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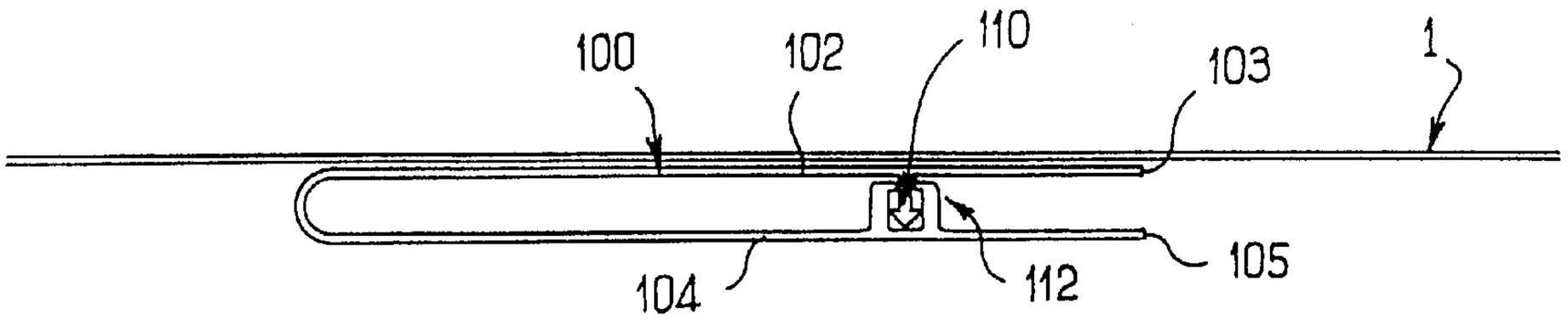
(54) **METHODE ET MACHINE POUR FABRIQUER DES SACS D'EMBALLAGE A L'AIDE D'UNE PELLICULE SOUPLE, ET SACS D'EMBALLAGES AINSI OBTENUS**

(54) **A METHOD AND A MACHINE FOR MAKING PACKAGING BAGS USING A FLEXIBLE FILM, AND A PACKAGING BAG OBTAINED THEREBY**



(57) The present invention relates to a method of automatically forming, filling, and closing reclosable packaging bags based on a film (1) of flexible material, e.g. a thermoplastic material, provided with added-on strips (110, 112) and in particular complementary male and female slideway closure strips, the method comprising the steps consisting in: providing a feed of flexible film (1); providing a feed of strips (110, 112); and fixing the strips (110, 112) on the film (1) by heat sealing; characterized by the fact that: the step of feeding strips consists in providing a tape (100) of flexible material carrying the complementary strips (110, 112); and the step of fixing consists in heat sealing the tape (100) onto the film (1) prior to feeding the resulting assembly (1, 100) to the tube-forming neck of an automatic machine for forming, filling, and closing packaging bags. The invention also relates to machines for implementing the method and to the resulting bags.

A METHOD AND A MACHINE FOR MAKING PACKAGING BAGS USING A FLEXIBLE FILM, AND A PACKAGING BAG OBTAINED THEREBY

A B S T R A C T

The present invention relates to a method of automatically forming, filling, and closing reclosable packaging bags based on a film (1) of flexible material, e.g. a thermoplastic material, provided with added-on strips (110, 112) and in particular complementary male and female slideway closure strips, the method comprising the steps consisting in: providing a feed of flexible film (1); providing a feed of strips (110, 112); and fixing the strips (110, 112) on the film (1) by heat sealing; characterized by the fact that: the step of feeding strips consists in providing a tape (100) of flexible material carrying the complementary strips (110, 112); and the step of fixing consists in heat sealing the tape (100) onto the film (1) prior to feeding the resulting assembly (1, 100) to the tube-forming neck of an automatic machine for forming, filling, and closing packaging bags. The invention also relates to machines for implementing the method and to the resulting bags.

A METHOD AND A MACHINE FOR MAKING PACKAGING BAGS USING A FLEXIBLE FILM, AND A PACKAGING BAG OBTAINED THEREBY

The present invention relates to the field of means for automatically forming, filling, and closing reclosable packaging bags based on flexible films, e.g. of thermoplastic material, and fitted with shaped add-on strips, in particular complementary male and female slideway closure strips.

Numerous machines have already been proposed for this purpose.

Examples thereof can be found in documents US-A-4 894 975 and US-A-4 709 533.

As shown in accompanying Figure 1, automatic machines are known for forming, filling, and closing packaging bags based on films of thermoplastic material fitted with add-on strips and comprising:

• a tube-forming neck 10 which is fed with film 1 in the plane state from pay-out means, and which outputs the film shaped into a tube 2;

• a filling chute 20 which opens out into the forming neck 10 and consequently into said tube 2;

• means 50 for feeding strips 3;

• means 30 for performing longitudinal heat sealing 31 to fix the strips 3 on the longitudinal margins of the film 1 and to seal these longitudinal margins of the films together in order to close the tube 2 longitudinally; and

• means 40 suitable for sequentially generating a first transverse line of heat sealing 42 before a product is inserted into the tube 2 via the filling chute 20, and then a second transverse line of sealing 44 once the product has been inserted into the tube 2, thereby closing a package around the product.

State of the art machines of the kind shown in accompanying Figure 1 have already given good service.

Nevertheless, they do not give complete satisfaction.

In particular, installing the closure strips often turns out to be very difficult and requires regular attention, thereby slowing down the manufacturing process. Also, such installation requires major modifications whenever it is desired to transform conventional automatic machines for forming, filling, and closing packaging bags based on films of thermoplastic materials.

Consequently, an object of the present invention is to improve known automatic machines for forming, filling, and closing reclosable packaging bags based on flexible film material.

According to the present invention, this object is achieved by an automatic machine for forming, filling, and closing reclosable packaging bags based on a film of flexible material, e.g. of thermoplastic material, the film being provided with add-on strips, in particular complementary male and female slideway closure strips, the machine comprising:

- flexible film feed means;
- strip feed means; and
- fixing means for fixing the strips onto the flexible film by heat sealing;

characterized by the fact that:

- the strip feed means are adapted to deliver a tape of flexible material carrying the complementary strips; and
- the fixing means are adapted to heat seal said tape onto the film prior to the resulting assembly being fed to a tube-forming neck.

In a preferred variant embodiment, the tape carrying the complementary strips is folded into a U-shape, and said complementary strips are mutually engaged while the tape is being fixed on the film.

In this context, according to another advantageous characteristic of the invention, the machine comprises:

• means suitable for heat sealing one wing of the tape provided with the closure strips onto a first length of the film;

• means suitable for folding the film over; and

• means suitable for heat sealing the second wing of the tape onto the second length of the film to form a Z-shape at the closure prior to feeding the assembly comprising the film and the tape to the forming neck.

