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(54) **MACHINE FOR STITCHING SHOE PARTS TO A RELATED SOLE**

MASCHINE ZUM ZUSAMMENNÄHEN VON SCHUHTEILEN UND SOHLE

MACHINE UTILISÉE POUR COUDRE DES PARTIES D'UNE CHAUSSURE À UNE SEMELLE

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(72) Inventor: **CENTANNI FIORINI, Massimo**
I-63900 Fermo (FM) (IT)

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(74) Representative: **Dall'Olio, Christian et al**
INVENTION S.r.l.
Via delle Armi, 1
40137 Bologna (IT)

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(73) Proprietor: **Ciucani Mocassino Machinery S.r.l.**
63900 Fermo (FM) (IT)

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Description

FIELD OF THE INVENTION

[0001] The present invention relates to the technical sector concerning the sewing of elements, for example an upper, to bottoms for realising shoes.

DESCRIPTION OF THE PRIOR ART

[0002] Machines are known for curved-needle sewing, in which the needle is borne at the free end of an arm, radially keyed on a shaft arranged longitudinally in the head of the machine.

[0003] The shaft is destined to be activated in alternated oscillating motion, such as to move the needle between two extreme positions along a curved trajectory that is concentric with the radius of curvature of the needle.

[0004] The machine is provided with suitable support and guide means, destined to define the correct positioning and trim of both the upper and the bottom during the sewing.

[0005] In the outward oscillation the needle first passes through the lower edge of the upper, and then the bottom, then to enter a rotating hook device, commonly known as a crochet, which is suitable for cooperating with the needle in order to form the sewing stitch.

[0006] In suitable phase relation with the outward oscillation of the needle, a positioning foot is activated to press the bottom in an opposite direction to the advancing of the needle, such as to bear the thrust thereof.

[0007] With the needle engaged in the upper and the bottom the longitudinal shaft is translated axially in synchrony with the crochet, by an amount that is equal to a predetermined sewing step, determining the advancement of the material to be sewn.

[0008] The return oscillation of the needle is then commanded, which determines the disengagement of the material and enables an opposite translation, by a same amount, of the shaft-needle-crochet group in order to return them into the initial position.

[0009] With a machine of the above-described type, duly equipped, shoes known as BALLERINAS are made; this machine, produced by the present applicant, is disclosed by document WO 2011/001360. Another machine of this kind is also disclosed by document GB 704548.

[0010] The BALLERINA shoe is constituted by an open upper, having small dimensions, joined to a slim bottom often lacking a heel and preferably made of leather; the bottom is prepared with a step in the relative perimeter edge and an incision that, starting from the upper surface of the bottom, penetrates obliquely into the thickness thereof, in the direction of the perimeter edge, and extends along a closed-loop pathway which follows the plan profile of the bottom at a practically constant distance.

[0011] In the language used by technical experts in the sector, this incision is known as a channel.

[0012] The upper is turned inside-out and the relative lower edge is glued at the step position.

[0013] The join is stabilised by a stitching which goes from the internal end of the incision up to the step, involving the lower pre-glued edge of the upper; once the sewing has been completed, the upper is newly turned and the stitching itself is invisible, both externally and internally of the shoe.

[0014] The sewing machine of the cited patent application is destined to realise the stitching, starting from a semi-finished workpiece, as described, by an open upper priorly turned and glued to the perimeter edge of a bottom provided, in the upper surface with an oblique incision.

[0015] The machine comprises: a vertical support column, solidly constrained to an oscillating arm, for resting the bottom; a spreader foot, made solid to the head of the machine, destined to partially insert in the incision, for distancing the adjacent flaps; an abutting foot, opposite the positioning foot, destined to laterally abut the semi-finished workpiece, for defining the horizontal position of the workpiece; a curved needle, made to oscillate between a retracted position and an advanced position; in the advanced position the needle inserts between the flaps in order to pass, in order, through the bottom and the upper in the mutually-glued zone.

[0016] The above-cited machine obviates the drawbacks of both manual sewing and the use of machines expressly constructed for these work operations, in particular:

in the first case the slowness of working and the need for specialised personnel;

in the second case the investment required for a machine lacking in versatility, which can risk being unused for longer or shorter periods of time according to market conditions.

[0017] One of the main advantageous aspects of the machine lies in the fact that the operating organs which constitute the setting-up of BALLERINA shoe stitching can be rapidly demounted and replaced with others, so that the machine can temporarily be converted for other operations.

[0018] The above-described machine, however, requires preparation of a semi-finished workpiece, obtained by pre-gluing the upper to the bottom, as it is with manual techniques or processes using other machines.

[0019] This preparatory step has to be manually performed by sufficiently qualified personnel and requires a certain amount of time, with consequent cost increases on the final product.

[0020] Further, the recent evolution of the footwear market obliges the manufacturing industries in the sector to be extremely flexible in relation to types of product, such as to be able to adapt rapidly to present fashions, even those of limited duration, and therefore with a not-particularly-high overall production number.

[0021] In order to attain the above result, very versatile apparatus is required, i.e. able to perform various operations with minimum adaptation, such as to contain the investments; sewing machines are without doubt among the primary apparatus in the footwear sector.

SUMMARY OF THE INVENTION

[0022] The aim of the present invention is therefore to provide a machine for sewing elements to a bottom for shoes, exploiting the intrinsic characteristics of curved-needle machines and is equipped such as to enable, with small adaptation, realisation of a wide variety of operations and shoes comprising, among those types, the one known as the BALLERINA.

[0023] A further aim of the invention consists in providing a machines which can perform the stitching starting from detached elements, without any need for preliminary gluing actions, though not excluding efficient operation with a pre-glued semi-finished workpiece.

[0024] A further aim of the invention is to provide a machines which is able to sew elements to a slim bottom made either of leather or a synthetic material, in which the incision (channel) can be provided in the upper surface or in the lower surface, in order to respectively obtain invisible seams, or seams that are in view.

[0025] A further aim of the invention relates to the desire to provide a machine in which the set-up characterising the machine can be rapidly demounted in order to convert the machine for other operations.

[0026] A further aims consists in provided, alternatively, a machine in which a straight needle is provided, while keeping the functional characteristics of the machine with a curved needle more or less intact.

[0027] The above aims are attained by a machine for sewing elements to a bottom for shoes, according to the subject-matter of independent claims 1, 2 and 3. The above-described machine enables obtaining the set aims thanks to the conformation and arrangement of the positioning foot, which determines, for the bottom, an orientation such that the relative perimeter edge, in the sewing zone, is on the entry side of the needle, as is the element to be joined thereto.

[0028] This configuration, exactly opposite to that of the machine of the precedingly-described patent application, enables intervening on the element when the element is constituted by an upper, in order to curl it in the tip and heel zones, similarly to what is achieved with other types of sewing, for joining an upper to a bottom.

[0029] Thanks to this, the preparatory step of pre-gluing of the upper to the bottom is no longer necessary, with the savings in terms of time and costs which derive therefrom; the possibility of operating effectively on a pre-glued semi-finished workpiece is obviously not precluded.

[0030] The above-mentioned advantageous configuration further makes the machine much more versatile; thus apart from the BALLERINA type of shoe, various

other models can be realised, as can joins to the bottoms of other elements that are not uppers.

[0031] The machine provided can work equally on leather or synthetic bottoms, with the abutment defined internally of the oblique incision (the channel), or profiled externally by the bottom itself.

[0032] In the case of the oblique incision, this can be provided in the upper surface or in the lower surface, in order to obtain, respectively, either invisible or visible stitch seams.

[0033] The set-up which makes the machine conform to the invention can be rapidly demounted, in some cases even only partially, in order to convert the machine for other operations.

[0034] The arrangement of the elements to be sewn enables realising, alternatively, a machine having a straight needle, which maintaining almost intact the functional characteristics of the machine with the curved needle.

BRIEF DESCRIPTION OF THE DRAWINGS

[0035] The characteristics of the invention will emerge from the following description of a preferred embodiment of the machine of the invention, in accordance with what is set out in the claims and with the aid of the accompanying tables of drawings, in which:

- figure 1 is a partial perspective view of the machine, in the stitching zone, with some parts in exploded view;
- figure 2 is a partial perspective view of a first bottom and an upper for obtaining a BALLERINA type shoe;
- figure 3 is a partial perspective view of the machine, from a viewing angle similar to that of figure 1, during the sewing of the bottom and the upper of figure 2;
- figure 4 is a view in larger scale of a detail of the sewing step of figure 3, from a different viewing angle;
- figure 5 schematically illustrates a second of the machine of figures 3 and 4, obtained on the vertical lie plane of the needle, during the sewing operation;
- figure 6 is a partial section of the first bottom sewn to the upper of figure 2, and a subsequent manual step of turning the upper inside-out;
- figure 7 is a partial perspective view of a second bottom and an upper for obtaining a shoe having an invisible stitching;
- figure 8 schematically illustrates a second of the machine alike to that of figure 5, during the sewing of the bottom to the upper of figure 7;

- figure 9 is a partial section of the second bottom sewn to the upper of figure 7, and a subsequently manual step of turning the upper inside-out;
- figure 10 is a partial perspective view of a third bottom and an upper for obtaining a shoe having a visible stitching;
- figure 11 schematically illustrates a section of the machine alike to that of figure 5, during the sewing of the bottom and the upper of figure 10;
- figure 12 is partial perspective view of a fourth bottom and a lateral welt to be joined to the edge of the bottom;
- figure 13 schematically illustrates a section of the machine alike to figure 5, during sewing of the bottom and the welt of figure 12.

