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(54) **MACHINE FOR PRODUCING OPEN BOWS AND A PACKAGING ARTICLE COMPRISING SAID BOW**

(57) "A machine for producing open bows (100) comprising a fixed clamp (30) designed to clamp the ends of two ribbons (11, 12), each wound in a respective spool (1, 2). The machine for producing open bows (100) also comprises two respective gluing material dispensing devices (40)(45). The machine for producing open bows (100) also comprises a movable carriage (20) on which a respective movable clamp (21) is fixed, the combination of translation movements (F3) along a first longitudinal direction (X) of the movable carriage (20) and rotations (R) of the movable clamp (21) around a respective rota-

tion axis (AX3) integral with said movable carriage (20) is suited to create, on the ribbons (11, 12), joining lines ((GNT1), GNT2), (GNT3), (GNT4)) on which the gluing material is applied, when needed, by the dispensing device (40) so as to create the eyelets ((AS1), (AS2)) and the respective loops ((ANS1), (ANS2), (ANS3), (ANS4)) to obtain a complete bow (FCC). The loops ((ANS1), (ANS2), (ANS3), (ANS4)) are manufactured by compressing and gluing at least two joining lines ((GNT1), GNT2), (GNT3))."

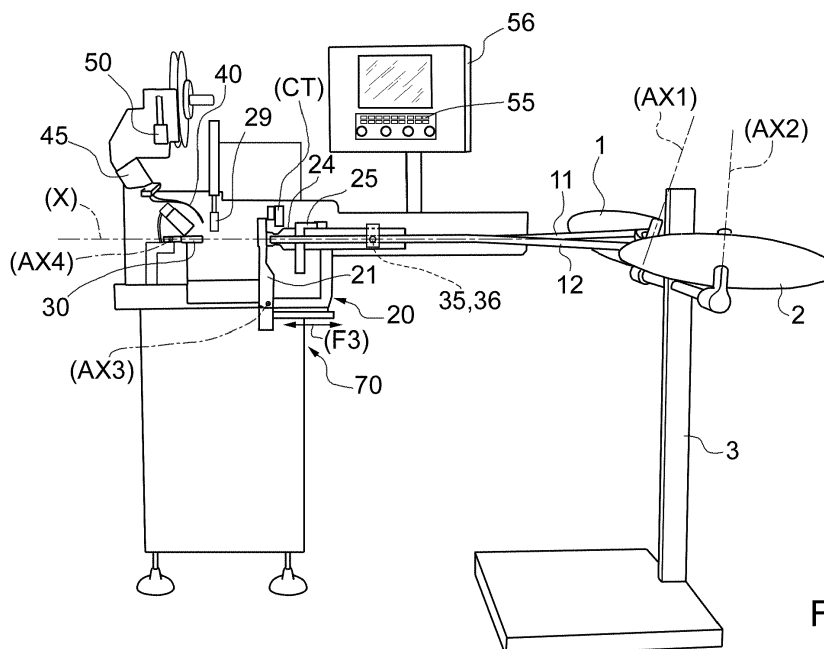


FIG.1

Description

[0001] The present invention relates to a machine for producing open bows for the manufacture of prefabricated bows starting from two ribbons wound on a spool.

[0002] As is known, prefabricated bows have been designed to be affixed to a gift package to simultaneously perform the function of keeping at least two flaps of the packaging paper together and decorating the package itself.

[0003] Automatic machines equipped with devices adapted to fold and glue (or weld) and cut ribbon flaps to produce bows are known in the manufacture of prefabricated bows.

[0004] Current machines, starting from 2 ribbons on spools with sizes ranging from 13 to 50 mm, and from 2 small ribbons with sizes ranging from 5 to 7 mm, form a closed, long, spread, already welded and cut to size bow.

[0005] As a result, the operator or shop assistant, to use it, must perform a number of opening operations:

- 1) take the two inner small ribbons on the tail side with the right hand;
- 2) apply a slight pressure next to the last weld near the tail with the thumb and the forefinger of the left hand;
- 3) pull the two small ribbons with the right hand while keeping the left hand still, until the bow opens up completely;
- 4) knot the small ribbons, while the bow is open, to lock said bow so it can be used to embellish the gift package.

[0006] In addition, if you are required to glue the bow to a surface without using the two small ribbons, you must proceed with the bow open and the two small ribbons knotted, applying a double-sided adhesive tape to the bow itself to make it ready for use.

[0007] Therefore, the main object of the present invention is to provide a machine for an easier production of open bows.

[0008] Therefore, according to the present invention, a machine for producing open bows is provided, as claimed in claim 1 or in any one of the claims directly or indirectly dependent on claim 1.

[0009] For a better understanding of the present invention, a preferred embodiment thereof will now be described, purely by way of a non-limiting example and with reference to the accompanying drawings, wherein:

- Figure 1 shows a schematic view of a machine for producing open bows according to the present invention;
- Figure 2 shows some enlarged details (in a first configuration) of the machine for producing open bows of Figure 1;
- Figure 3 shows the same details as Figure 2 in a second configuration;

- Figure 4 shows the same details as Figures 2, 3 in a third configuration;
- Figure 5 shows other details of the machine;
- Figure 6 shows the same details as Figure 5 as viewed from another standpoint;
- Figure 7 shows the same details as Figures 2-4 in a fourth configuration;
- Figure 8 shows the same details as Figures 2-4, 7 in a fifth configuration;
- Figure 9 shows the same details as Figures 2-4, 7, 8 in a sixth configuration;
- Figure 10 shows the same details as Figures 2-4, 7-9 in a seventh configuration;
- Figure 11 shows the same details as Figures 2-4, 7-10 in an eighth configuration;
- Figure 12 shows a portion of the machine for producing open bows of Figure 1, in which a device for transversely cutting the ribbons is pointed out in a first configuration;
- Figure 13 shows a portion of the machine for producing open bows of Figure 1, in which the device for transversely cutting the ribbons is pointed out in a second configuration;
- Figure 14 shows the tilting operation of a completed bow ready to be affixed with an adhesive element;
- Figure 15 illustrates the affixing operation of an adhesive element;
- Figure 16 shows the ensemble of a complete bow and an adhesive element; the ensemble is referred to as a "packaging article"; and
- Figure 17 shows an enlarged view of a bow manufactured with the machine for producing open bows of Figure 1.

[0010] In Figure 1, 100 indicates schematically, as a whole, a machine for producing open bows manufactured according to the teachings of the present invention.

[0011] As will be seen, the present machine for producing open bows 100 is used for the manufacture of bows from ribbons provided with adhesive elements, which allow the bows to be immediately and rapidly used (see below).

[0012] These features, as will be better seen later, make the use of these bows particularly advantageous during manual packaging in the shop, for example, of gift packages.

[0013] The machine for producing open bows 100 comprises two spools 1, 2, having identical widths, mounted on a pedestal 3. Preferably, but not necessarily, the axes (AX1), (AX2) of the spools 1, 2 are inclined towards one another so as to form an acute angle.

[0014] In actual use, the two ribbons 11 and 12 slide parallel to one another and are directed at first to a movable carriage 20 and then to a fixed clamp 30 and towards a device 40 for spraying hot glue.

[0015] The area in which the spraying device 40 and the fixed clamp 30 are located is overhung by a device for affixing adhesive elements 50.

[0016] The guides on which the movable carriage 20 runs, the fixed clamp 30, the device 40 for spraying hot glue, the device for affixing adhesive elements 50, as well as a control console 55 provided with a respective monitor 56 are advantageously mounted on the same fixed supporting structure 70.

[0017] For convenience of description, the machine for producing open bows 100 is characterised by a first longitudinal direction (X) (Figure 1) and a second transverse direction (Y), for example shown in Figure 2.

[0018] Referring now to Figures 1-15 we will now examine in greater detail the various components of the machine for producing the open bows 100 according to the invention and the operation thereof.

[0019] As shown in detail in Figure 2, the fixed clamp 30 comprises two jaws 31, 32 adapted to move along the second transverse direction (Y) in one of the two directions indicated by a double arrow (F1) so as to tighten the pair of ribbons 11, 12 pressed on top of one another to form a first joining line (GNT1).

[0020] Moreover, the clamp 30 rotates around an axis (AX4) from -90° to + 75° (Figure 1).

[0021] Actually, the pair of ribbons 11, 12 is fed to the fixed clamp 30 by a movable clamp 21 (also shown in Figure 1) mounted on said movable carriage 20. Also the movable clamp 21 comprises two jaws 22, 23 adapted to move along the second transverse direction (Y) in one of the two directions indicated by a double arrow (F2) so as to tighten - or not - the pair of ribbons 11, 12 pressed on top of one another (Figure 2).