Nevertheless, in another variant of the invention, the tape carrying the closure strips may be in the plane state while it is being heat sealed to the flexible film.

The present invention also provides a method of automatically forming, filling, and closing reclosable packaging bags, and bags obtained by implementing the method.

Other characteristics, objects, and advantages of the invention appear on reading the following detailed description with reference to the accompanying drawings, given as non-limiting examples, and in which:

• Figure 1 is described above and is a diagrammatic perspective view of a state of the art machine;

• Figures 2a, 2b, 2c, and 2d are diagrams showing four successive steps in implementing a method in compliance with a first variant implementation of the present invention;

• Figures 3a, 3b, 3c, and 3d show four successive steps of a second variant of a method in accordance with the invention;

• Figures 4a, 4b, and 4c show three successive steps of a method in accordance with a third variant of the method of the present invention;

• Figures 5a, 5b, and 5c show three successive steps of a fourth variant of a method in accordance with the present invention;

• Figures 6, 7, and 8 are diagrams of three variant bonds in accordance with the present invention between a

film and a tape of flexible material carrying the complementary strips;

• Figures 9 and 10 are respectively a side view and a cross-section view of means for providing bonding between the film and the flexible tape; and

• Figures 11 and 12 are similar, respectively comprising a side view and a cross-section view of a variant embodiment of such means for providing bonding between the film and the flexible tape carrying the strips.

The general structure of the automatic machine for forming, filling, and closing packaging bags of the present invention can be comparable to that of prior known machines of the type shown in Figure 1.

The invention differs from the state of the art as shown in that figure essentially by the fact that the closure strips are not fed to the forming neck and are not fixed on the film at the forming neck, but are fixed on the film upstream from the forming neck.

That is why the general structure of the machine of the present invention is not described below.

The description relates solely to the novel structure of the means for fixing the closure strips on the film.

A first variant embodiment in accordance with the present invention and as shown in Figures 2a to 2d is described initially.

In Figure 2a, there can be seen a flexible film 1 in the plane state as taken from a pay-out spool, for example, and a tape 100 of flexible material which carries the complementary closure strips 110 and 112. More particularly, in the variant embodiment of Figures 2a to 2d, the tape 100 is folded over in a U-shape and the complementary strips 110 and 112 are in mutual engagement when the tape 100 is brought up to the film 1, as shown in Figure 2a.

As shown in Figure 2b, means then perform heat sealing on the wing 102 of the tape 100 that is adjacent to the film 1. In Figure 2b, the zone of sealing between the wing 102 and the film 1 is referenced 150. It will be observed that this zone of sealing 150 is preferably confined to a region situated beyond the strips 110 and 112, i.e. between the strips 110 and 112, and the free edges 103, 105 of the wings 102, 104 of the tape 100.

Almost simultaneously with this heat sealing 150, the film 1 is cut longitudinally at 160 in the vicinity of said heat sealing 150.

As can be seen in Figure 2b, the cut 160 is preferably formed on the side of the line of heat sealing 150 that is further from the opening of the U-shaped tape 100.

After being cut along the line 160, the film 1 is in the form of two lengths: a first length 1a having the tape 100 fixed thereto by a zone of heat sealing 150, and a second length 1b that is separate therefrom.

In the third step shown in Figure 2c, the first length 1a of film is folded over through 180° so that the wing 102 of the tape 100 comes to be adjacent to the surface of the length 1a that is opposite to the surface with which it was previously adjacent.

In the fourth step shown in Figure 2d, the second length 1b is brought up to the margin 105 of the second wing 104 of the tape 100 and is heat sealed to said wing 104 via a zone of heat sealing referenced 152.

It will be observed that in this state, the U-shaped tape 100 in combination with the 180° fold 170 forms a Z-shape.

The assembly comprising the film 1 plus the tape 100 as shown in Figure 2d can then be fed to a forming neck comparable to that shown in Figure 1 so as to shape the film into a tubular state and form and close bags from the tubular film by longitudinal and transverse heat

sealing means like the means referenced 30 and 40 in Figure 1.

In the variant shown in Figures 2a to 2d, the tape 100 has its outside surface heat sealed to the lengths 1a and 1b of the film 20. Nevertheless, it is possible to envisage heat sealing the wings 102 and 104 of the tape 100 to the lengths 1a and 1b of the film via their inside surfaces.

In yet another embodiment, it is possible to use two lengths of film 1a and 1b that are initially separate before bringing up the tape 100, instead of being separated only during the second step by means of the longitudinal line of cut 160.

A second variant embodiment in accordance with the present invention and as shown in Figures 3a and 3d is described below.

In Figure 3a, there can be seen a tape 100 folded into a U-shape and carrying complementary strips 110 and 112 that are mutually engaged and adjacent to a film 1 via one of its wings 102.

During the step shown in Figure 3b, the free end of the wing 102 of the tape 100 is heat sealed at 150 to the film 1, in a manner comparable to Figure 2b.

During the step shown in Figure 3c, the film 1 is folded over to form a 180° fold 170 adjacent to the margin 103 of the wing 102 and then around the U-shaped tape 100 via a second fold 172 that is also through 180°.

In the step shown in Figure 3d, the second wing 104 of the tape 100 is heat sealed close to its free margin 105 to the now-adjacent second length 1b of the film in a heat sealing zone 152.

In this case also, the assembly comprising the film 1 and the tape 100 as obtained in this way is then fed to the tube-forming neck of a conventional machine for forming, filling, and closing bags.

It will be observed that it is preferable to place a thermally insulating spacer between the free ends of the

wings 102 and 104 while performing heat sealing 150 and 152 so as to avoid directly sealing the margins 103 and 105 of the wings together; it is also possible to use a tape 100 with an inside surface having a melting point that is higher than that of its outside surface.

The variants shown in Figures 4 and 5 differ from those shown in Figures 2 and 3 essentially by the fact that the tape 100 carrying the strips 110 and 112 is in the flat state while being sealed onto the film 1.

The third variant embodiment as shown in Figure 4a is described below.

Thus, Figure 4a shows a plane tape 100 fitted with complementary closure strips 110, 112 placed adjacent to a plane film 1, and Figure 4b shows the same plane tape 100 heat sealed to the plane film 1 in the vicinity of its ends, in two zones 150 and 152.

It will be observed that where appropriate the tape 100 could be heat sealed to the film 1 over the entire width of its surface adjacent thereto.

Starting from the state shown in Figure 4b, the assembly comprising the film 1 and the tape 100 can be fed in the flat state to the forming neck, with the strips 110 and 112 being brought progressively into engagement in the forming neck by using the means shown in Figures 1 to 6 of document FR-A-2 583 018.