DESCRIPTION OF PREFERRED EMBODIMENTS

[0036] With reference to the figures, M denotes the sewing machine of the invention, in its entirety, provided such as to join a bottom F for a shoe to at least an element E.

[0037] The machine M, which in itself is known, comprises a head in which the movement organs for activating the sewing organs are housed.

[0038] A longitudinal shaft enters between the movement organs which projects frontally from the head and bears a radial arm 1 (seen only partially in figure 1) keyed thereto, to the free end of which a needle 4 is fixed, developing in an arc of circumference, the centre of which coincides with the axis of the longitudinal axis.

[0039] The longitudinal shaft is destined to be activated in alternating oscillating motion, such as to move the needle 4 between two extreme positions, respectively a retracted position and an advanced position A, along a curved trajectory that is concentric to the radius of curvature of the needle 4 and arranged on a vertical plane.

[0040] During the outward run, between the retracted position R and the advanced position A, the needle 4 is destined to encounter and pass beyond the sewing material, supported and positioned by suitable organs, as will be described in detail herein below.

[0041] When the needle 4 is in the advanced position A, the point thereof is internal of a rotating hook device 5, known as a crochet, with which it cooperates for realising stitches having two knotted threads.

[0042] When the operator releases the start pedal of the machine M, a known device intervenes, which causes automatic halting, with the needle 4 in the retracted position R.

[0043] The longitudinal shaft is axially translatable with alternating machine in runs of predetermined size, in synchrony with the crochet 5 and in suitable phase relation with the oscillation of the needle 4, such as to impart

thereon a perpendicular motion to the relative oscillating plane, equal to a predetermined sewing step.

[0044] A known device, not illustrated, for protecting the needle can be associated to the needle 4, which device is constituted by an oscillating lever, concentric to the radial arm 1 and subjected to the action of a spring.

[0045] The lever contrasts any anomalous flexion stresses which might occur on the needle during the step where it passes through the material.

[0046] In an alternative embodiment (not illustrated) the machine M is provided with a straight needle, axially activated such as to define the respective retracted and advanced positions, and subjected to organs which can translate it perpendicularly to the axis in order to obtain the runs corresponding to the sewing step.

[0047] The machine M of the invention is equipped with a positioning foot 10, fixed to a bearing body 11 solidly constrained to the head of the machine M.

[0048] The positioning foot 10 is arranged by a flank of the crochet 5, by the lateral opening (not illustrated) provided therein to enable entry of the needle 4.

[0049] The positioning foot 10 exhibits a horizontally-developing slot 10A, destined to enable transit of the needle 4 as well as translation thereof in a step advancement.

[0050] By the side of the slot 10A, the positioning foot 10 fashions two protuberances 10B, almost parallel, extending on an opposite side to the crochet 5 (figure 1), the function of which will emerge more fully in the following.

[0051] To obtain a BALLERINA shoe, as described herein above, the bottom for the shoe F must be of a first type, distinguished with reference numeral F1, while element E to be joined to the bottom is an open upper T (figure 2).

[0052] Similarly to the prior art, the first bottom F1 is relatively slim (about 6 mm), preferably made of leather and lacking a heel.

[0053] The first bottom F1 comprises a step 21 in the relative perimeter edge 22 and an incision 23 (channel) which, starting from the upper surface 24 of the first bottom F1 penetrates obliquely into the thickness thereof, in the direction of the perimeter edge 22, and extends along a closed-loop pathway which follows, at a practically constant distance, the plan profile of the first bottom F1; the inside of the incision 23 defines an abutment B.

[0054] The upper T, before being sewn, is turned inside-out.

[0055] In order to realise the invisible sewing characterising the BALLERINA shoe, without the pre-gluing step necessary in the prior art, the machine M, apart from the positioning foot 10, is provided with:

- a curling group 30, comprising a curling foot 31 and a separating blade 32, destined to retain a larger extension in plan view of the upper T with respect to the perimeter of the first bottom F;
- a leather-guiding foot 40, destined to convey the edge of the upper T towards the sewing zone as well

as to constitute an upper abutment therefor (Fig. 3).

[0056] The curling foot 31, fixed to a relative arm 31B, is provided with a tip 31A and is arranged upstream of the needle 4, with respect to an advancement direction X of the material to be stitched (figures 1, 3).

[0057] The curling foot 31 is activated by organs of the machine in a claw movement, such that the tip 31A, as it presses on the edge of the upper T, causes an advancement thereof that is greater than the advancement caused by the sewing step imparted by the translation of the needle-crochet group.

[0058] The separating blade 32 which is fixed removably to the bearing body 11 is positioned at the curling foot 31, such as to be flat in front of the curling foot 31 at a suitable distance from the tip 31A (figures 1, 3, 4).

[0059] The separating blade 32 is destined to prevent contact between the bottom F1 and the upper T, such that the action of the curling foot 31 regards only the curling foot (figure 4) itself.

[0060] The leather-guiding foot 40, also removably fixed to the bearing body 11, extends between the zone of action of the curling foot 31 and the sewing foot when the needle 4 operates.

[0061] In a preferred constructional solution, the machine M comprises rest organs 13, destined to provide a lower abutment to the bottom F for shoes.

[0062] The rest organs 13, in the embodiment for BALLERINA type shoes, comprise an arm 14, with a plate 15 arranged on the top thereof (figure 1).

[0063] The plate 15 is associated to means for height-adjustment, not illustrated in the drawings.

[0064] To begin the stitching of the BALLERINA shoe, the first bottom F1 is arranged resting on the plate 15 and orientated such that the positioning foot 10 inserts, with the relative protuberances 10B, in the incision 23 in order to spread the adjacent flaps L1, L2 in the zone thereof which will be progressively involved in the stitching operation (figures 4, 5).

[0065] The splayed flaps L1, L2 define the abutment B which halts the entry of the protuberances 10B in the incision 23.

[0066] The positioning foot 10, engaged in the incision 23, is destined to support the first bottom F1 even in the absence of the plate 15.

[0067] The upper T, turned inside-out, is positioned such that the edge thereof destined to be sewn is:

- orientated upwards and abutting with the leather-guiding foot 40 (figures 3, 5);
- interposed between the separating blade 32 and the curling foot 31, in the action zone of the curling foot (figures 3, 4);
- flanked to the step 21 of the first bottom F1, in the sewing zone (Fig. 5).

[0068] For correct sewing, the first bottom F1 and the upper T exhibit, in a known way, respective reference notches (not illustrated).

[0069] The first two notches are reciprocally aligned at the start of the sewing operation, while others indicate the tracts in which the curling foot 31 has to be activated in order to increase the advancement of the upper T with respect to the bottom.

[0070] Once the sewing of the first bottom F1 to the upper T has been completed, the upper T is newly turned inside-out in order to return it to the normal configuration.

[0071] The stitching C is invisible from the outside of the shoe, as it is hidden by the folding of the upper T and is also invisible from the inside, as it is covered by the flaps L1, L2 of the slit 23, newly neared to one another (figure 6).

[0072] With a set-up as the one described above, with reference to the BALLERINA shoe, other shoe models can be obtained with an invisible stitching.

[0073] Figures from 7 to 9 illustrate a second bottom F2, in which the incision 23 is absent and a border 28 is provided at a constant distance from the perimeter edge 22, which border 28 stretches upwards.

[0074] A step 21 is defined between the border 28 and the perimeter edge 22, which step is alike to the step in the first bottom F, while the internal side of the border 28 defines the abutment B.

[0075] The second bottom F2 is positioned such that the border 28 is facing upwards.

[0076] The positioning foot 10 has a modified form, such that the protuberances 10B are longer and reach the abutment B conformed by the border 28, defining the correct position of the second bottom F2 (figure 8).

[0077] For this type of bottom F the presence of the rest organs 13 is required, which might be of a different shape to the ones described herein above.

[0078] In this case too, the upper T is sewn inside-out and, not being pre-glued, requires the use of a curling group 30.

[0079] When the stitching has been completed, the upper T is newly turned-out (figure 9).

[0080] The machine M, in the above configuration, can realise various shoe models, apart from the ones described, in which the lateral stitching between the bottom F and the upper T is in view.