Step 1

[0022]

1. at the START of the machine, the movable carriage 20 from the -RH- over-stroke goes towards the -LH- zero height, with an angular positioning of the movable clamp 21 of 5° -LH- (according to the program) rotating around an axis (AX3) (Figure 4); also the clamp 30 is at the "zero" height, which clamp is open and also rotated by an angle of 5° -LH- (according to the program) with respect to the axis (AX4);

- the clamps 30, 21 are close to each other (Figure 2);
- the (second (F1)) clamp 30 is closed and the ends of two ribbons 11 and 12 are locked;
- the (second (F2)) clamp 21 is opened and the clamp 21 with the movable carriage 20 is moved towards the first established height (according to the program) during the movement of the clamp 21 by means of the movable carriage 20 from left to right; at the height of 10mm, a closed clamp 34 comprising two jaws 27 and 28 is inserted from the bottom upwards inside the ribbons 11 and 12 and the clamp 21 is rotated

around the axis (AX3) by 25° -LH- (according to the program) (Figure 3);

- the first height is reached and the jaws 22 and 23 of the clamp 21 are closed, locking the ribbons 11 and 12 (Figure 4).

[0023] It should be noted that according to the program of the sliding height 20 and the tilt/rotation around the axis (AX3) of the clamp 21 to form a LH or RH angle, the fixed clamp 30 tilts/rotates around the axis (AX4) to the left or to the right so that the two ribbons 11 and 12 are always on the axis (X) in the centre of the clamp 21 before they are locked.

[0024] Figures 3 and 4 show that the movable clamp 21 is next to a paddle 24 having the shape of an open box. More precisely, as shown clearly in Figure 5, the paddle 24 has an elongated and box-like shape and includes a front recess 24A provided with a straight front opposing edge 24B.

[0025] Moreover, the paddle 24 is carried by the carriage 20 and thus follows all its movements along the first longitudinal direction (X).

[0026] At the rear of the machine for producing open bows 100, when the carriage 20 is retracted, a clamp 33 with two spreading arms 25, 26 opens up, which spreading arms 25, 26 act upon the portions of the ribbons 11, 12 behind the movable clamp 21, and which also comprises two tampers 35, 36 for locking the two ribbons 11 and 12, as has been shown, for example, in Figures 5, 6.

[0027] After the movable clamp 21 closes again when the jaws 22, 23 approach to each other in the direction of the arrow (F2), a second joining line (GNT2) forms (Figure 7).

Step 2

[0028]

- the jaws 25 and 26 of the clamp 33 are opened on the paddle 24, to form a loop of the two ribbons 11 and 12 (Figure 4);
- the two tampers 35 and 36 are closed on the paddle 24 to lock the two ribbons 11 and 12 (Figures 5, 6);
- the arms 25 and 26 of the clamp 33 are closed on the paddle 24, abandoning the loop of the two ribbons 11 and 12;
- the clamp 21 returns through the carriage 20 towards the zero height - from right to left (Figure 5);
- the carriage 20 stops at the height of 20 mm (according to the program);
- the clamp 21 returns to height 0° by rotating around the axis (AX3);
- the two spreading means 27 and 28 are opened (Figure 7) ;
- the inclination of the clamp 30 around the axis (AX4) returns to 0°.

[0029] In the space comprised between the two

spreading means 27, 28 of the clamp 34, the spraying device 40 injects a certain amount of hot glue on the second joining line (GNT2) inside the first eyelet (AS1) (Figure 5).

[0030] The set of the portions of the ribbons 11 and 12 between the two joining lines (GNT1) and (GNT2) define a first eyelet (AS1), as shown in Figure 5.

[0031] Meanwhile, a pushing finger 29 descends from above (arrow (F5)), which is inserted in the front recess 24A on the other side of the aforesaid second joining line (GNT2) and opposing the two spreading means 27, 28, which are located, as before mentioned, inside the first eyelet (AS1).

[0032] At this point, the entire carriage 20 of the movable clamps 21 translates from right to left (arrow (F3)) (in contact with the second joining line (GNT2) provided with a certain amount of hot glue). The second joining line (GNT2) is then pushed through the carriage 20 onto the first joining line (GNT1) from the movable clamp 21 to the fixed clamp 30, to ensure that at least a portion of the hot glue (which, as mentioned earlier, was sprayed only on the second joining line (GNT2)) is also distributed on the first joining line (GNT1) thanks to contact and compression between the two joining lines (GNT1), (GNT2).

[0033] At this point, the clamp 34 moves downwards and the jaws 27 and 28 close.

[0034] In this way, the first eyelet (AS1) has been compressed, forming two loops (ANS1), (ANS2) visible, for example, in Figure 8.

Step 3

[0035]

- the jaws 22 and 23 of the clamp 21 are opened;
- the vertical piston assembly 29 is moved towards the clamp 30 to lock the freshly glued ribbons 11 and 12 (Figure 8);
- the tampers 35 and 36 are opened on the paddle 24.

[0036] Meanwhile, the preparation of the cycle of the adhesive label 50 is started for closing the bow.

Step 4

[0037]

- the motor is actuated for the forward movement of the label;
- the label feed motor stops at the label stop signal of the photocell or after a time presettable according to the program;
- the suction of the label is operated;
- the cutting of the label is operated, which label is sucked by the label thrust piston;
- the label thrust piston is moved in the vertical axis with the clamp 30;

- the label is ready and waiting to be applied to the bow.

[0038] Figure 9 shows the step of forming a second eyelet (AS2), which is also visible in Figure 10.

[0039] To form the second eyelet (AS2), the carriage 20 goes back (Figure 9) (movement from left to right) while the pushing finger 29 keeps pressing the first eyelet (AS1) against the fixed clamp 30 to aid the gluing of the two joining lines (GNT1), (GNT2).

[0040] During the backward movement of the carriage 20, the movable clamp 21 is open and rotates in the anticlockwise direction (arrow (R)) around its axis (AX3), as has been shown in Figure 9, a certain angle followed in its movement by the paddle 24.

[0041] In addition, when the carriage 20 is moved back by 10mm (according to the program), the clamp 24 is inserted from the bottom upwards between the two ribbons 11 and 12, the jaws 27 and 28 being closed (Figure 9).

[0042] In the step shown in Figure 9, the two spreading arms 25, 26 are closed.

[0043] In this new step of forming the second eyelet (AS2) shown in Figure 10, the movable clamp 21 is closed again to produce a third joining line (GNT3), which, together with the second joining line (GNT2), defines the aforesaid second eyelet (AS2).

[0044] As also shown in Figure 10, as the movable clamp 21 closes, at the same time the pushing finger 29 moves from the left to the right and rises. This is to avoid detachment of the joining line GNT2 that forms the eyelet (AS1).

[0045] It should also be noted that on the basis of the set program, the second eyelet (AS2) is wider than the first eyelet (AS1) because the carriage 20 has moved towards the right by a greater length than that used for the formation of the first eyelet (AS1).

[0046] At this point, the various previous steps are repeated for the number of eyelets set by the program for several measures, settings and inclinations of the various axes (AX3), (AX4).

[0047] Obviously, the above-mentioned eyelet formation operations and the gluing thereof can be repeated for the desired number of eyelets.

[0048] As shown, also the second eyelet (AS2) has been compressed, forming other two loops (ANS3), (ANS4) visible, for example, in Figure 11.

[0049] The two loops (ANS3), (ANS4) are larger than the loops (ANS1), (ANS2) for aesthetic reasons.

[0050] At this point, the last cycle that gives shape to the finished bow begins, the clamp 21 being closed at the height of zero mm - near the clamp 30 (Figure 11).

Step 5

[0051] the clamp 34 is moved from the top downwards and the jaws 27 and 28 are closed;

- meanwhile, a pushing finger 29 descends from

above (arrow (F5)), which is inserted in the front recess 24A on the other side of the second joining line (Figure 11);

- the clamp 21 is opened;
- the pushing finger 29 is moved from the right to the left on the clamp 30 to lock the freshly glued ribbons;
- the tampers 35 and 36 are opened on the paddle 24;
- the clamp 21 is moved by means of the carriage 20 to the cutting height, the AX3 axis clamp assembly 21 is tilted/rotated to -15° (according to the program), the inclination of the clamp 30 being adjusted around the axis (AX4) so that the two ribbons 11 and 12 are in line with the axis (X) of the clamp 21;
- the clamp 21 is closed and the ribbons 11 and 12 are locked (Figure 12);
- the cutting cycle is started; it should be first noted that the cutting assembly (CT) is structurally bound to the clamp 21 and therefore rotates together with the clamp 21 itself;
- the cutting assembly (CT) is opened;
- the cutting assembly (CT) is moved along the axis between the two ribbons 11, 12 locked by the clamp 21 at the joining line (GNT4) (Figure 12);
- the cutting assembly (CT) is closed by cutting the two ribbons 11 and 12 (Figure 13).