However, in another variant, and as shown in Figure 4c, the assembly comprising the film 1 and the tape 100 as shown in Figure 4b can be given a Z-shaped fold prior to being transferred to the forming neck of a conventional machine for forming, filling, and closing bags. While the film 1 is being folded, it can be seen that the strips 110 and 112 are brought into engagement by the tape 100 being folded over into a U-shape.

Still more precisely, the film 1 is folded into a Z-shape by means of a first 180° fold 170 adjacent to one of the ends of the wings of the tape 100, and a second

180° fold 172 on the outside of the tape 100 and halfway therealong.

The fourth variant embodiment as shown in Figures 5a to 5c is described below.

This fourth variant embodiment is similar to the third variant shown in Figures 4a to 4c in that the tape 100 is brought up to the film 1 and is heat sealed thereto while in the plane state, as shown in Figures 5a and 5b.

However, unlike the third variant shown in Figures 4, in the fourth variant embodiment, the margins 103 and 105 of the tape 100 are fixed to respective different lengths 1a and 1b of the film 1.

The assembly comprising the two lengths 1a and 1b of the film 1 interconnected by the plane tape 100 carrying the closure strips 110 and 112 can be conveyed in the plane state to the forming neck of an automatic machine for forming, filling, and closing bags, and then the strips 110 and 112 can be moved progressively towards each other and brought into mutual engagement by the means shown in Figures 3 to 6 of document FR-A-2 508 013, or Z-folding can be performed as shown in Figure 5c by forming a 180° fold 170 in one of the lengths 1a or 1b of the film 1 so that it is folded over close to the margin 103, 105 of one of the wings 102, 104 of the tape 100.

Starting from this state, the assembly comprising the film 1 and the tape 100 folded into a Z-shape can, in like manner, be fed conventionally to the forming neck of an automatic machine for forming, filling, and closing bags.

The film 1 used in the context of the invention may comply with dispositions known to the person skilled in the art.

The same applies to the closure strips 110 and 112.

Where appropriate, and in conventional manner, the strips 110 and 112 may be associated with one or more

cords included in the tape 100 to facilitate opening packaging bags.

Such cords are intended to cut through the tape 100 and the film 1 when traction is applied to the outside of the strips 110 and 112, and they are well known to the person skilled in the art.

The term "easy open" is commonly applied to them.

Naturally, the present invention is not limited to the particular embodiments described above, but it extends to any variant within its spirit.

In particular, the invention is not limited to forming bags based on thermoplastic material film.

The invention can also be applied to forming bags based on flexible film of some other kind, e.g. based on aluminum or on paper.

Also, although the invention is applicable to films of thermoplastic material provided with complementary male and female slideway closure strips, as described above, the invention is not limited to using that particular type of strip.

The invention extends to any type of strip 110, 112 suitable for being fitted to a packaging film, e.g. cords integrated in the film to facilitate opening the package, decorative borders, e.g. colored borders, or indeed graduated borders for identifying the volume of product contained in the package.

Also, the invention is naturally not limited to the particular shape of complementary strips 110 and 112 shown in the accompanying figures.

Figure 6 shows a variant embodiment in which the tape 100 is folded into a U-shape during the step of bonding the film 1 to the tape 100 carrying the complementary strips 110, 112, while the film 1 is split into two mutually parallel and substantially adjacent sheets 1a and 1b. In Figure 6, the two sheets 1a and 1b are of identical width. Nevertheless, this condition is not essential.

In Figure 6, the free ends of the tape 100 are disposed between the free ends of the sheets 1a and 1b. The heat-sealing zones defined between the sheets 1a and 1b and the ends of the tape 100 are referenced 150 and 152.

In a variant, it is nevertheless possible to provide for the ends of the tape 100 to be located outside the sheets 1a and 1b, and not between them.

Figure 7 shows a variant in which the film 1 is not made up of two separate sheets 1a and 1b, but of a single film that is folded over into a U-shape and whose free ends are fixed respectively to the ends of the tape 100. In Figure 7, the ends of the film 1 are placed outside the ends of the tape 100, but in a variant they could be placed inside them.

The variant of Figure 7 requires the film 1 to be cut longitudinally at some arbitrary location in order to allow subsequent insertion in the neck of the machine.

Figure 8 shows another variant in which the film is folded into a U-shape and the web of the U formed in this way in the film 1 is placed between two wings of the tape 100 which is itself U-shaped. In this position, the film 1 also defines two parallel adjacent sheets 1a and 1b that are united by the above-mentioned U-shaped web. In this case, the film 1 is preferably provided with a zone of weakness 1d at the web 1c, e.g. in the form of a pre-tear line or a perforated line, that is preferably centrally located.

The variant of Figure 8 makes it possible to achieve sealing. Where appropriate, the line of perforations 1d could be covered with a sealing strip.

The link zones 150 and 152 can be obtained by heat sealing or by adhesive.

The sheets 1a and 1b shown in Figures 6, 7, and 8 may be open, i.e. they may be separated, by any appropriate means, so that the film 1 reaches the inlet to the forming neck in a substantially plane state.

Figures 9 to 12 show means designed to bond the tape 100 to the film 1. In these Figures 9 to 12, reference 200 designates a roll for conveying the film 1 with a 90° bend, reference 210 designates a heat-sealing blade, and reference 220 a backing blade.

In the implementations shown in Figures 9 to 12, the ends of the U-shaped tape 100 are folded outwardly through 90° so that the general shape of the tape 100 is a U-shape.

The web of the tape 100 is disposed in a complementary longitudinal groove 222 formed in the backing blade 220. The ends of the tape 100 define coplanar lengths 100a and 100b disposed between the facing adjacent faces of the blade 210 and the backing blade 220. The film 1 is also conveyed between the blade 210 and the backing blade 220, thereby enabling them to perform bonding between the film 1 and the lengths 100a and 100b of the tape 100, by applying pressure together with heat.

Still more precisely, in Figures 9 and 10, the roll 200 is disposed beneath the tape 100 that is folded into a T-shape. Consequently, the roll 200 includes an annular groove opening out into its periphery for passing the web of the tape 100. Also, in Figures 9 and 10, the film 1 is conveyed between the blade 210 and the backing blade 220 in the form of two separate lengths 1a and 1b.

In Figures 11 and 12, the roll 200 is placed above the tape 100. In this case, the film 1 can be continuous and, where appropriate, it may be provided with tearable perforations or the equivalent 1d, as described above.

WHAT IS CLAIMED IS:

1/ A method of automatically forming, filling, and closing reclosable packaging bags based on a film (1) of flexible material, e.g. a thermoplastic material, provided with added-on strips (110, 112) and in particular complementary male and female slideway closure strips, the method comprising the steps consisting in:

- providing a feed of flexible film (1);
- providing a feed of strips (110, 112); and
- fixing the strips (110, 112) on the film (1) by heat sealing;

characterized by the fact that:

- the step of feeding strips consists in providing a tape (100) of flexible material carrying the complementary strips (110, 112); and
- the step of fixing consists in heat sealing the tape (100) onto the film (1) prior to feeding the resulting assembly (1, 100) to the tube-forming neck of an automatic machine for forming, filling, and closing packaging bags.