[0081] Amongst the various possibilities, for example the "faux BALLERINA" shoe is indicated.

[0082] Figures 10 and 11 illustrate a third bottom F3 in which the incision 23 is realised in the respective external surface 26, i.e. the surface which when the shoe is finished will rest on the ground.

[0083] Similarly to what has already been written, the inside of the incision 23 defines the abutment B.

[0084] At the perimeter edge 22, in a possible but not exclusive embodiment, the third bottom F3 exhibits a step 21 similar to the ones already described with reference to the first and second bottom F1, F2.

[0085] The third bottom F3 is arranged with the exter-

nal surface 26 facing upwards, such that the positioning foot 10 can insert between the limbs L1, L2 of the incision 23 (figure 11).

[0086] For this type of bottom F, the presence of the rest organs 13 is optional.

[0087] The upper T is stitched straight, i.e. in the normal position which it will have when the shoe is finished and, not being pre-glued, required the use of the curling group 30.

[0088] The leather-guiding foot 40, in the presence of the step 21, superiorly abuts the third bottom F3, defining the correct height thereof (see figure 11 once more); in the absence of the step 21, it abuts both the bottom F3 and the edge of the upper T.

[0089] Externally of the upper T, in the zone where the stitching line joining it to the third bottom F3 is located, a decorative strip or a faux welt 50 can be applied (broken lines in figure 11), which is involved by the stitching.

[0090] Once the sewing has been completed, the incision 23 on the external surface 26 is sealed, for example by gluing the flaps L1, L2, and, if so required, a heel is applied (not illustrated).

[0091] The machine M can perform other operations, among which joining, with a visible stitching, a bottom F to an element E constituted by a welt 60.

[0092] Figures 12 and 13 illustrate a fourth bottom F4 in which the incision 23 is realised in the upper surface 24, while the perimeter edge 22 exhibits a straight cut.

[0093] The welt 60 exhibits, on the internal side, a lip 61 which superiorly delimits a niche 62 destined to contain the perimeter edge 22.

[0094] In order to perform this operation, the machine M has a simple set-up with respect to the configuration described herein up to this point, in which the leather-guiding foot 40 and the separating blade 32 are absent; further, the curling group 30 is maintained in an inoperative position, as it is not required.

[0095] The fourth bottom F4 is positioned such that the positioning foot 10 inserts in the slit 23, such as to distance the flaps L1, L2, similarly to what has already been described (figure 13).

[0096] In the fourth type of bottom F too, the presence of the rest organs 13 is optional.

[0097] The welt 60, thanks to the lip 61, is easily positioned on the perimeter edge 22 and once the first stitches have been sewn automatically follows the advancing of the fourth bottom F4 (see figure 13 once more).

[0098] An operational variant which is not illustrated relates to the above-described operation and consists in using a fifth bottom having the incision 23 realised in the external surface, i.e. the surface destined to rest on the ground, while the perimeter edge exhibits a straight cut alike to the cut of the above-mentioned fourth bottom F4.

[0099] The arrangement of the fifth bottom in the machine M, with the incision 23 facing upwards to enable the positioning foot 10 to insert therein, causes an up-turned orientation of the welt 60 with respect to what is illustrated in figures 12 and 13.

[0100] The sewing procedure is similar to what was set out with reference to the fourth bottom F4.

[0101] It is however understood that the above has the value of a non-limiting example, as any variations in detail, with respect to what is described, are considered from this point on to fall within the protective ambit of the following claims.

10 Claims

1. A machine for sewing elements to a bottom for shoes, the bottom (F) being provided with an abutment (B) located opposite a perimeter edge (22) of the bottom (F), which abutment (B) extends along a ringed trajectory that follows, at a substantially constant distance, a plan profile of the latter, in which said abutment (B) is defined internally of an incision (23) originating from a face (24, 26) of the bottom (F) itself, penetrating obliquely internally thereof in a direction of the perimeter edge (22); the machine (M) comprising: a positioning foot (10) provided with a slot (10A), which positioning foot (10) is fixed to a bearing body (11) solidly constrained to a head of the machine (M), which positioning foot (10) is able to abut against the abutment (B) in a zone of the abutment (B) from time to time affected in the sewing; a needle (4) mobile between a retracted position (R), in which it is external of at least one of said elements (E), the bottom (F) and the positioning foot (10), and an advanced position (A) in which the needle (4) is able to pass through the at least an element (E), then to penetrate laterally into the perimeter edge (22), then to exit at the abutment (B), then to transit through the slot (A) of the positioning foot (10) and then to enter a rotary-hook device (5), provided for cooperating with the needle (4) so as to realize stitches of the sewing (C);

characterised in that it comprises means for horizontally synchronically translating the needle (4) and the rotary-hook device (5) in an alternating motion in runs of an extension which is equal to a predetermined step; and **in that** the positioning foot (10) forms, at sides of the slot (10A), two substantially-parallel protuberances (10B) projecting from opposite sides of the rotary-hook device (5), which protuberances (10B) are designed to partially insert in the incision (23), so as to progressively distance adjacent flaps (L1, L2) in a zone of the incision (23) from time to time affected in the sewing and so as to support the bottom (F) in a predetermined orientation.

2. A machine for sewing elements to a bottom for shoes, the bottom (F) being provided with an abutment (B) located opposite a perimeter edge (22) of the bottom (F), which abutment (B) extends along a ringed trajectory that follows, at a substantially constant distance, a plan profile of the latter, in which in

said bottom (F) a border (28) is provided at a constant distance from the relative perimeter edge (22), which border (28) projects upwards, and an internal side of the border (28) defines the abutment (B); the machine (M) comprising: a positioning foot (10) provided with a slot (10A), which positioning foot (10) is fixed to a bearing body (11) solidly constrained to a head of the machine (M), which positioning foot (10) is able to abut against the abutment (B) in a zone of the abutment (B) from time to time affected in the sewing; a needle (4) mobile between a retracted position (R), in which it is external of at least one of said elements (E), the bottom (F) and the positioning foot (10), and an advanced position (A) in which the needle (4) is able to pass through the at least an element (E), then to penetrate laterally into the perimeter edge (22), then to exit at the abutment (B), then to transit through the slot (A) of the positioning foot (10) and then to enter a rotary-hook device (5), provided for cooperating with the needle (4) so as to realize stitches of the sewing (C);

characterised in that it comprises means for horizontally synchronically translating the needle (4) and the rotary-hook device (5) in an alternating motion in runs of an extension which is equal to a predetermined step; and **in that** the positioning foot (10) forms, at sides of the slot (10A), two protuberances (10B), projecting from opposite sides of the rotary hook device (5) and having lengths such as to abut the abutment (B) in order to define a correct positioning of the bottom (F).

3. A machine for sewing elements to a bottom for shoes, the bottom (F) being provided with an abutment (B) located opposite a perimeter edge (22) of the bottom (F), which abutment (B) extends along a ringed trajectory that follows, at a substantially constant distance, a plan profile of the latter, in which at least an element (E) is constituted by an open upper (T), and in which in a perimeter edge (22) of the shoe bottom (F) a step (21) is realised, destined to house the edge to be sewn of the at least an element (E); the machine (M) comprising: a positioning foot (10) provided with a slot (10A), which positioning foot (10) is fixed to a bearing body (11) solidly constrained to a head of the machine (M), which positioning foot (10) is able to abut against the abutment (B) in a zone of the abutment (B) from time to time affected in the sewing; a needle (4) mobile between a retracted position (R), in which it is external of at least one of said elements (E), the bottom (F) and the positioning foot (10), and an advanced position (A) in which the needle (4) is able to pass through the at least an element (E), then to penetrate laterally into the perimeter edge (22), then to exit at the abutment (B), then to transit through the slot (A) of the positioning foot (10) and then to enter a rotary-hook device (5), provided for cooperating with the needle (4)

so as to realize stitches of the sewing (C);

characterised in that it comprises means for horizontally synchronically translating the needle (4) and the rotary-hook device (5) in an alternating motion in runs of an extension which is equal to a predetermined step; and **in that** it comprises: a curling group (30), comprising a curling foot (31) and a separating blade (32), destined to retain a larger extension in plan view of the upper (T) with respect to the perimeter of the bottom (F); a leather-guiding foot (40), destined to convey the edge of the upper (T) towards the sewing zone as well as to constitute an upper abutment therefor.