[0052] The cutting of the ribbons 11, 12 is made easier by the fact that the two pieces 11A, 12A are tensioned by the joint action of the fixed clamp 30 with the finger 29 and the movable clamp 21.

[0053] The cutting of the ribbons 11, 12 leads to the formation of two pieces 11A, 12A which are integral with the remainder of a complete bow (FCC)(Figure 14).

[0054] The complete bow (FCC) is now only clamped by the fixed clamp 30.

[0055] The knife (CT) goes back to the zero position with the blades closed. Meanwhile, the glue gun 40 is moved outside the rotation axis area (AX4) of the clamp 30.

[0056] At this point, the fixed clamp 30 moves to the left and rotates by -90° in a counterclockwise direction, thus causing the bow (FCC) to be arranged so that the two pieces 11A, 12A are in the upper part of the bow (FCC) and in a substantially horizontal position (Figure 14).

[0057] The piston assembly of the pushing finger 29 moves from left to right and from top to bottom. Spraying the glue by means of a glue module 45 on the joint (GNT4) for gluing the label (Figure 12).

[0058] As shown in Figure 15, the device for affixing adhesive elements 50 extends its stem 50A downwards and places an adhesive element 80 on the two pieces 11A, 12A and on the back of the fourth joining line (GNT4).

[0059] After the assembly 50 goes back to the rest position, the clamp assembly 30 rotates and goes back to 0° (Figure 16). The jaws 31 and 32 open and a breath of air is enabled for a better discharge of the bow (FCC).

Then, the glue gun 45 returns to its position for a new cycle.

[0060] The ensemble of the bow (FCC) and the adhesive element 80 takes the name of "packaging article" (ATC), used, for instance, in shops for the packaging of gift packages (not shown) wherein the adhesive element 80 is used to attach together two or more flaps of the package, while the bow (FCC) performs the dual function of supporting said adhesive element 80 and truly embellishing the gift package.

[0061] The adhesive element 80 may be of the type shown in Figure 16, i.e. with a face already having the glue to speed up its gluing to the bow (FCC) and the opposite face provided with a covering layer (SCC) easily removable when, in use, the shop staff assigned to the packaging of gift packages must attach a packaging article (ATC) to the package.

[0062] In other words, the adhesive element 80 is an element (possibly obtained by cutting to size a continuous ribbon) having a first uncovered glue-less face and a second adhesive face (opposite to the first face) covered by said covering layer (SCC) that can be removed when necessary.

[0063] The hot gluing of the adhesive element on the bow is carried out by the glue module 45 which sprays the glue on the bow in the step illustrated in Figure 14, i.e. when the two pieces are in a substantially horizontal position.

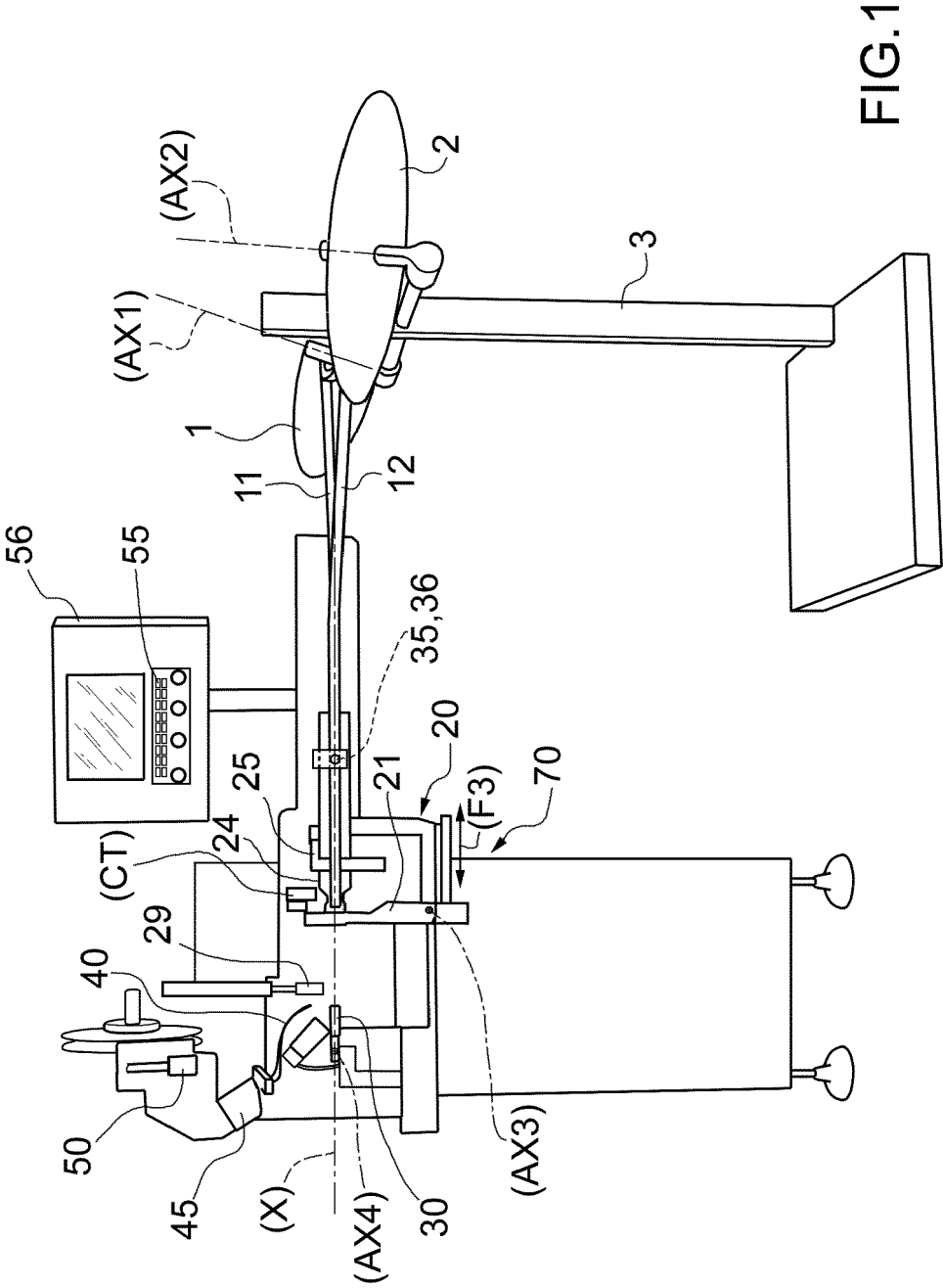
[0064] One of the advantages of the bow thus defined is a greater practicality of the application of the same bow in less time by a shop assistant for embellishing the package in its final form.

[0065] Moreover, one of the main advantages of the machine, which is the object of the invention, is that it produces the bow without going through several production steps, in an automatic and non-manual manner. Another advantage is that the part that first had to be done manually to obtain a similar bow has been automated.

Claims

1. A machine for producing open bows (100) comprising a fixed clamp (30) designed to clamp the ends of two ribbons (11, 12), each wound in a respective spool (1, 2); provided with two gluing material dispensing devices (40) and (45);
a machine for producing open bows (100) **characterized in that** it further comprises a movable carriage (20), on which there is fitted a respective movable clamp (21), a cutting assembly (CT) and a box-shaped paddle (24), which comprises the clamp (33) and the tampers (35) and (36), the combination of translation movements (F3) along a first longitudinal direction (X) of said movable carriage (20) and rotations (R) of said movable clamp (21) around a respective rotation axis (AX3) integral with said movable carriage (20) being suited to create, on said