2/ A method according to claim 1, characterized by the fact that the tape (100) is folded over into a U-shape and the strips (110, 112) that it carries are mutually engaged while the tape (100) is being fixed onto the film (1).

3/ A method according to claim 1 or 2, characterized by the fact that it comprises the steps consisting in:

- heat sealing one wing (102) of the tape (100) carrying the closure strips (110, 112) onto a first length (1a) of the film (1);
- folding the film (1) over; and
- heat sealing the second wing (104) of the tape (100) onto the second length (1b) of film (1) to form a Z-shape at the closure prior to feeding the assembly comprising the film (1) and the tape (100) to the forming

neck of an automatic machine for forming, filling, and closing bags.

4/ A method according to claim 1, characterized by the fact that the tape (100) carrying the strips (110, 112) is in the plane state during the step of heat sealing onto the film (1).

5/ A method according to clam 4, characterized by the fact that the assembly comprising the film (1) and the tape (100) is fed in the flat state to the forming neck, with the strips (110, 112) being moved progressively towards each other and brought into engagement in the forming neck.

6/ A method according to claim 4, characterized by the fact that the assembly comprising the film (1) and the tape (100) is deformed into a Z-shape to enable the strips (110, 112) to engage, prior to being transferred to the forming neck.

7/ A method according to any one of claims 1 to 6, characterized by the fact that the two wings (102, 104) of the tape (100) are respectively heat sealed to two lengths (1a, 1b) of the film (1) which are secured to each other.

8/ A method according to any one of claims 1 to 6, characterized by the fact that the two wings (102, 104) of the tape (100) are respectively heat sealed to two lengths (1a, 1b) of film (1) which are separate from each other.

9/ A method according to any one of claims 1, 2, 7, and 8, characterized by the fact that the film (1) is made up of two parallel adjacent lengths (1a, 1b) during the step of fixing the strip (100).

10/ A method according to claim 9, characterized by the fact that the two lengths (1a, 1b) of the film are separate during the fixing step.

11/ A method according to claim 9, characterized by the fact that the two lengths (1a, 1b) are formed by a U-shaped fold in the film (1) during the fixing step.

12/ A method according to claim 11, characterized by the fact that the U-shaped web of the film (1) is placed in the U-shaped tape (100) carrying the closure strips.

13/ A method according to claim 12, characterized by the fact that the film (1) is provided with a zone of weakness, e.g. in the form of tearable perforations in its zone placed in the tape (100).

14/ A method according to claim 11, characterized by the fact that the free ends of the film (1) folded into a U-shape are fixed respectively on the ends of the strip (100), and that the method further includes the step consisting in cutting the film (1) longitudinally before inserting it on the forming neck.

15/ A method according to any one of claims 1, 2, 4, 5, and 7 to 14, characterized by the fact that the tape (100) carrying the closure strip (110, 112) is placed at its free ends at 90° to a U-shaped web in order to define a general T-shape during the step of being fixed to the film (1).

16/ A method according to any one of claims 1 to 15, characterized by the fact that it is implemented on an automatic machine for forming, filling, and closing bags, the machine comprising:

• a forming neck (10) which has the film (1) in the plane state fed thereto and which delivers the film shaped into a tube (2);

• a filling chute (20) which opens out into the forming neck (10) and consequently into said tube (2);

• longitudinal heat sealing means (30) for fixing together the longitudinal edges of the film in order to close the tube (2) longitudinally; and

• means (40) suitable for sequentially generating a first transverse line of heat sealing (42) prior to a product being inserted into the tube via the filling chute (20), and then a second transverse line of heat sealing (44) once the product has been inserted into the tube (2), in order to close the package around the product.

17/ A method according to any one of claims 1 to 16, characterized by the fact that it includes an additional step consisting in inserting a thermally insulating spacer between the wings (102, 104) of the tape (100) folded into a U-shape, prior to performing the operations of heat sealing onto the film (1).

18/ A method according to any one of claims 1 to 17, characterized by the fact that the tape (100) is heat sealed to the film (1) via the inside surfaces of its wings (102, 104).

19/ A method according to any one of claims 1 to 17, characterized by the fact that the tape (100) is heat sealed onto the film (1) via the outside surfaces of its wings (102, 104).

20/ An automatic machine for forming, filling, and closing reclosable packaging bags based on a film of flexible material (1), e.g. of thermoplastic material, the film being provided with add-on strips (110, 112), in

particular complementary male and female slideway closure strips, the machine comprising:

- flexible film feed means;
- strip feed means; and
- fixing means for fixing the strips (110, 112) onto the flexible film (1) by heat sealing;

characterized by the fact that:

- the strip feed means are adapted to deliver a tape (100) of flexible material carrying the complementary strips (110, 112); and
- the fixing means are adapted to heat seal said tape (100) onto the film (1) prior to the resulting assembly (1, 100) being fed to a tube-forming neck.

21/ A machine according to claim 20, characterized by the fact that the tape (100) is folded over into a U-shape and the strips (110, 112) are mutually engaged during fixing onto the film (1).

22/ A machine according to claim 20 or 21, characterized by the fact that it comprises:

- means suitable for heat sealing one wing (102) of the tape (100) provided with the closure strips (110, 112) onto a first length (1a) of the film (1);
- means suitable for folding the film (1) over; and
- means suitable for heat sealing the second wing (104) of the tape (100) onto the second length (1b) of the film (1) to form a Z-shape at the closure prior to feeding the assembly comprising the film (1) and the tape (100) to the forming neck.

23/ A machine according to claim 20, characterized by the fact that the flexible tape (100) is in the plane state while it is being heat sealed onto the film (1).

24/ A machine according to claim 23, characterized by the fact that it includes means suitable for conveying the

assembly comprising the film (1) and the tape (100) in the flat state to the forming neck, and means suitable for progressively moving the strips (110, 112) towards each other and bringing them into engagement in the forming neck.

25/ A machine according to claim 23, characterized by the fact that it includes means suitable for deforming the assembly comprising the film (1) and the tape (100) into a Z-shape to bring the strips (110, 112) into engagement, prior to being transferred to the forming neck.

26/ A machine according to any one of claims 20 to 25, characterized by the fact that the two wings (102, 104) of the tape (100) are heat sealed respectively to two lengths (1a, 1b) of the film (1) which are secured to each other.

27/ A machine according to any one of claims 20 to 25, characterized by the fact that the two wings (102, 104) of the tape (100) are heat sealed respectively to two lengths (1a, 1b) of the film (1) which are separate from each other.