4. The machine of claim 3, **characterised in that** the curling foot (31) is fixed to a relative arm (31B), is provided with a point (31A) and is arranged upstream of the needle (4) with respect to the advancement direction (X) of the material to be sewn, and **in that** the curling foot (31) is activated in a claw movement, such that the point (31A), pressing on the edge of the upper (T) causes a greater advancement thereon than that caused by advancing by one stitch step given by a translation of a needle-crochet group.
5. The machine of claim 3 or 4, **characterised in that** the separating blade (32) is removably fixed to the bearing body (11), is positioned at the curling foot (31) in such a way as to be flat in front thereof, at an appropriate distance from the relative point (31A), with the separating blade (32) able to prevent contact between the bottom (F) and the upper (T) of the tract in which the curling foot (31) acts.
6. The machine of claim 3, **characterised in that** the leather-guiding foot (40) is removably fixed to the bearing body (11) and extends between the zone of action of the curling foot (31) and the sewing zone in which the needle (4) operates.
7. The machine of any one of the preceding claims, **characterised in that** it comprises rest organs (13), associated to height-regulating means able to provide a lower abutment to the shoe bottom (F).
8. The machine of claim 7, **characterised in that** the rest organs (13) comprise an arm (14) at a top of which a plate (15) is arranged.

Patentansprüche

1. Maschine zum Annähen von Elementen an einen Schuhboden, wobei der Boden (F) eine Anschlagfläche (B) aufweist, die gegenüber einem umlaufenden Außenrand (22) des Bodens (F) angeordnet ist, und diese Anschlagfläche (B) sich entlang eines ringförmigen Pfades erstreckt, der in einem im We-

sentlichen konstanten Abstand einem Grundrissprofil des Bodens folgt, wobei die Anschlagfläche (B) innerhalb eines Einschnittes (23) ausgebildet ist, der ausgehend von einer Fläche (24, 26) des Bodens (F) und in Richtung des umlaufenden Außenrandes (22) schräg in den Boden eindringt; wobei die Maschine (M) Folgendes beinhaltet: einen Positionierungsfuß (10), der einen Schlitz (10A) aufweist, wobei der Positionierungsfuß (10) an einem tragenden Körper (11) befestigt ist, der an einem Kopf der Maschine (M) festgelegt ist, und der Positionierungsfuß (10) dafür ausgelegt ist, in dem jeweils vom Nähvorgang betroffenen Bereich der Anschlagfläche (B) gegen die Anschlagfläche (B) anzuschlagen; eine Nadel (4), die beweglich ist zwischen einer zurückgezogenen Stellung (R), in der sie sich außerhalb von zumindest einem der Elemente (E), dem Boden (F) und dem Positionierungsfuß (10), befindet, und einer vorgerückten Stellung (A), in der die Nadel (4) in der Lage ist, das zumindest eine Element (E) zu durchdringen, dann seitlich in den umlaufenden Außenrand (22) einzudringen, dann an der Anschlagfläche (B) auszutreten, dann durch den Schlitz (10A) des Positionierungsfußes (10) zu treten und dann in einen Umlaufgreifer (5) einzutreten, der dafür vorgesehen ist, in Zusammenarbeit mit der Nadel (4) die Nähstiche (C) zu bilden;

dadurch gekennzeichnet, dass sie Mittel zur horizontalen und synchronen Bewegung der Nadel (4) und des Umlaufgreifers (5) in einer Wechselbewegung und mit Laufwegen beinhaltet, deren Umfang gleich einer vorgegebenen Schrittgröße ist; und **dadurch, dass** der Positionierungsfuß (10) an den Seiten des Schlitzes (10A) zwei im Wesentlichen parallele Vorsprünge (10B) bildet, die von der dem Umlaufgreifer (5) abgewandten Seite hervorstehen, wobei diese Vorsprünge (10B) dafür ausgelegt sind, teilweise in den Einschnitt (23) eingeführt zu werden, um nach und nach in dem jeweils vom Nähvorgang betroffenen Bereich des Einschnittes (23) benachbarte Lagen (L1, L2) auseinander zu spreizen und um den Boden (F) in einer vorbestimmten Ausrichtung zu unterstützen.

2. Maschine zum Annähen von Elementen an einen Schuhboden, wobei der Boden (F) eine Anschlagfläche (B) aufweist, die gegenüber einem umlaufenden Außenrand (22) des Bodens (F) angeordnet ist, und diese Anschlagfläche (B) sich entlang eines ringförmigen Pfades erstreckt, der in einem im Wesentlichen konstanten Abstand einem Grundrissprofil des Bodens folgt, wobei der Boden (F) eine Kante (28) in einem konstanten Abstand von dem entsprechenden umlaufenden Außenrand (22) aufweist, und diese Kante (28) nach oben ragt, und eine Innenseite der Kante (28) die Anschlagfläche (B) bildet; wobei die Maschine (M) Folgendes beinhaltet: einen Positionierungsfuß (10), der einen Schlitz

(10A) aufweist, wobei der Positionierungsfuß (10) an einem tragenden Körper (11) befestigt ist, der an einem Kopf der Maschine (M) festgelegt ist, und der Positionierungsfuß (10) dafür ausgelegt ist, in dem jeweils vom Nähvorgang betroffenen Bereich der Anschlagfläche (B) gegen die Anschlagfläche (B) anzuschlagen; eine Nadel (4), die beweglich ist zwischen einer zurückgezogenen Stellung (R), in der sie sich außerhalb von zumindest einem der Elemente (E), dem Boden (F) und dem Positionierungsfuß (10), befindet, und einer vorgerückten Stellung (A), in der die Nadel (4) in der Lage ist, das zumindest eine Element (E) zu durchdringen, dann seitlich in den umlaufenden Außenrand (22) einzudringen, dann an der Anschlagfläche (B) auszutreten, dann durch den Schlitz (10A) des Positionierungsfußes (10) zu treten und dann in einen Umlaufgreifer (5) einzutreten, der dafür vorgesehen ist, in Zusammenarbeit mit der Nadel (4) die Nähstiche (C) zu bilden; **dadurch gekennzeichnet, dass** sie Mittel zur horizontalen und synchronen Bewegung der Nadel (4) und des Umlaufgreifers (5) in einer Wechselbewegung und mit Laufwegen beinhaltet, deren Umfang gleich einer vorgegebenen Schrittgröße ist; und **dadurch, dass** der Positionierungsfuß (10) an den Seiten des Schlitzes (10A) zwei Vorsprünge (10B) bildet, die von der dem Umlaufgreifer (5) abgewandten Seite hervorstehen und eine solche Länge aufweisen, dass sie gegen die Anschlagfläche (B) anschlagen, um die korrekte Positionierung des Bodens (F) zu bewirken.

3. Maschine zum Annähen von Elementen an einen Schuhboden, wobei der Boden (F) eine Anschlagfläche (B) aufweist, die gegenüber einem umlaufenden Außenrand (22) des Bodens (F) angeordnet ist, und diese Anschlagfläche (B) sich entlang eines ringförmigen Pfades erstreckt, der in einem im Wesentlichen konstanten Abstand einem Grundrissprofil des Bodens folgt, wobei zumindest ein Element (E) aus einem offenen Oberteil (T) besteht, und wobei in dem umlaufenden Außenrand (22) des Schuhbodens (F) eine Stufe (21) ausgebildet ist, die dafür bestimmt ist, den zu nähenden Rand von zumindest einem Element (E) aufzunehmen; wobei die Maschine (M) Folgendes beinhaltet: einen Positionierungsfuß (10), der einen Schlitz (10A) aufweist, wobei der Positionierungsfuß (10) an einem tragenden Körper (11) befestigt ist, der an einem Kopf der Maschine (M) festgelegt ist, und der Positionierungsfuß (10) dafür ausgelegt ist, in dem jeweils vom Nähvorgang betroffenen Bereich der Anschlagfläche (B) gegen die Anschlagfläche (B) anzuschlagen; eine Nadel (4), die beweglich ist zwischen einer zurückgezogenen Stellung (R), in der sie sich außerhalb von zumindest einem der Elemente (E), dem Boden (F) und dem Positionierungsfuß (10), befindet, und einer vorgerückten Stellung (A), in der die Nadel (4) in der

Lage ist, das zumindest eine Element (E) zu durchdringen, dann seitlich in den umlaufenden Außenrand (22) einzudringen, dann an der Anschlagfläche (B) auszutreten, dann durch den Schlitz (10A) des Positionierungsfußes (10) zu treten und dann in einen Umlaufgreifer (5) einzutreten, der dafür vorgesehen ist, in Zusammenarbeit mit der Nadel (4) die Nähstiche (C) zu bilden;

dadurch gekennzeichnet, dass sie Mittel zur horizontalen und synchronen Bewegung der Nadel (4) und des Umlaufgreifers (5) in einer Wechselbewegung und mit Laufwegen beinhaltet, deren Umfang gleich einer vorgegebenen Schrittgröße ist; und **dadurch, dass** sie Folgendes beinhaltet: eine Kräuselinheit (30), die einen Kräuselfuß (31) und ein Trennblatt (32) beinhaltet, und die dafür bestimmt ist, die größere Ausdehnung zusammenzuhalten, die das Oberteil (T) in der Ebene gegenüber dem Umfang des Bodens (F) aufweist; einen Leder-Führungsfuß (40), der dafür bestimmt ist, die Kante des Oberteils (T) dem Nähbereich zuzuführen sowie eine obere Anschlagfläche dafür zu bilden.