- ribbons (11, 12), joining lines ((GNT1), GNT2), (GNT3), (GNT4)) on which said gluing material is applied by the dispensing device (40) so as to create at least one eyelet ((AS1), (AS2)) and at least two respective loops ((ANS1), (ANS2), (ANS3), (ANS4)) to obtain a complete bow (FCC); said at least two respective loops ((ANS1), (ANS2), (ANS3), (ANS4)) being manufactured by compressing and gluing at least two joining lines ((GNT1), GNT2), (GNT3)).
2. Machine for producing open bows (100), according to claim 1, **characterized in that** said fixed clamp (30) comprises two jaws (31, 32), which are suited to move along a second transverse direction (Y) so as to clamp said ribbons (11, 12) pressed on top of one another in order to form a first joining line (GNT1), and at a rotation from - 90° to + 75° around an axis (AX4).
 3. Machine for producing open bows (100), according to anyone of the preceding claims, **characterized in that** said movable clamp (21) fitted on said movable carriage (20) comprises two jaws (22, 23), which are suited to move along said second transverse direction (Y) in order to clamp - or not - said ribbons (11, 12) for the formation of further joining lines ((GNT2), (GNT3), (GNT4)).
 4. Machine for producing open bows (100), according to anyone of the preceding claims, **characterized in that** it further comprises an opposing element (24) with an elongated and box-like shape, said opposing element (24) comprising a front recess (24A) provided with a straight front opposing edge (24B).
 5. Machine for producing open bows (100), according to claim 4, **characterized in that** said opposing element (24) is carried by said carriage (20) and follows its movements along said first longitudinal direction (X).
 6. Machine for producing open bows (100), according to anyone of the preceding claims, **characterized in that** it further comprises spreading means (27, 28), which are inserted, when needed, in at least one of said eyelets ((AS1), (AS2)) so as to prepare the application of a gluing material on at least one joining line ((GNT2), (GNT3)) inside at least one of said eyelets ((AS1), (AS2)).
 7. Machine for producing open bows (100), according to claims 5 and 6, **characterized in that** it further comprises a pushing finger (29), which is inserted in said front recess (24A) on the other side of the afore-said second joining lines ((GNT2), (GNT3)) and opposing said two spreading means (27, 28), which are located inside the eyelets ((AS1), (AS2)).
 8. Machine for producing open bows (100), according to anyone of the preceding claims, **characterized in that** it further comprises two spreading arms (25, 26), which, by opening, act upon the portions of the ribbons (11, 12) behind said movable clamp (21).
 9. Machine for producing open bows (100), according to anyone of the preceding claims, **characterized in that** it further comprises cutting means (CT) to cut said two ribbons (11, 12) so as to obtain two pieces (11A, 12A), which are integral with the rest of a complete bow (FCC).
 10. Machine for producing open bows (100) according to claim 9, **characterized in that** said fixed clamp (30) rotates by 90° in a counterclockwise direction, thus causing the bow (FCC) to be arranged so that the two pieces (11A, 12A) are in the upper part of the bow (FCC) and in a substantially horizontal position.
 11. Machine for producing open bows (100), according to claim 10, **characterized in that** it comprises a further device for the application of adhesive elements (50), which is suited to apply an adhesive element (80) on a complete bow (FCC), in particular on said two pieces (11A, 12A) and on the back of the fourth joining line (GNT4).
 12. A packaging article (ATC) **characterized in that** it comprises a complete bow (FCC) manufactured with the machine for producing open bows (100) according to the claims 1-11, and an adhesive element (80).
 13. Packaging article (ATC), according to claim 12, **characterized in that** said adhesive element (80) is an adhesive element comprising a first face without glue and a second face that can be glued, which is opposite said first face and is provided with a covering layer (SCC) that can easily be removed.