28/ A machine according to any one of claims 20 to 27, characterized by the fact that it comprises:

- a forming neck (10) which has the film (1) in the plane state fed thereto and which delivers the film shaped into a tube (2);
- a filling chute (20) which opens out into the forming neck (10) and consequently into said tube (2);
- longitudinal heat sealing means (30) for fixing together the longitudinal edges of the film in order to close the tube (2) longitudinally; and
- means (40) suitable for sequentially generating a first transverse line of heat sealing (42) prior to a product being inserted into the tube via the filling

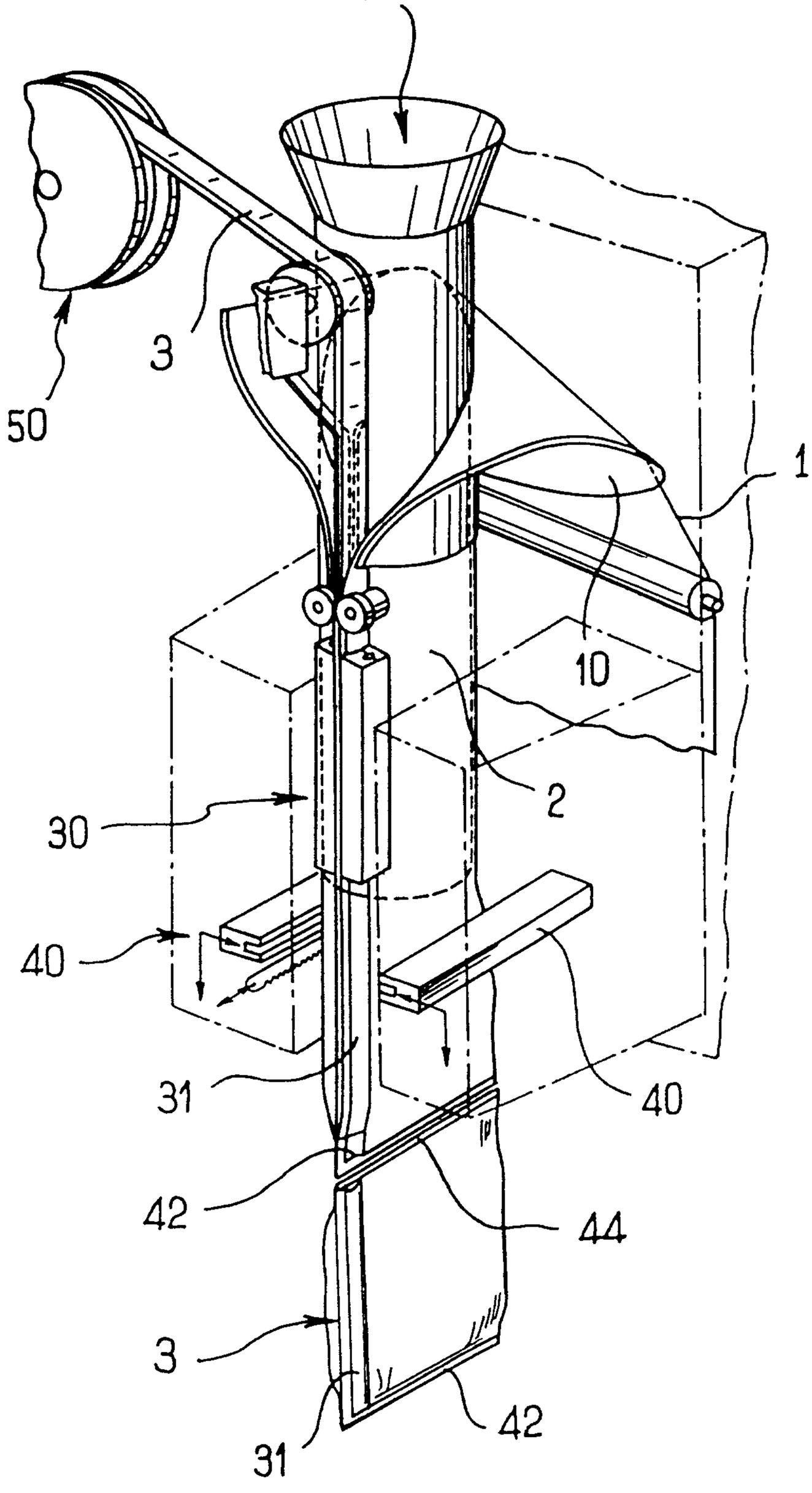
chute (20), and then a second transverse line of heat sealing (44) once the product has been inserted into the tube (2), in order to close the package around the product.

29/ A machine according to any one of claims 20 to 28, characterized by the fact that it further comprises a thermally insulating spacer adapted to be inserted between the two wings of the tape (100) during the heat sealing operations.

30/ A machine according to claim 20, characterized by the fact that the means for fixing the tape (100) on the film (1) comprise a heat-sealing blade (210) and a backing blade (220) including a longitudinal groove (222) for receiving the web of the tape (100) that is folded into a T-shape.

31/ A reclosable packaging bag obtained by implementing the method according to any one of claims 1 to 19.