4. Maschine nach Anspruch 3, **dadurch gekennzeichnet, dass** der Kräuselfuß (31) an einem entsprechenden Arm (31B) befestigt ist, eine Spitze (31A) aufweist und in Vorschubrichtung (X) des Nähguts betrachtet stromaufwärts vor der Nadel (4) angeordnet ist, und dadurch, dass der Kräuselfuß (31) in eine Greifbewegung versetzt wird, so dass die Spitze (31A), indem sie auf die Kante des Oberteils (T) drückt, einen Vorschub desselben bewirkt, der größer ist als der durch das Vorrücken um einen Stichschritt bedingte Vorschub, der durch die Translationsbewegung der Nadel-Umgreifer-Einheit bewirkt wird.
5. Maschine nach Anspruch 3 oder 4, **dadurch gekennzeichnet, dass** das Trennblatt (32) abnehmbar an dem tragenden Körper (11) befestigt ist und derart an dem Kräuselfuß (31) angeordnet ist, dass es vor diesem flach und in einem angemessenen Abstand von der entsprechenden Spitze (31A) angeordnet ist, wobei das Trennblatt (32) dafür ausgelegt ist, die Berührung zwischen dem Boden (F) und dem Oberteil (T) in dem Abschnitt zu vermeiden, in dem der Kräuselfuß (31) wirkt.
6. Maschine nach Anspruch 3, **dadurch gekennzeichnet, dass** der Leder-Führungsfuß (40) abnehmbar an dem tragenden Körper (11) befestigt ist und sich zwischen dem Wirkbereich des Kräuselfußes (31) und dem Nähbereich, in dem die Nadel (4) wirkt, erstreckt.
7. Maschine nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** sie Auflageelemente (13) beinhaltet, die mit Höheneinstellungs-

mitteln verbunden sind, um eine untere Anschlagfläche für den Schuhboden (F) bereitzustellen.

8. Maschine nach Anspruch 7, **dadurch gekennzeichnet, dass** die Auflageelemente (13) einen Arm (14) beinhalten, an dessen Oberteil eine Platte (15) angeordnet ist.

10 Revendications

1. Une machine utilisée pour coudre des éléments à un dessous de chaussures, le dessous (F) étant doté d'une butée (B) située à l'opposé d'un bord périmétrique (22) du dessous (F), ladite butée (B) s'étend le long d'une trajectoire en anneau qui suit, à une distance essentiellement constante, un profil en plan de celui-ci, où ladite butée (B) est définie à l'intérieur d'une incision (23) partant depuis une face (24, 26) du dessous (F) lui-même, pénétrant obliquement à l'intérieur de celui-ci en direction du bord périmétrique (22) ; la machine (M) comprenant : un pied de positionnement (10) muni d'une fente (10A), ledit pied de positionnement (10) est fixé à un corps porteur (11) solidement assujéti à une tête de la machine (M), ledit pied de positionnement (10) est destiné à buter contre la butée (B) dans une zone de cette même butée (B) concernée à chaque fois par la couture ; une aiguille (4) mobile entre une position rentrée (R), dans laquelle elle est extérieure à au moins l'un desdits éléments (E), du dessous (F) et du pied de positionnement (10), et une position avancée (A) dans laquelle l'aiguille (4) est destinée à passer à travers ledit au moins un élément (E), puis à pénétrer latéralement dans le bord périmétrique (22), puis à sortir au niveau de la butée (B), puis à passer à travers la fente (10A) du pied de positionnement (10) et à entrer ensuite dans un dispositif à crochet rotatif (5), prévu pour coopérer avec l'aiguille (4) de manière à réaliser des points de couture (C) ; **caractérisée en ce qu'elle** comprend des moyens pour déplacer horizontalement de façon synchronisée l'aiguille (4) et le dispositif à crochet rotatif (5) avec un mouvement alternatif selon des courses dont l'extension est égale à un pas prédéfini ; et **en ce que** le pied de positionnement (10) forme, au niveau des côtés de la fente (10A), deux protubérances (10B) essentiellement parallèles saillant du côté opposé au dispositif à crochet rotatif (5), lesdites protubérances (10B) sont destinées à s'insérer partiellement dans l'incision (23), de manière à espacer progressivement des rabats adjacents (L1, L2) dans une zone de l'incision (23) concernée à chaque fois par la couture et de manière à supporter le dessous (F) dans une orientation prédéfinie.
2. Une machine utilisée pour coudre des éléments à un dessous de chaussures, le dessous (F) étant doté

d'une butée (B) située à l'opposé d'un bord périmétrique (22) du dessous (F), ladite butée (B) s'étend le long d'une trajectoire en anneau qui suit, à une distance essentiellement constante, un profil en plan de celui-ci, où une bordure (28) est prévue dans ledit dessous (F) à une distance constante du bord périmétrique (22) correspondant, ladite bordure (28) se projette vers le haut, et un côté intérieur de cette même bordure (28) définit la butée (B) ; la machine (M) comprenant : un pied de positionnement (10) muni d'une fente (10A), ledit pied de positionnement (10) est fixé à un corps porteur (11) solidement assujéti à une tête de la machine (M), ledit pied de positionnement (10) est destiné à buter contre la butée (B) dans une zone de cette même butée (B) concernée à chaque fois par la couture ; une aiguille (4) mobile entre une position rentrée (R), dans laquelle elle est extérieure à au moins l'un desdits éléments (E), du dessous (F) et du pied de positionnement (10), et une position avancée (A) dans laquelle l'aiguille (4) est destinée à passer à travers ledit au moins un élément (E), puis à pénétrer latéralement dans le bord périmétrique (22), puis à sortir au niveau de la butée (B), puis à passer à travers la fente (10A) du pied de positionnement (10) et à entrer ensuite dans un dispositif à crochet rotatif (5), prévu pour coopérer avec l'aiguille (4) de manière à réaliser des points de couture (C) ;

caractérisée en ce qu'elle comprend des moyens pour déplacer horizontalement de façon synchronisée l'aiguille (4) et le dispositif à crochet rotatif (5) avec un mouvement alternatif selon des courses dont l'extension est égale à un pas prédéfini ; et **en ce que** le pied de positionnement (10) forme, au niveau des côtés de la fente (10A), deux protubérances (10B), saillant du côté opposé au dispositif à crochet rotatif (5) et ayant des longueurs telles qu'elles butent contre la butée (B) de manière à définir un positionnement correct du dessous (F) .

3. Une machine utilisée pour coudre des éléments à un dessous de chaussures, le dessous (F) étant doté d'une butée (B) située à l'opposé d'un bord périmétrique (22) du dessous (F), ladite butée (B) s'étend le long d'une trajectoire en anneau qui suit, à une distance essentiellement constante, un profil en plan de celui-ci, où au moins un élément (E) est constitué d'une empeigne ouverte (T), et où dans le bord périmétrique (22) du dessous (F) de chaussure un degré (21) est réalisé, destiné à loger le bord à coudre dudit au moins un élément (E) ; la machine (M) comprenant : un pied de positionnement (10) muni d'une fente (10A), ledit pied de positionnement (10) est fixé à un corps porteur (11) solidement assujéti à une tête de la machine (M), ledit pied de positionnement (10) est destiné à buter contre la butée (B) dans une zone de cette même butée (B) concernée à chaque fois par la couture ; une aiguille (4) mobile

entre une position rentrée (R), dans laquelle elle est extérieure à au moins l'un desdits éléments (E), du dessous (F) et du pied de positionnement (10), et une position avancée (A) dans laquelle l'aiguille (4) est destinée à passer à travers ledit au moins un élément (E), puis à pénétrer latéralement dans le bord périmétrique (22), puis à sortir au niveau de la butée (B), puis à passer à travers la fente (10A) du pied de positionnement (10) et à entrer ensuite dans un dispositif à crochet rotatif (5), prévu pour coopérer avec l'aiguille (4) de manière à réaliser des points de couture (C) ;

caractérisée en ce qu'elle comprend des moyens pour déplacer horizontalement de façon synchronisée l'aiguille (4) et le dispositif à crochet rotatif (5) avec un mouvement alternatif selon des courses dont l'extension est égale à un pas prédéfini ; et **en ce qu'elle** comprend un groupe de plissage (30), comprenant un pied de plissage (31) et une lame de séparation (32), destiné à retenir une plus grande extension en plan de l'empeigne (T) par rapport au périmètre du dessous (F) ; un pied guide-cuir (40), destiné à amener le bord de l'empeigne (T) vers la zone de couture ainsi qu'à constituer une butée supérieure pour celui-ci.

