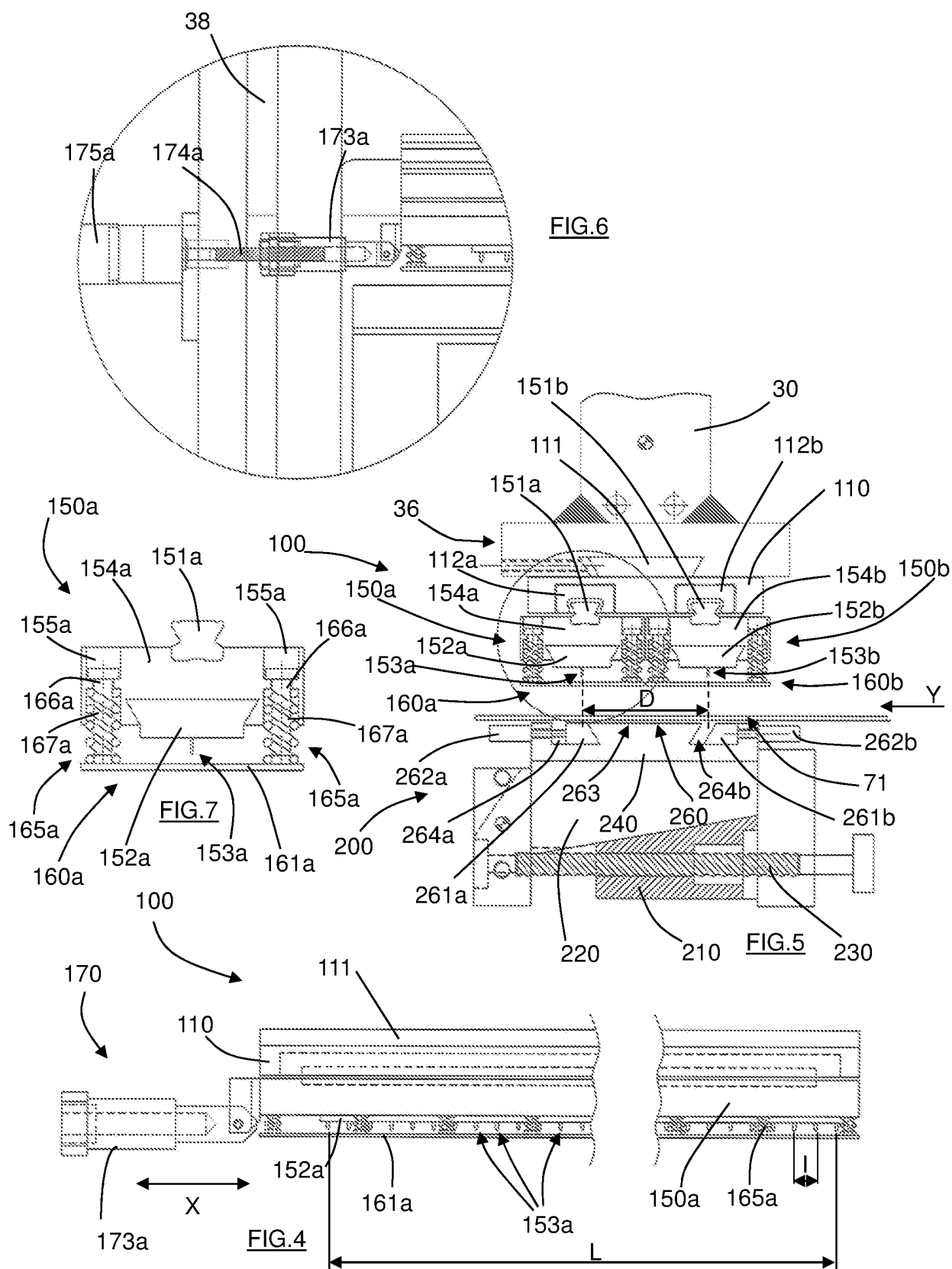
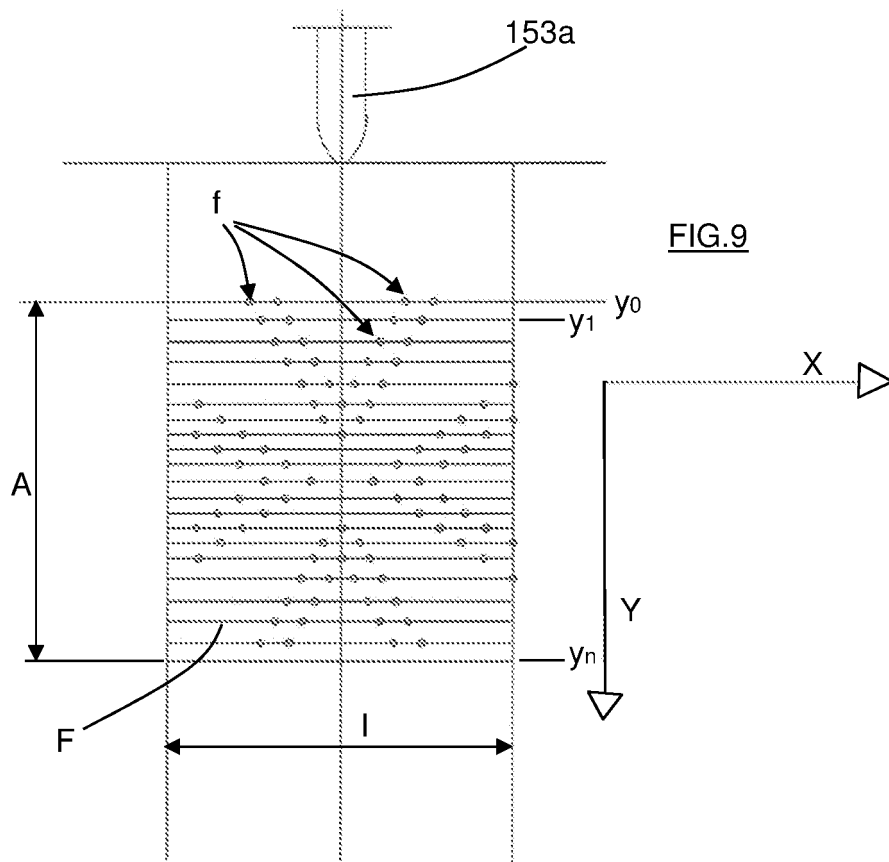