FIG.1 PRIOR ART



Fenlayson & Singlehurst
PATENT AGENTS

FIG_2a

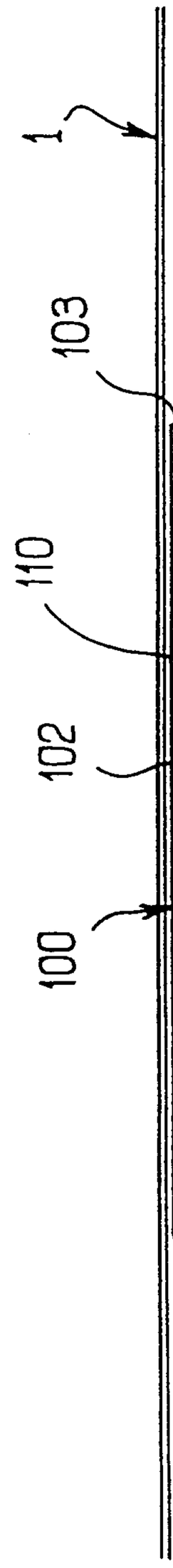


FIG_2b

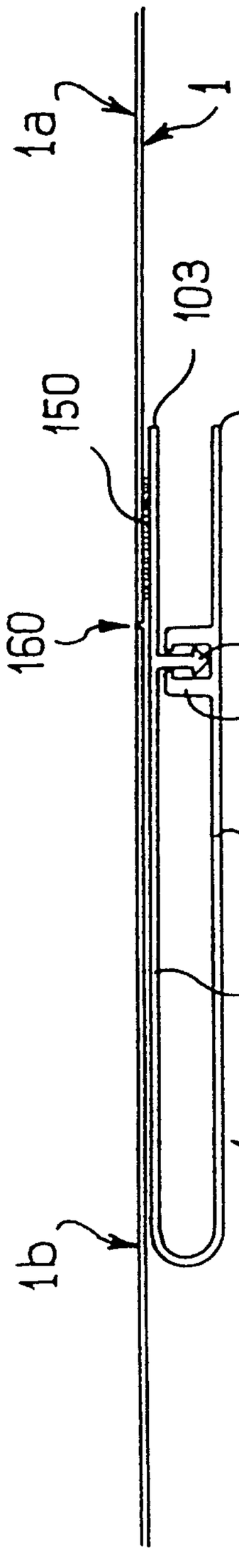


FIG_2c

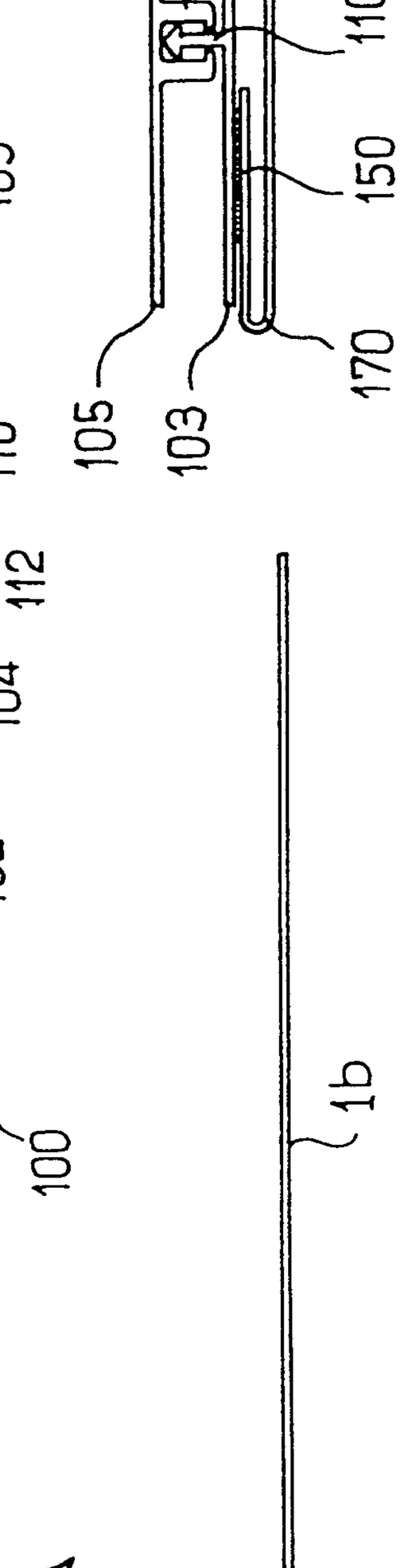


FIG_2d

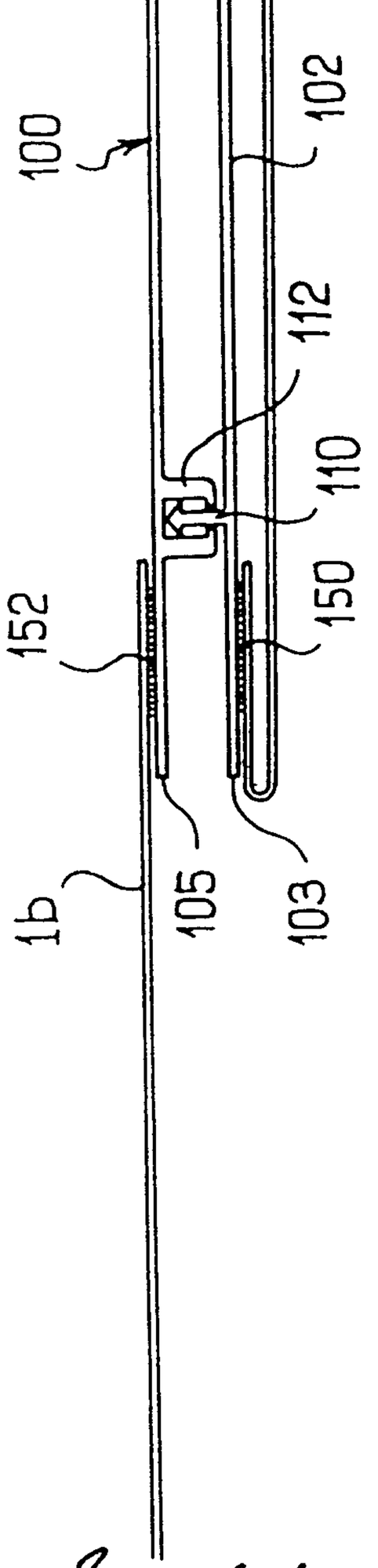