4. La machine selon la revendication 3, **caractérisée en ce que** le pied de plissage (31) est fixé à un bras (31B) correspondant, est doté d'une pointe (31A) et est disposé en amont de l'aiguille (4) par rapport à la direction d'avance (X) du matériau à coudre, et **en ce que** le pied de plissage (31) est actionné selon un mouvement à griffe, de manière à ce que la pointe (31A), en appuyant sur le bord de l'empeigne (T), cause une avance de celle-ci supérieure à celle causée par l'avance d'un pas de couture donné par la translation d'un groupe aiguille-crochet.
5. La machine selon la revendication 3 ou 4, **caractérisée en ce que** la lame de séparation (32) est fixée de façon amovible au corps porteur (11), est positionnée au niveau du pied de plissage (31) de manière à être plate en face de celui-ci, à une distance appropriée de la pointe (31A) correspondante, la lame de séparation (32) étant destinée à empêcher tout contact entre le dessous (F) et l'empeigne (T) dans le tronçon où agit le pied de plissage (31).
6. La machine selon la revendication 3, **caractérisée en ce que** le pied guide-cuir (40) est fixé de façon amovible au corps porteur (11) et s'étend entre la zone d'action du pied de plissage (31) et la zone de couture où opère l'aiguille (4).
7. La machine selon l'une quelconque des revendications précédentes, **caractérisée en ce qu'elle** comprend des organes d'appui (13), associés à des moyens de réglage de la hauteur, destinés à fournir

une butée inférieure pour le dessous (F) de chaussure.

8. La machine selon la revendication 7, **caractérisée en ce que** les organes d'appui (13) comprennent un bras (14) sur le dessus duquel une plaque (15) est disposée.

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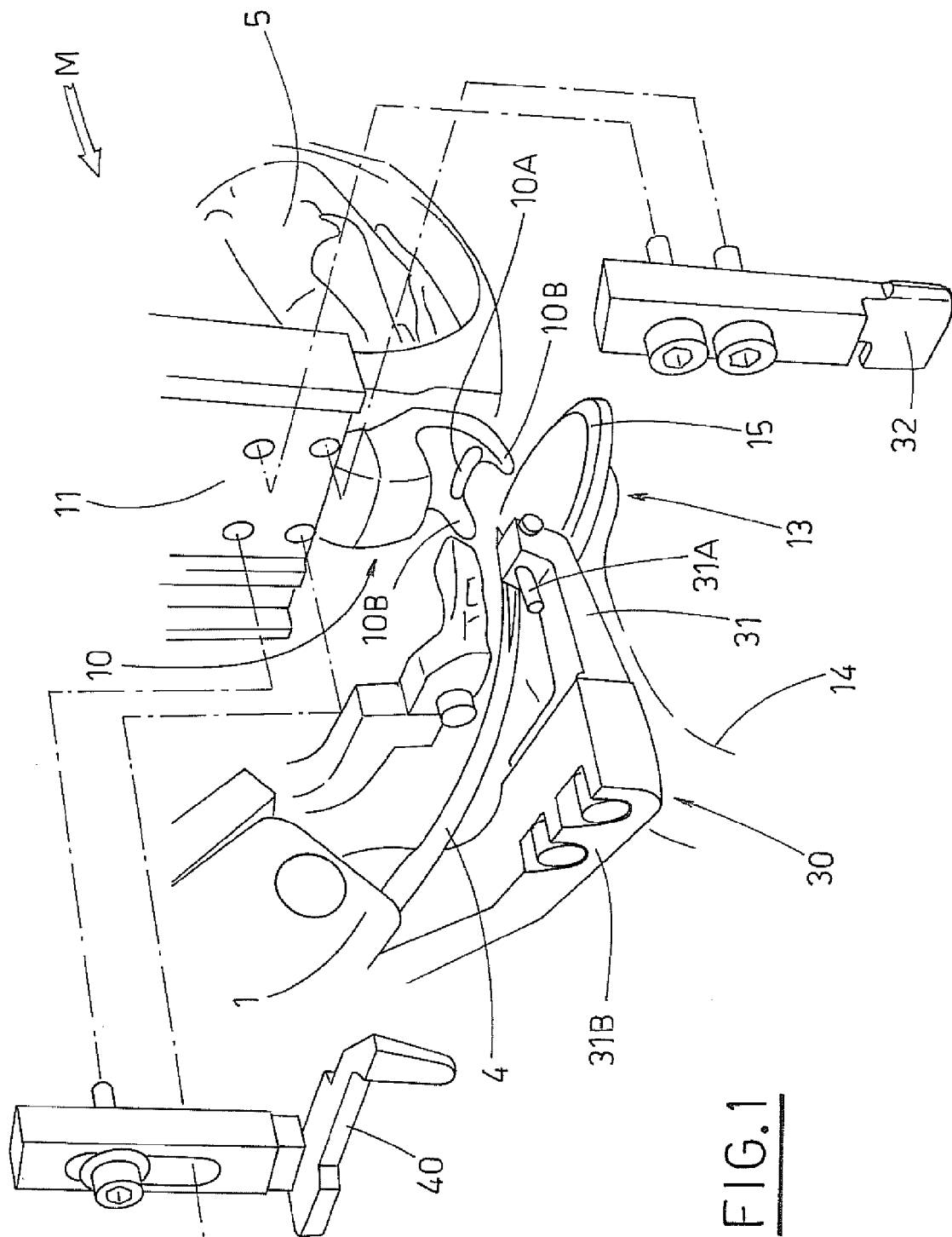


FIG. 1

FIG. 3

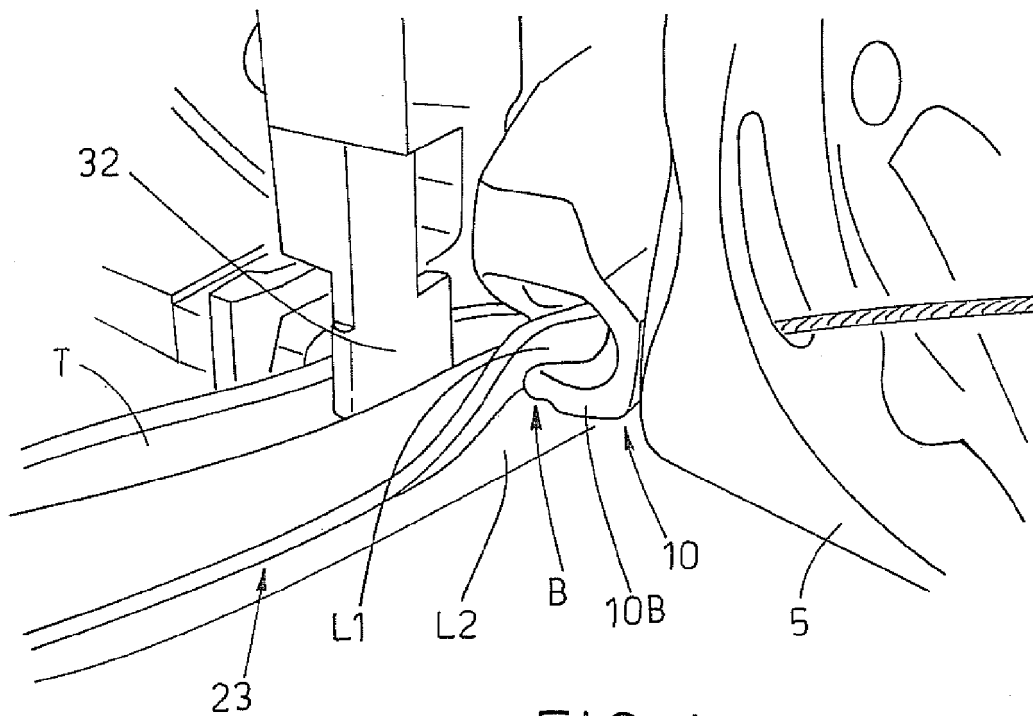
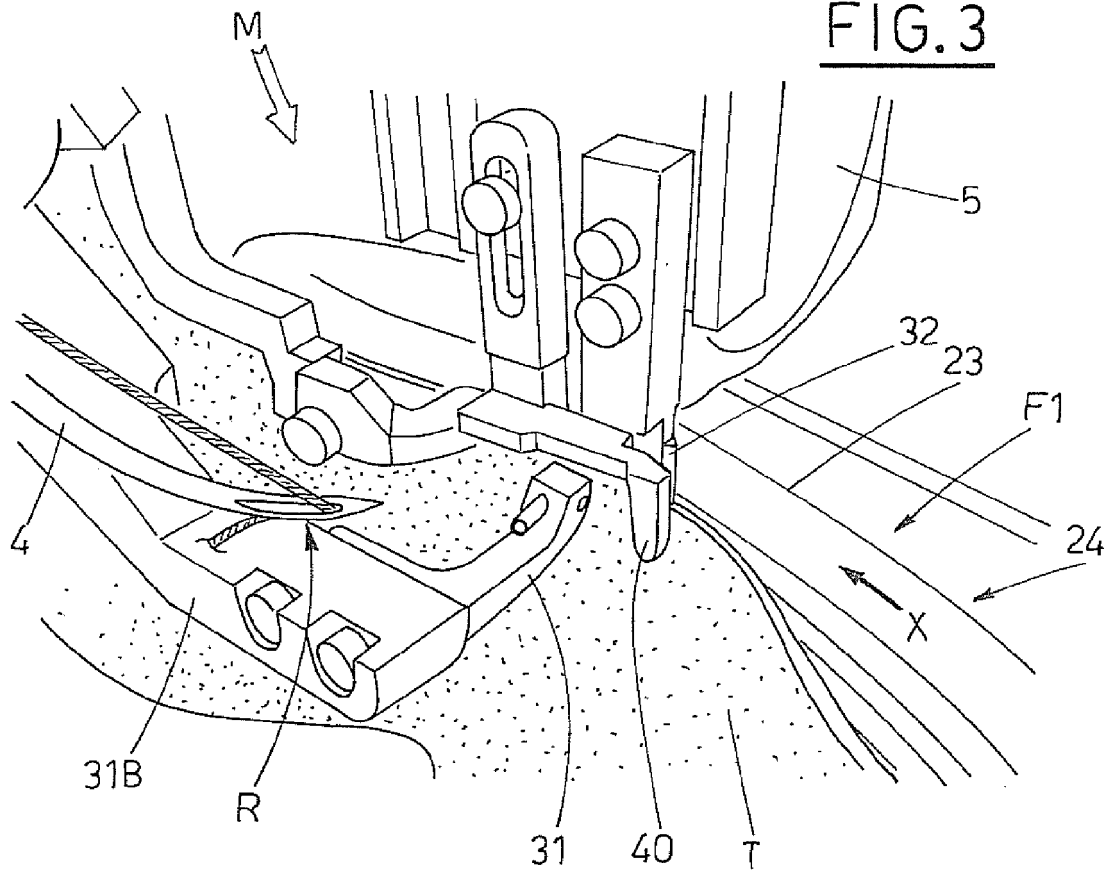