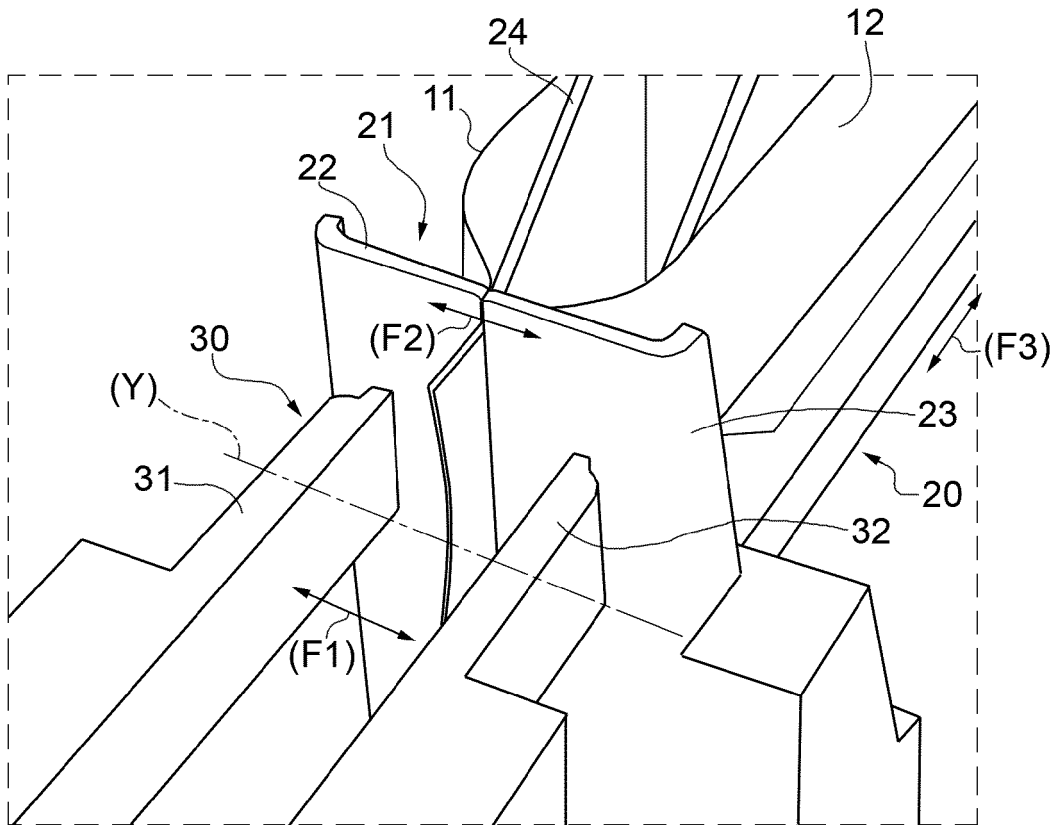


FIG. 2

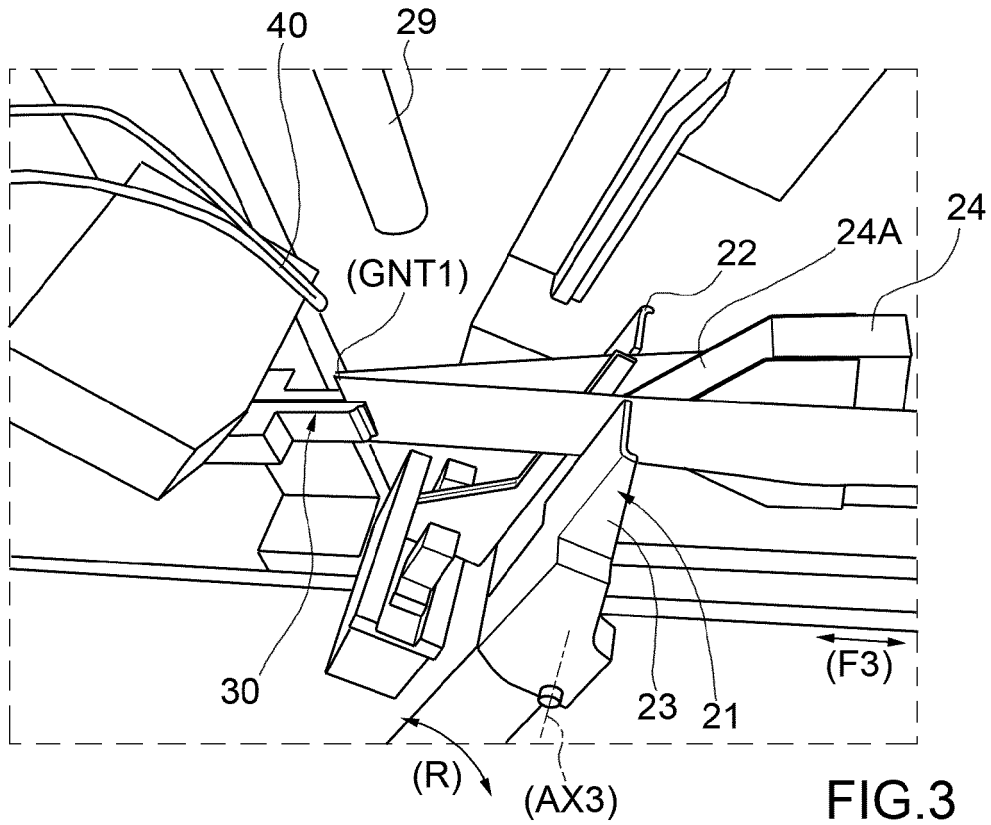


FIG. 3

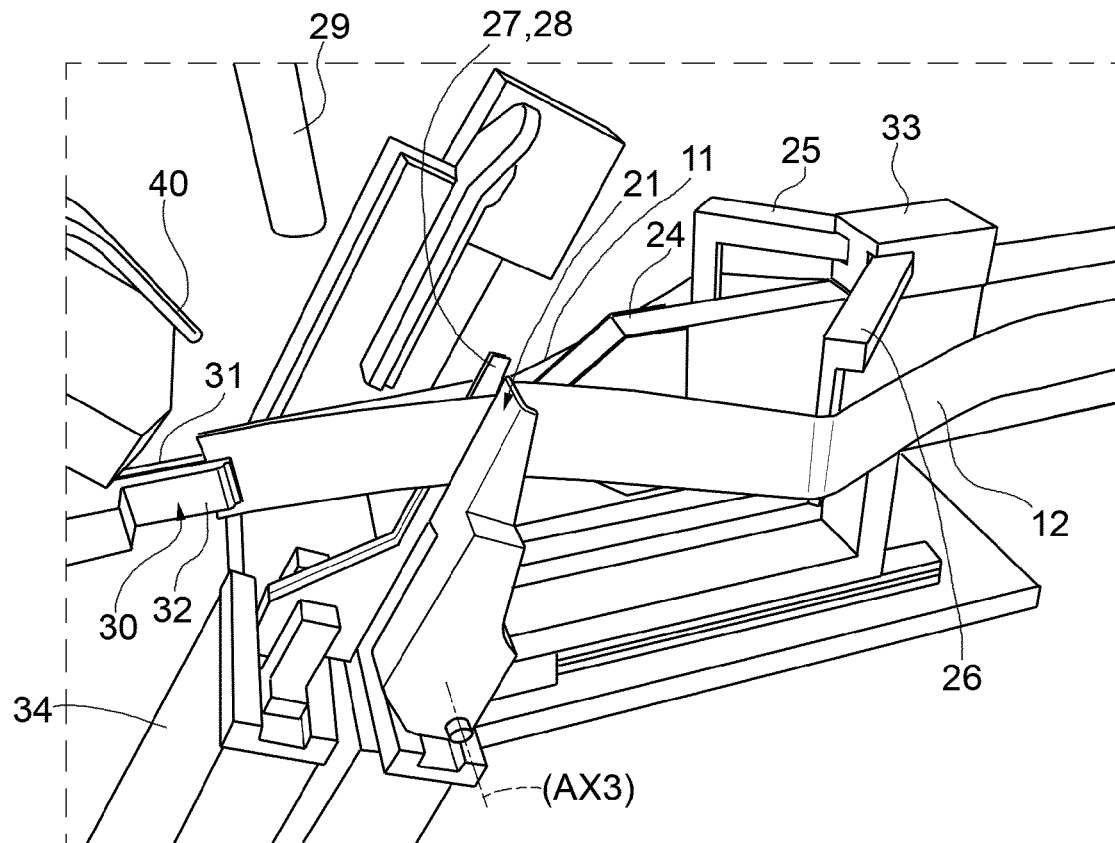


FIG. 4

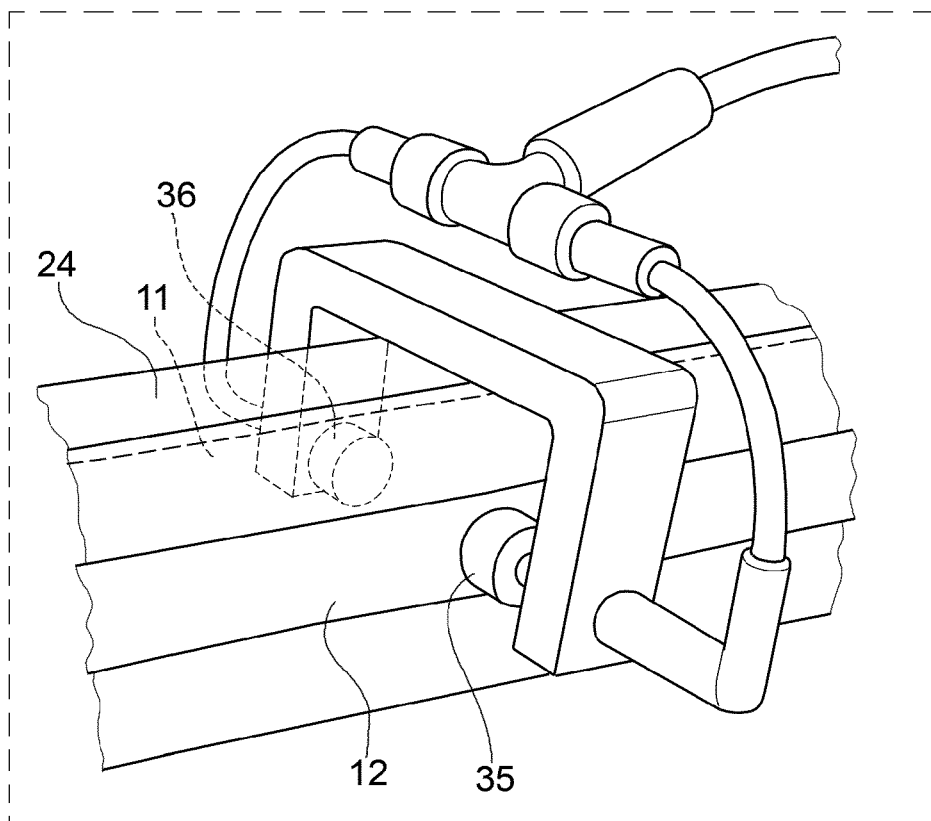


FIG. 5

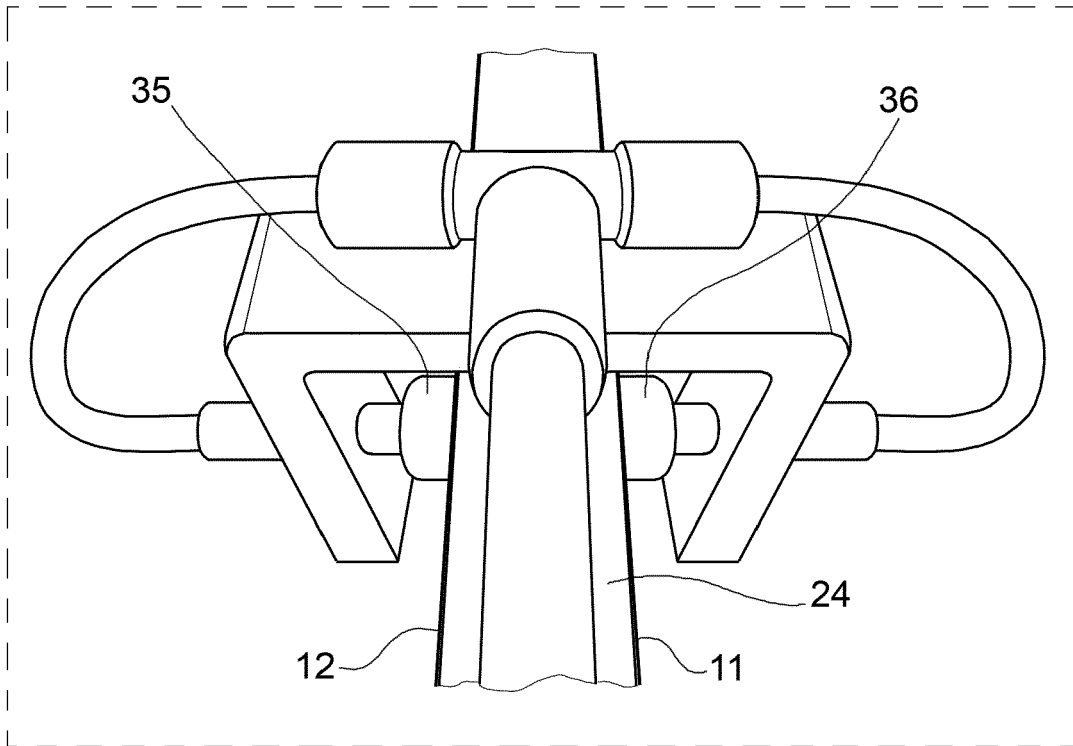


FIG. 6

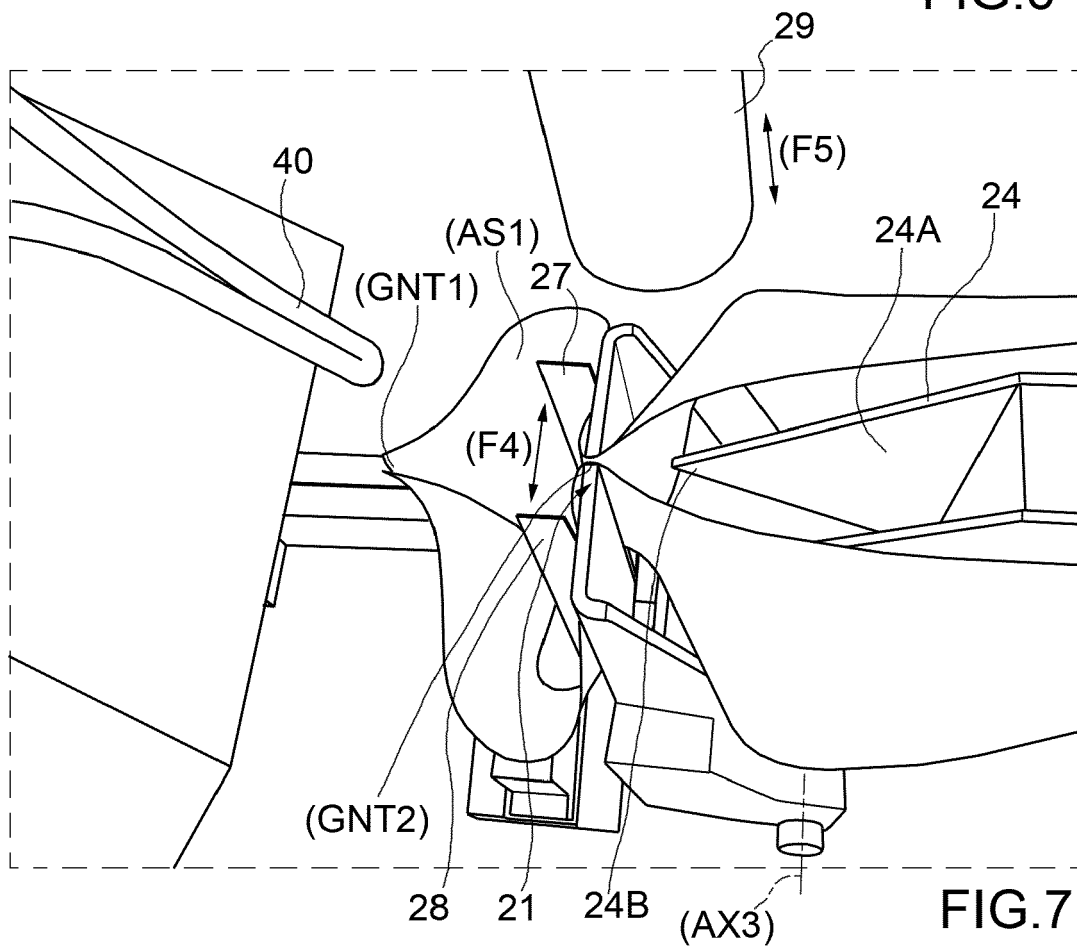


FIG. 7