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FIG.3a

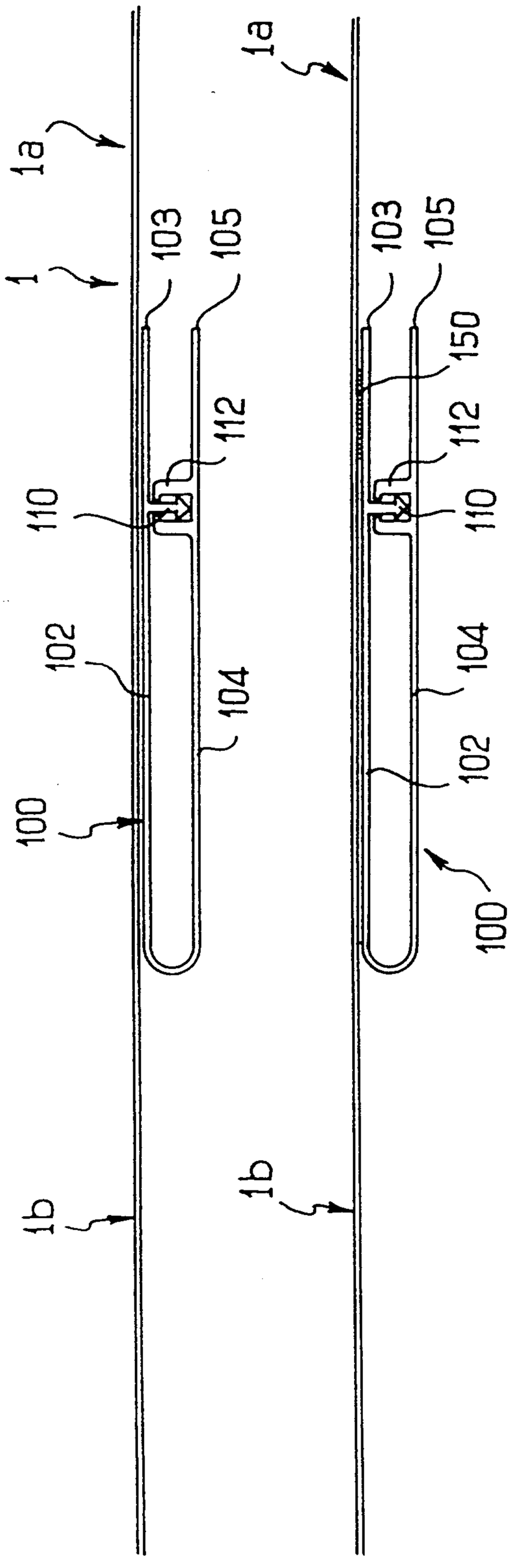

FIG.3b

FIG.3c

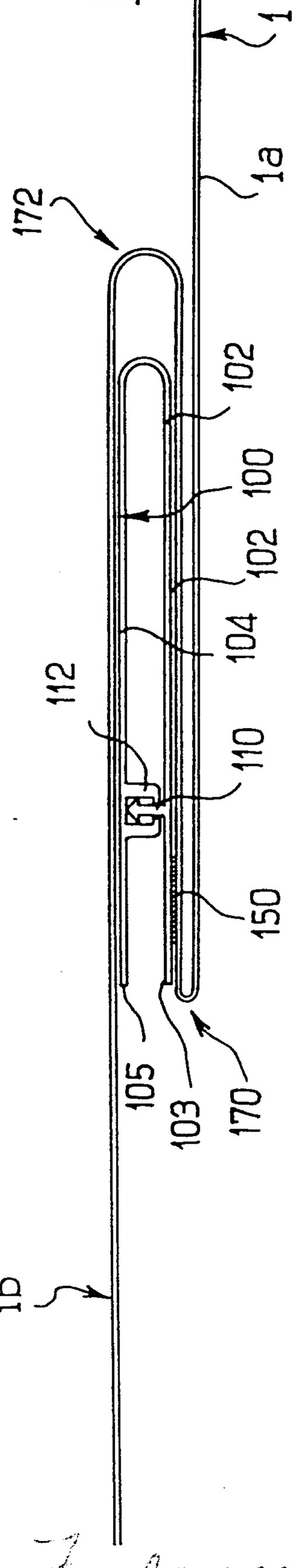

FIG.3d

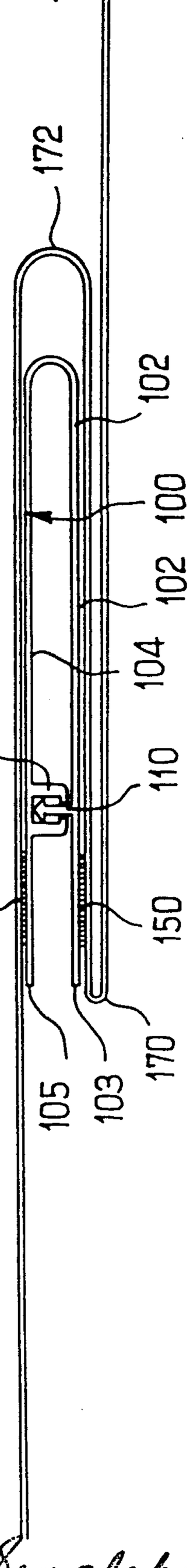

FIG_4a

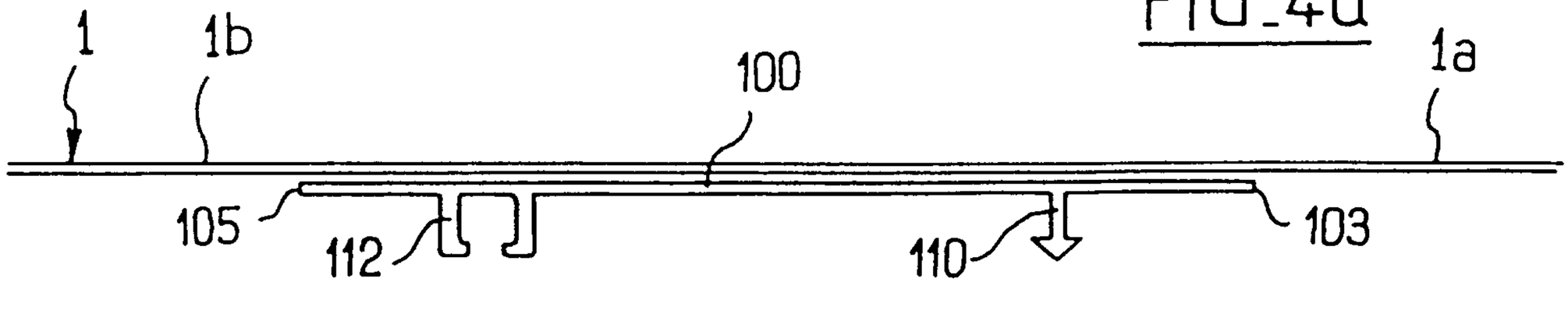

FIG_4b

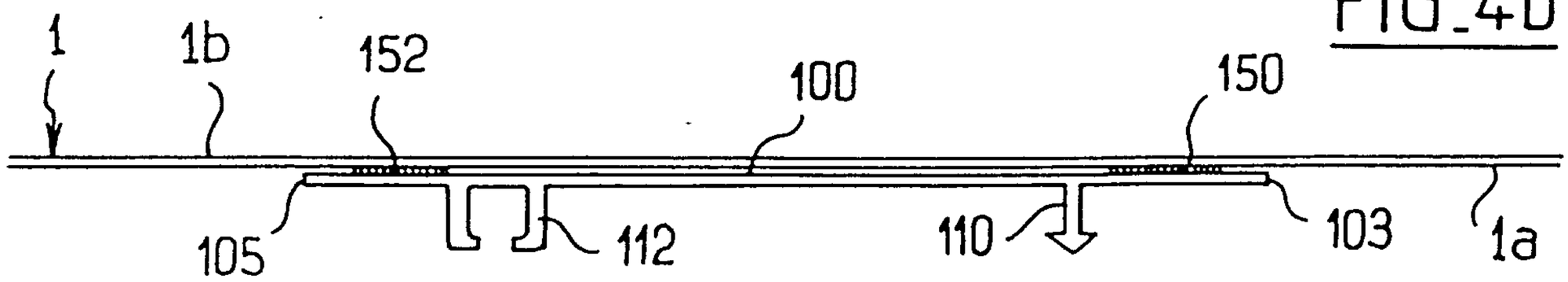