FIG. 4

FIG. 2

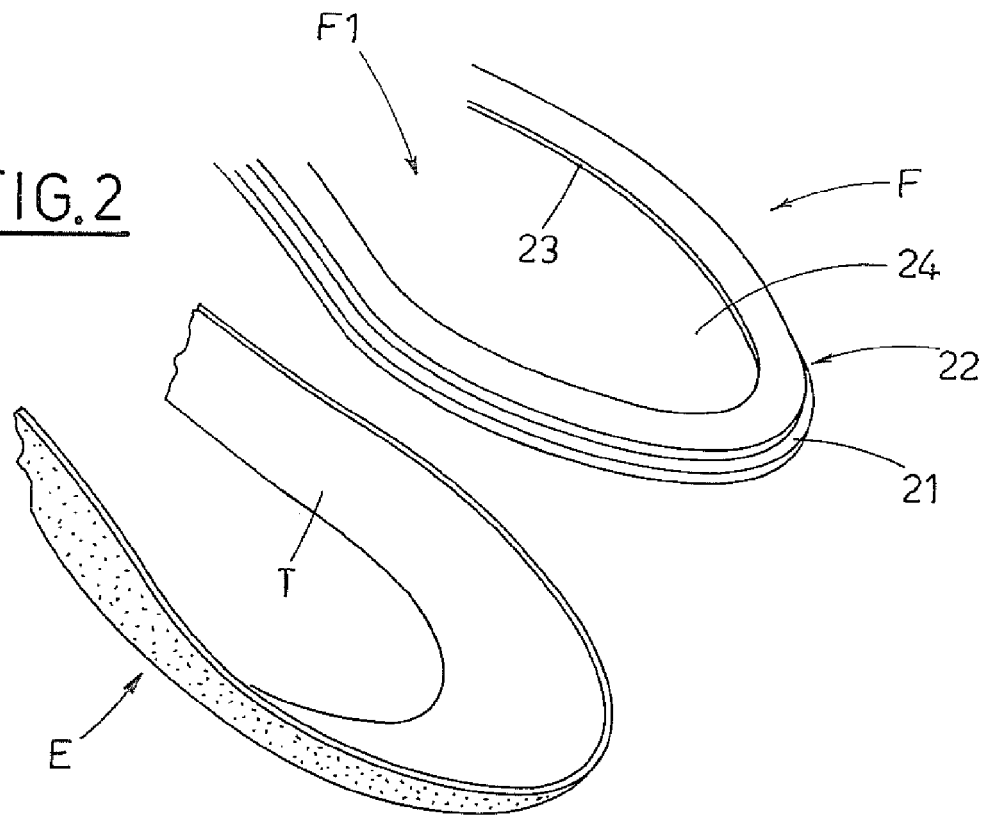


FIG. 5

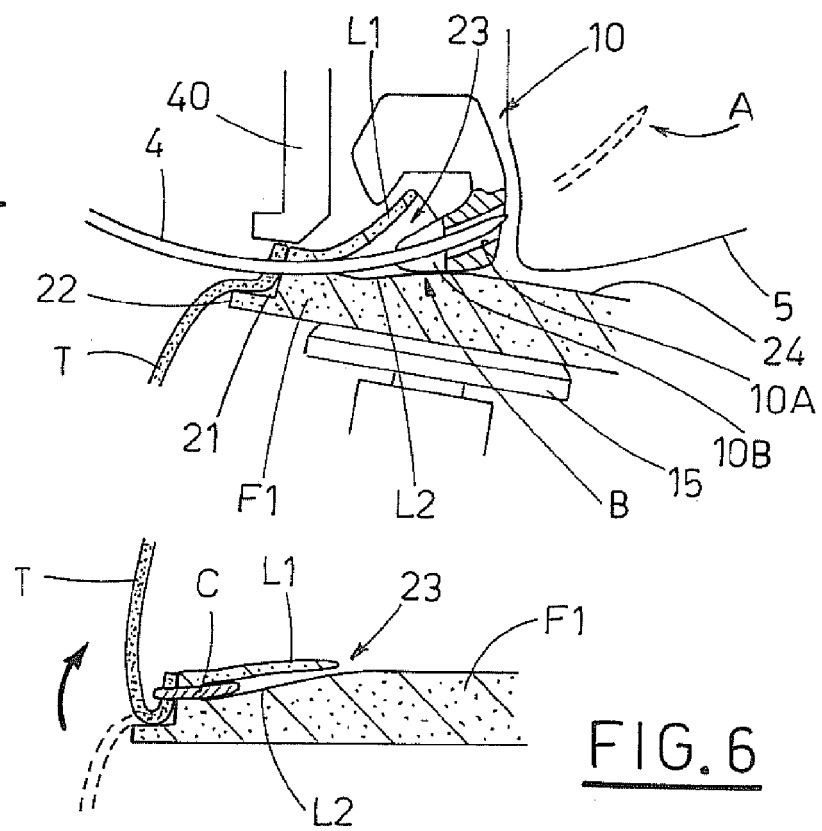


FIG. 6

FIG. 7

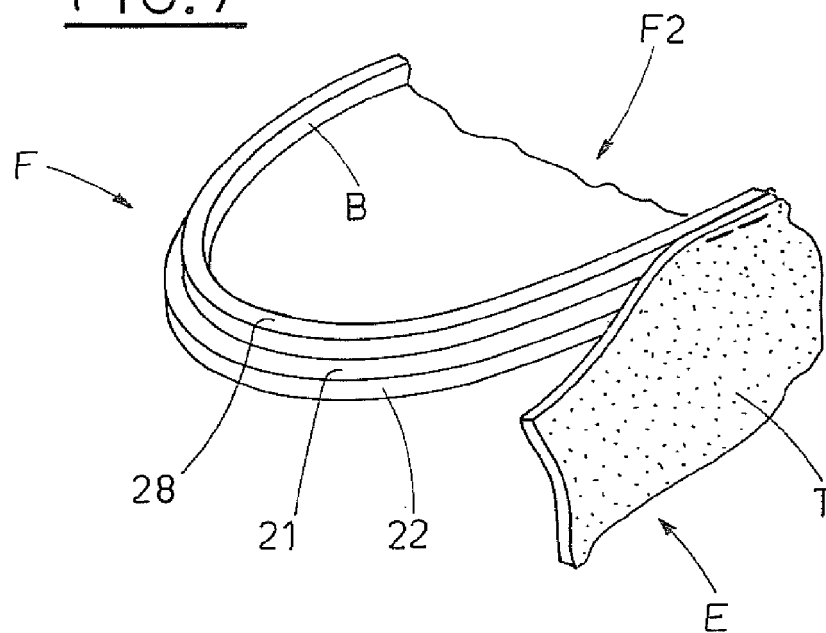


FIG. 8

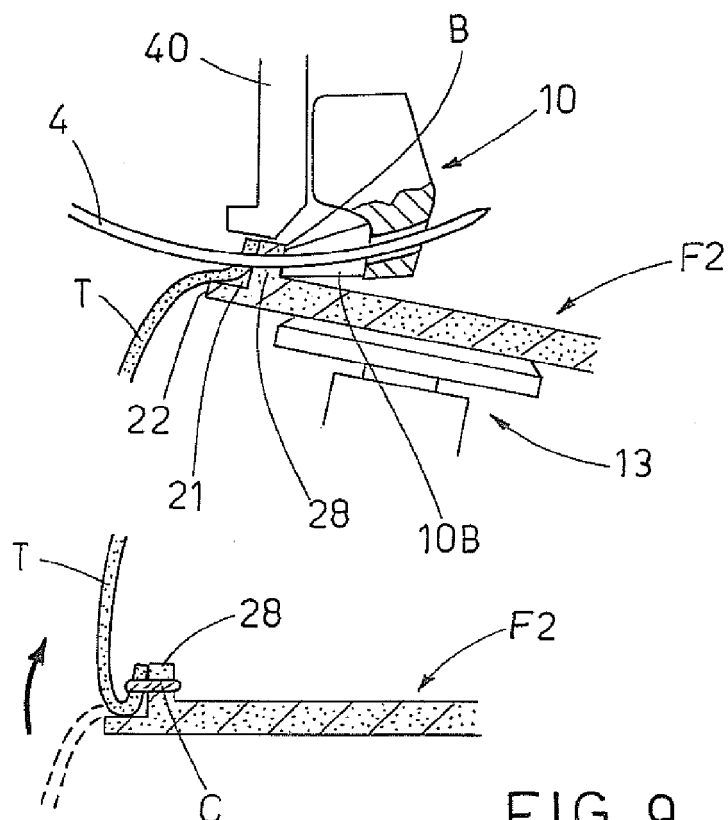


FIG. 9

FIG.10

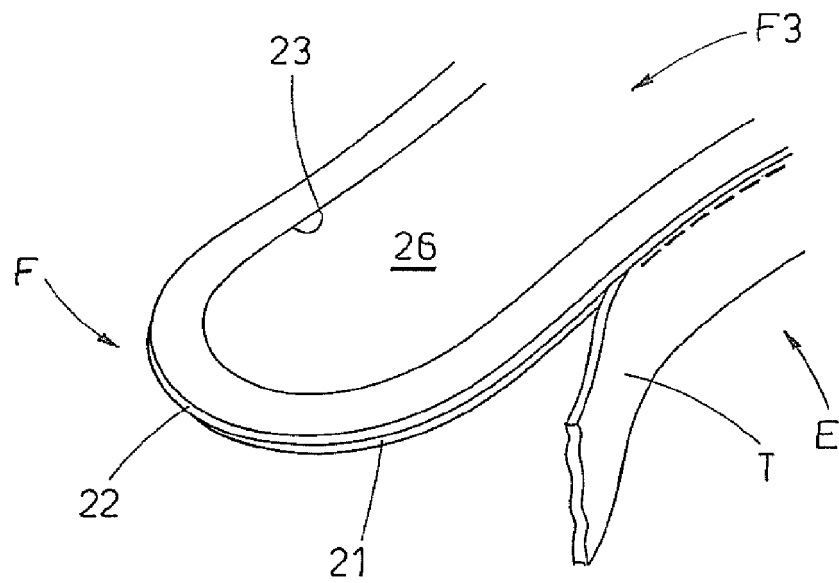