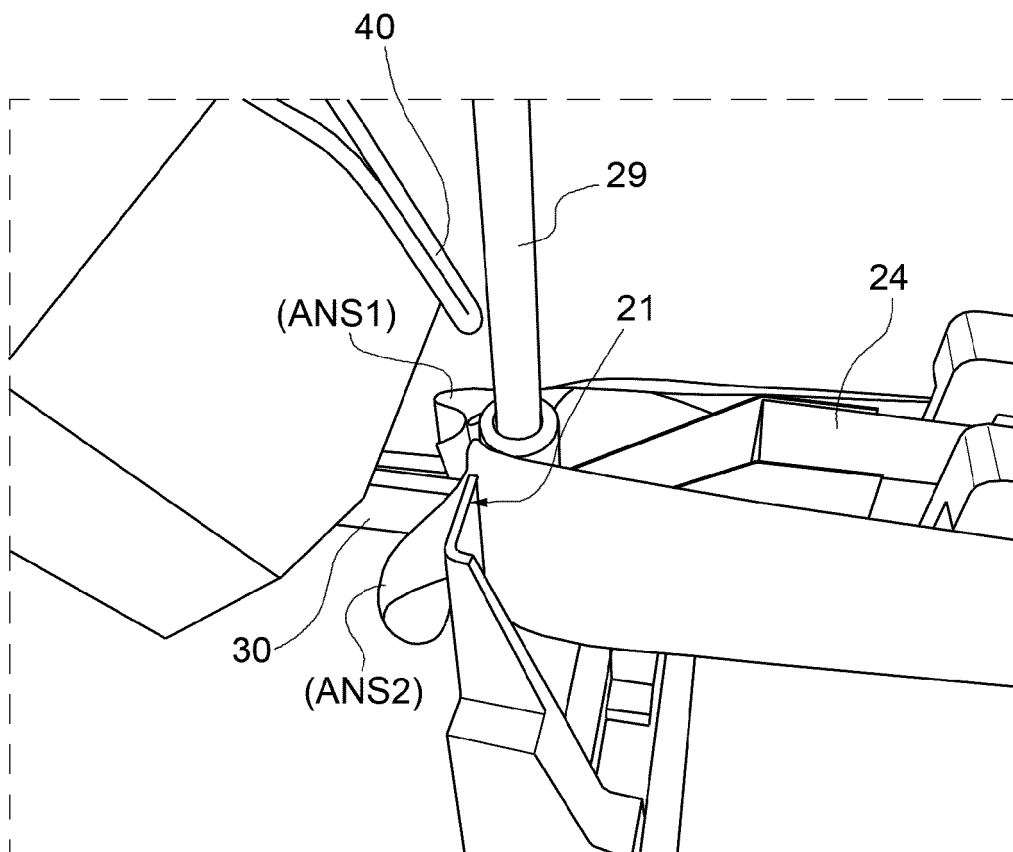


FIG. 8

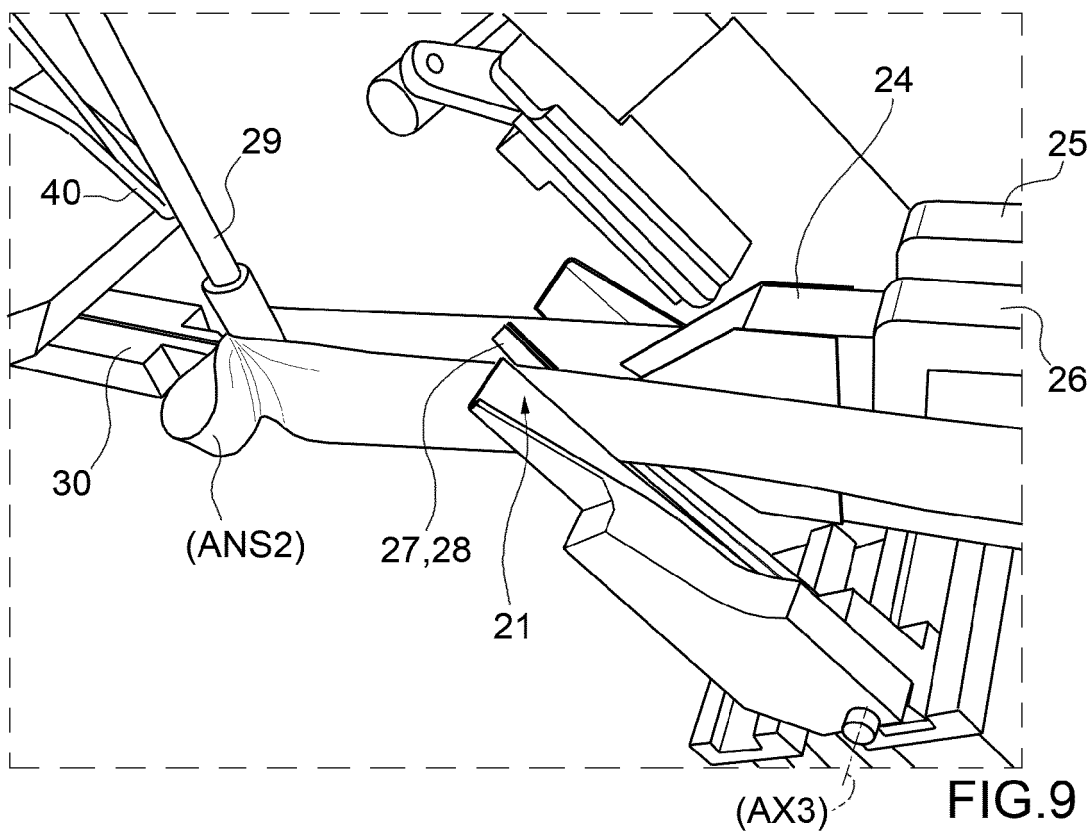


FIG. 9

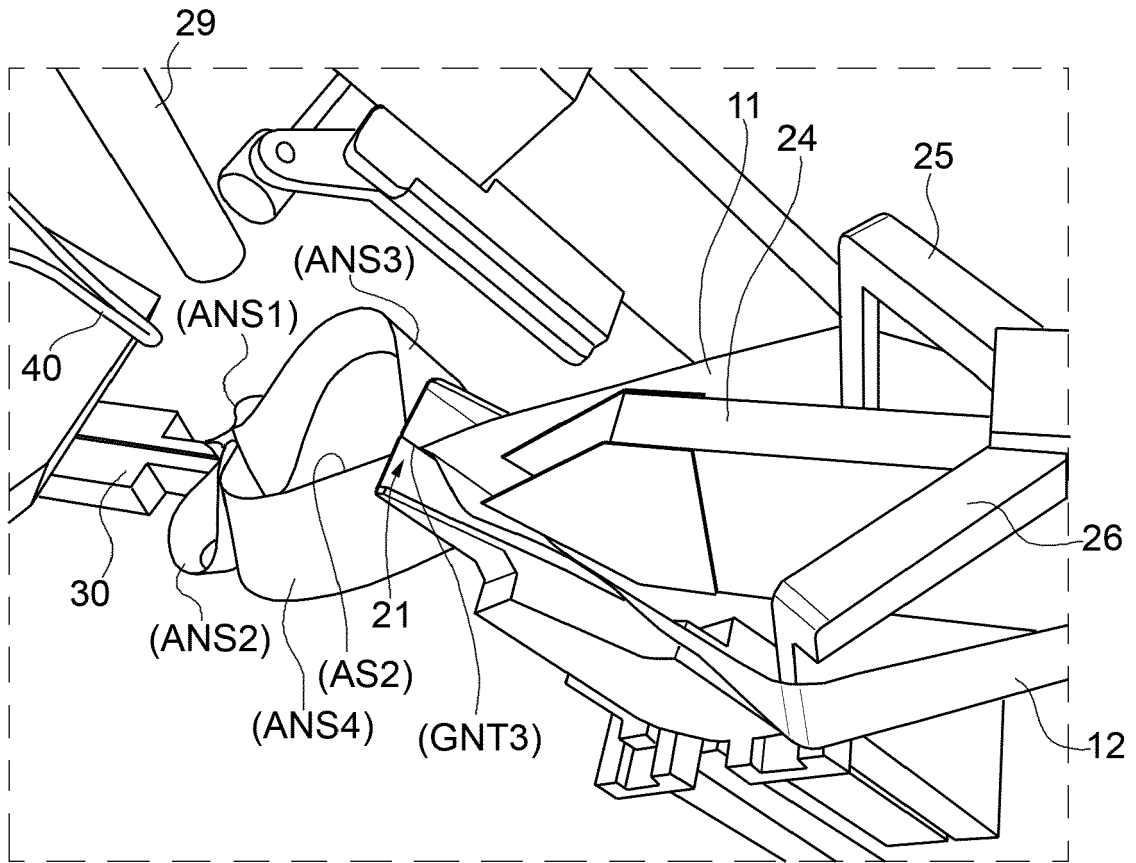


FIG.10

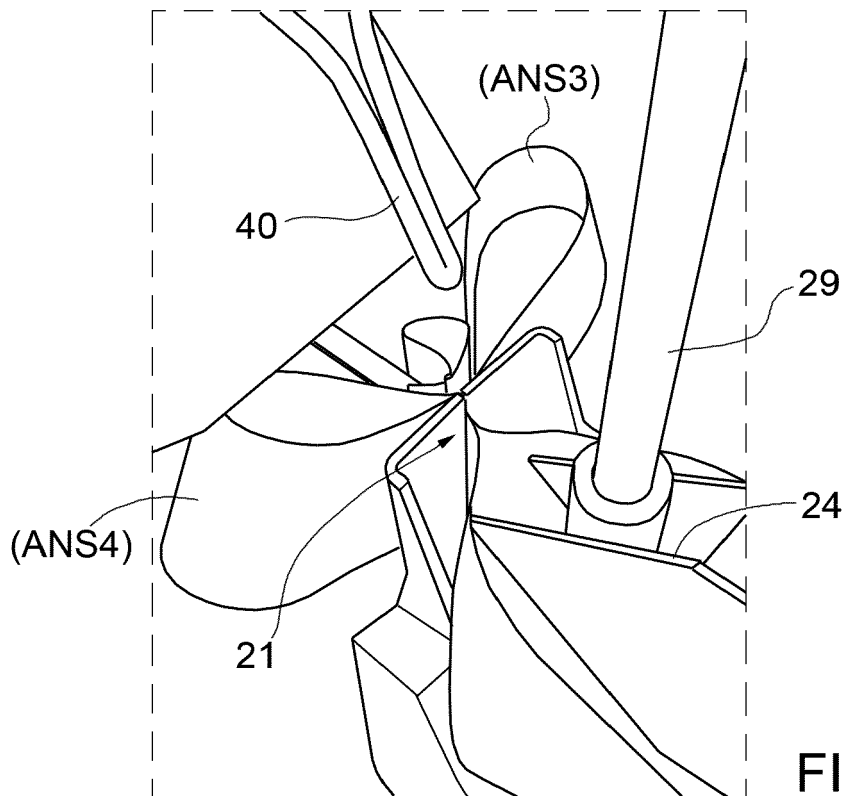


FIG.11

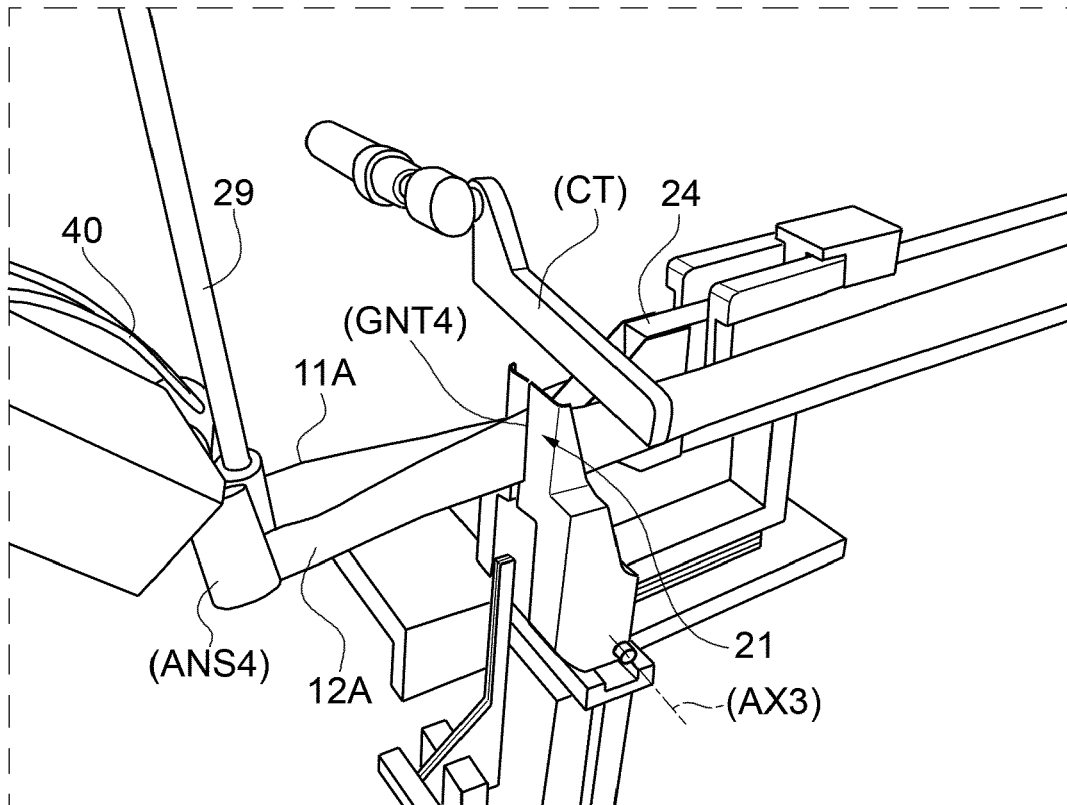


FIG.12

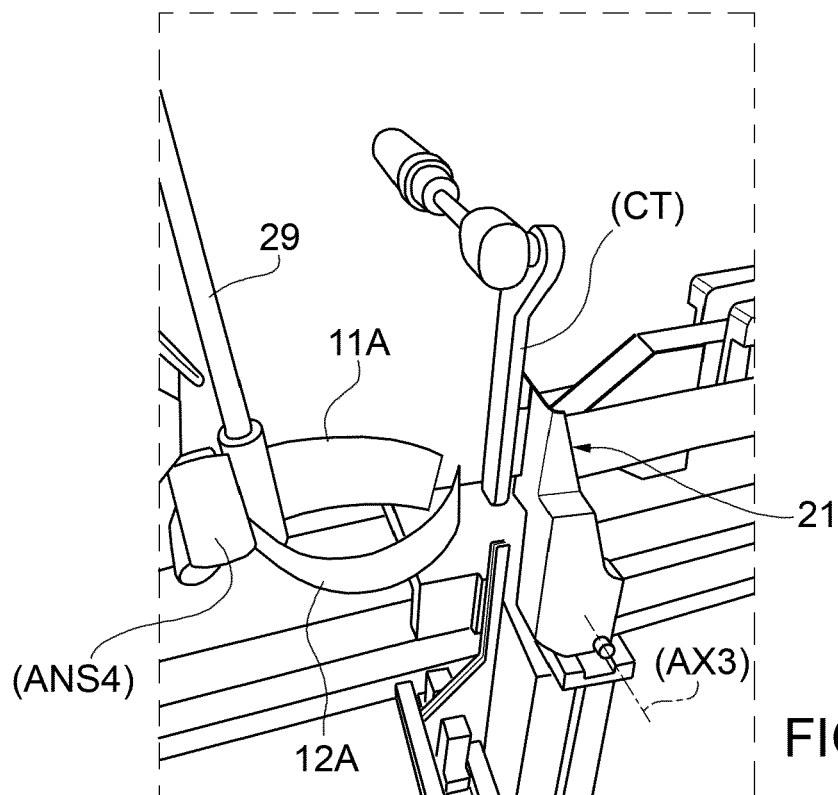


FIG.13