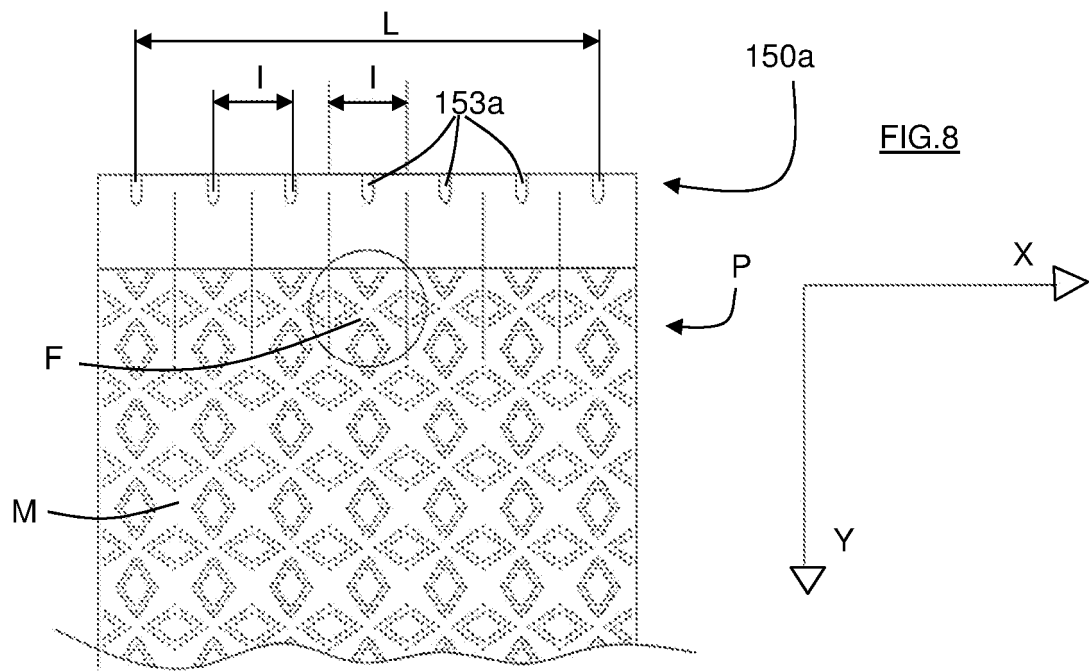


FIG. 3





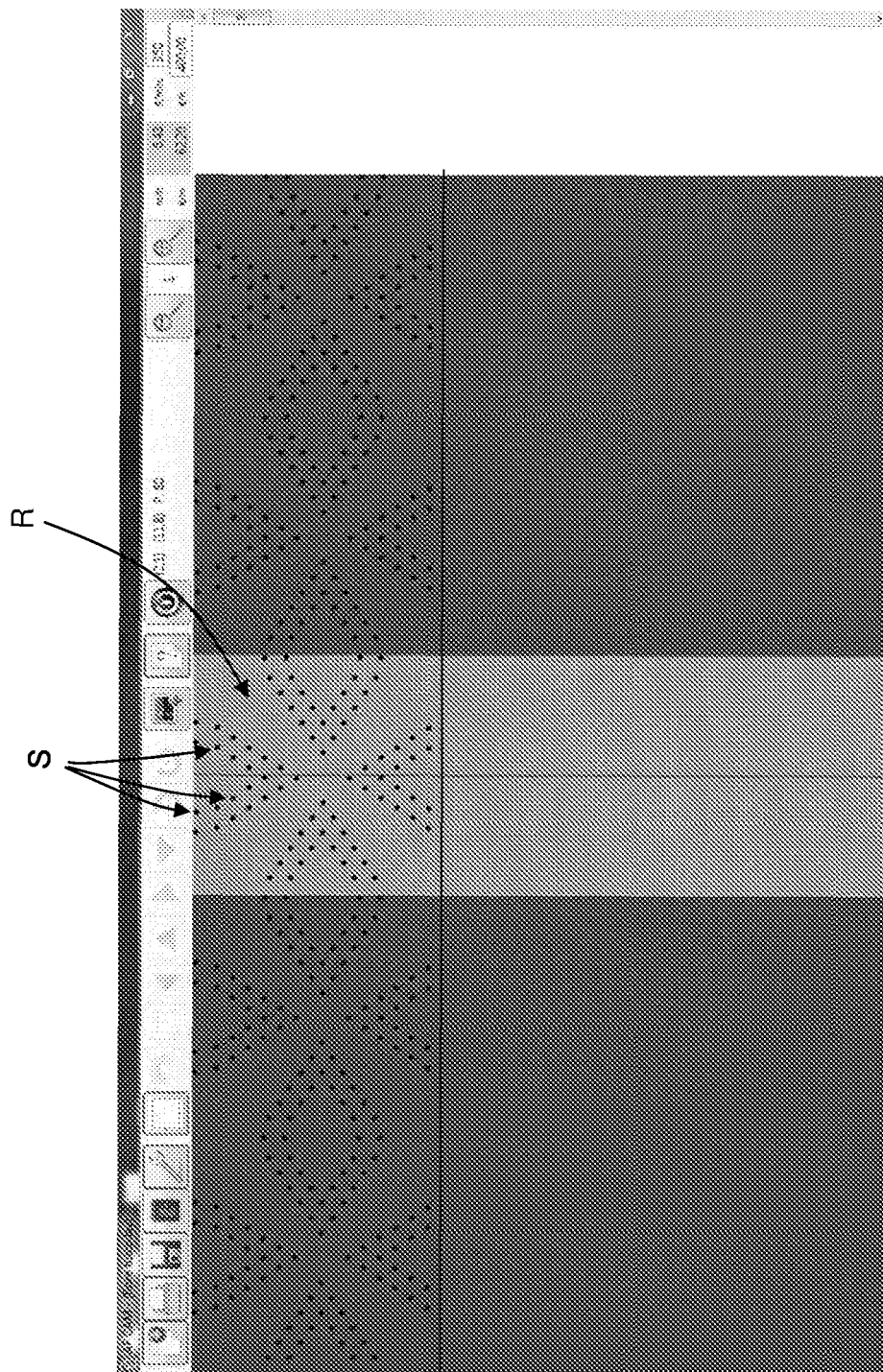