FIG.11

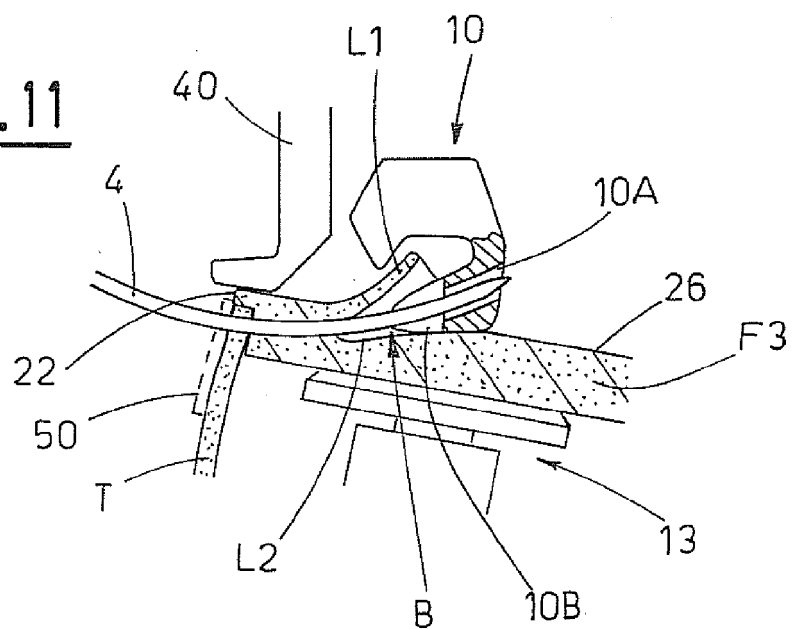


FIG. 12

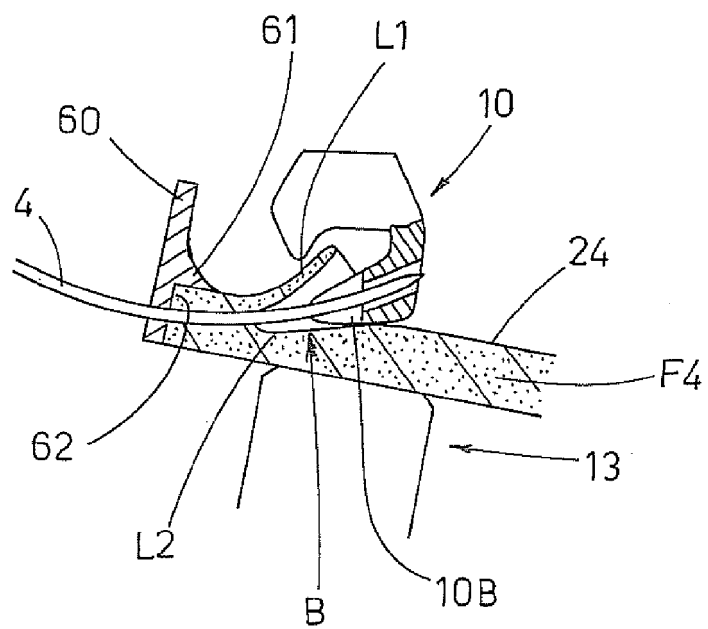
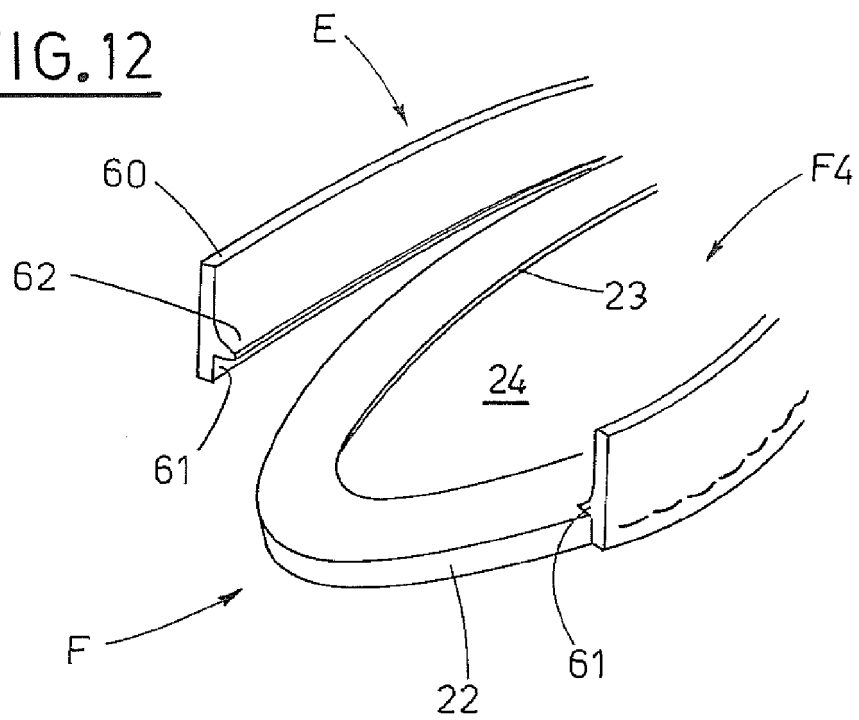


FIG. 13

REFERENCES CITED IN THE DESCRIPTION

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