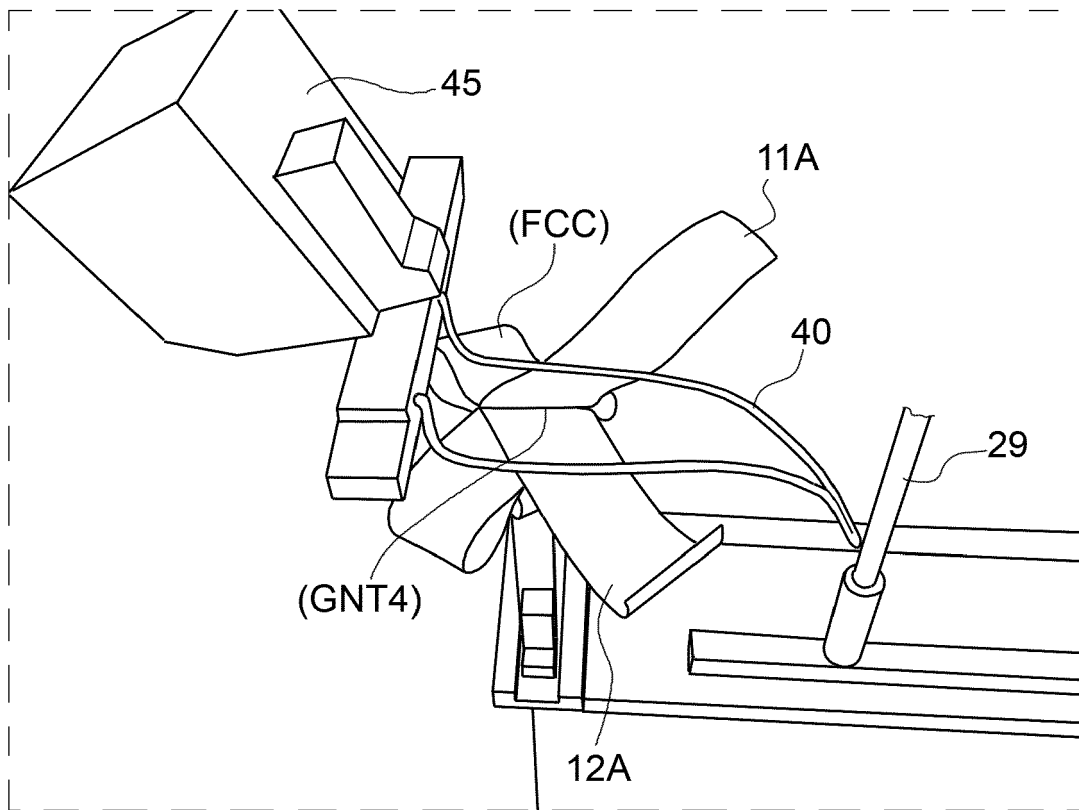


FIG.14

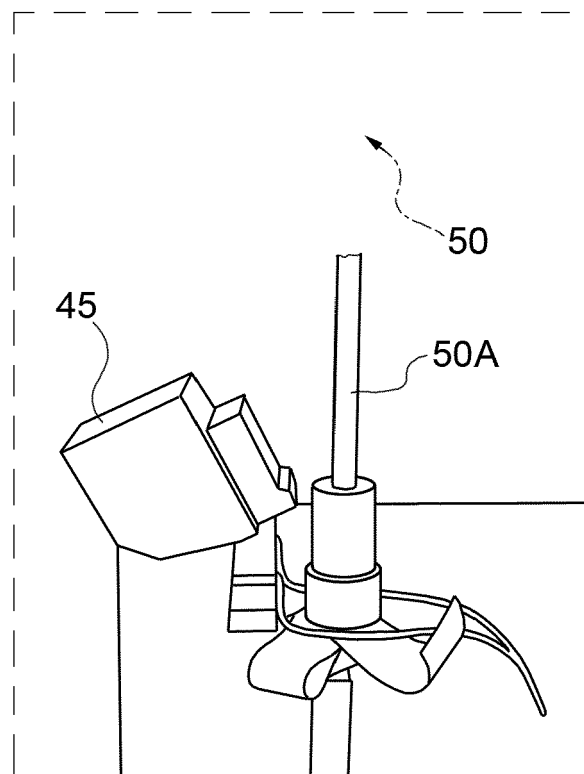


FIG.15

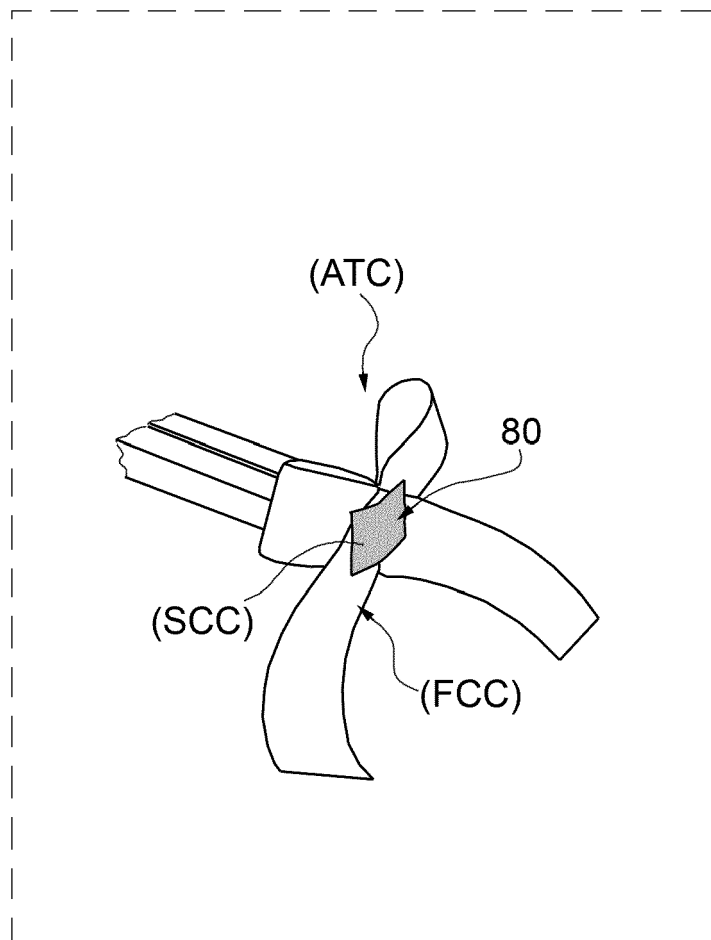


FIG.16

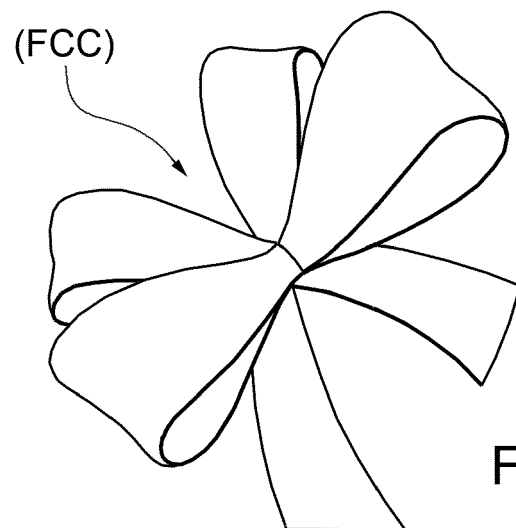


FIG.17



EUROPEAN SEARCH REPORT

Application Number
EP 17 16 9152

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The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 15 September 2017	Examiner Sterle, Dieter
<p>CATEGORY OF CITED DOCUMENTS</p> <p>X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document</p> <p>T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document</p>			

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