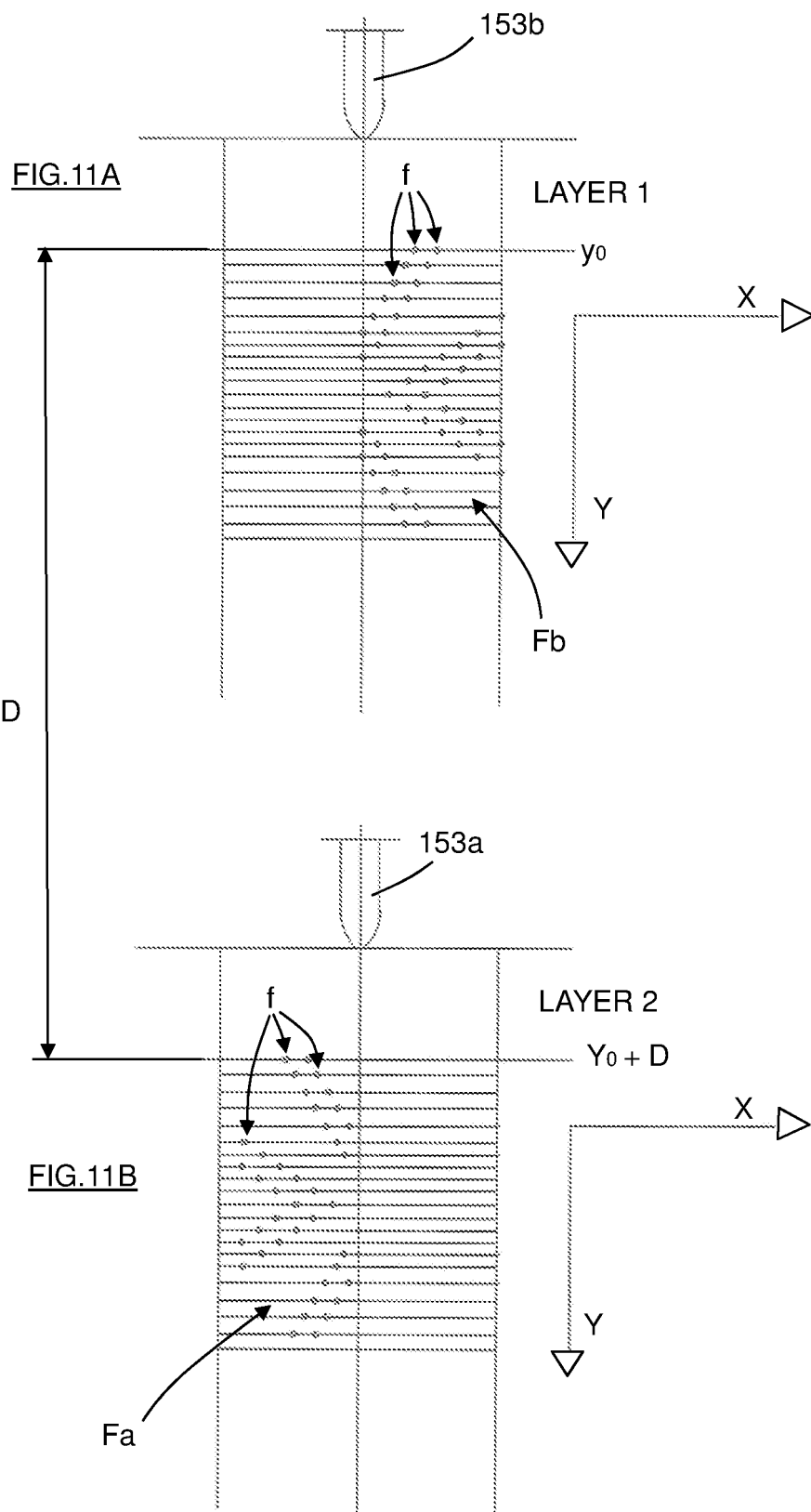


FIG.10



REFERENCES CITED IN THE DESCRIPTION

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