FIG_4c

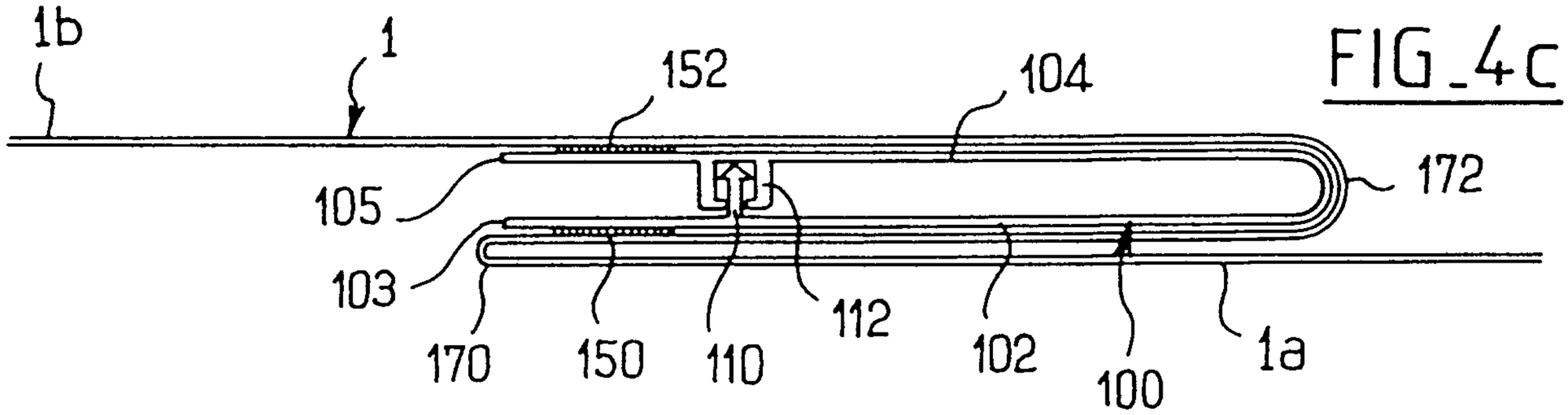

FIG_5a

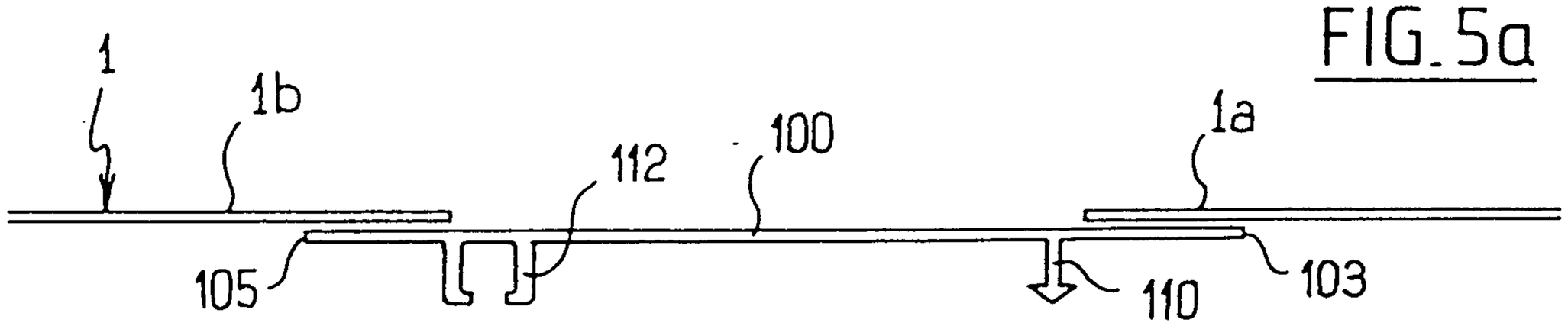

FIG_5b

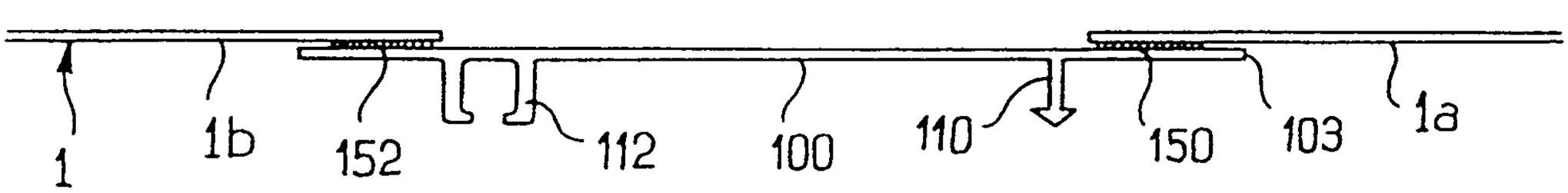

FIG_5c

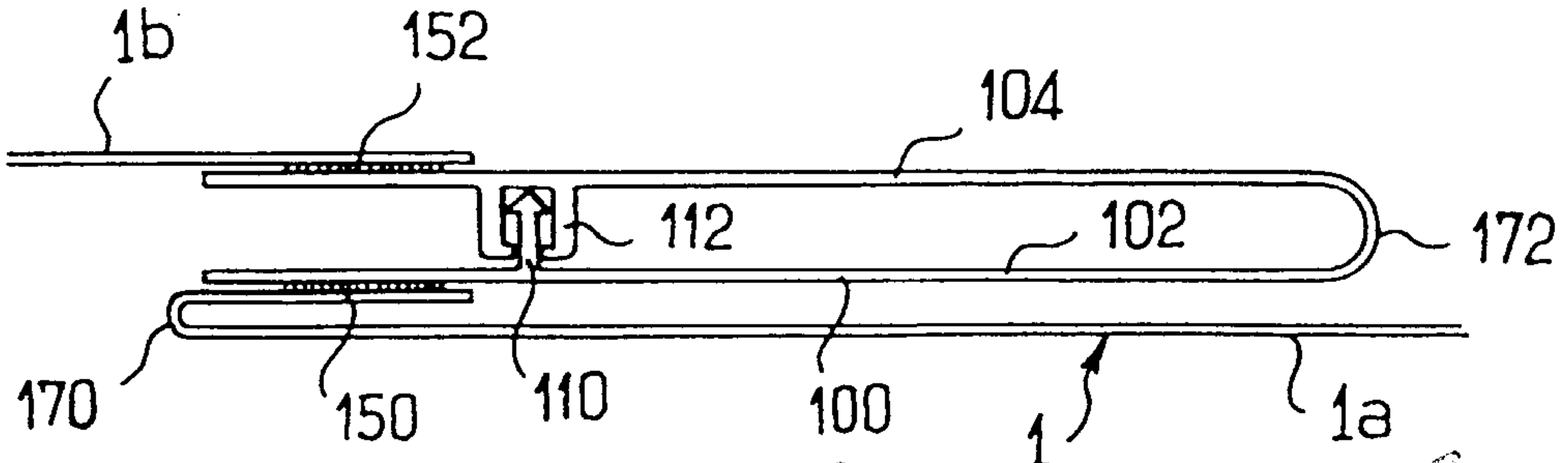

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FIG_6

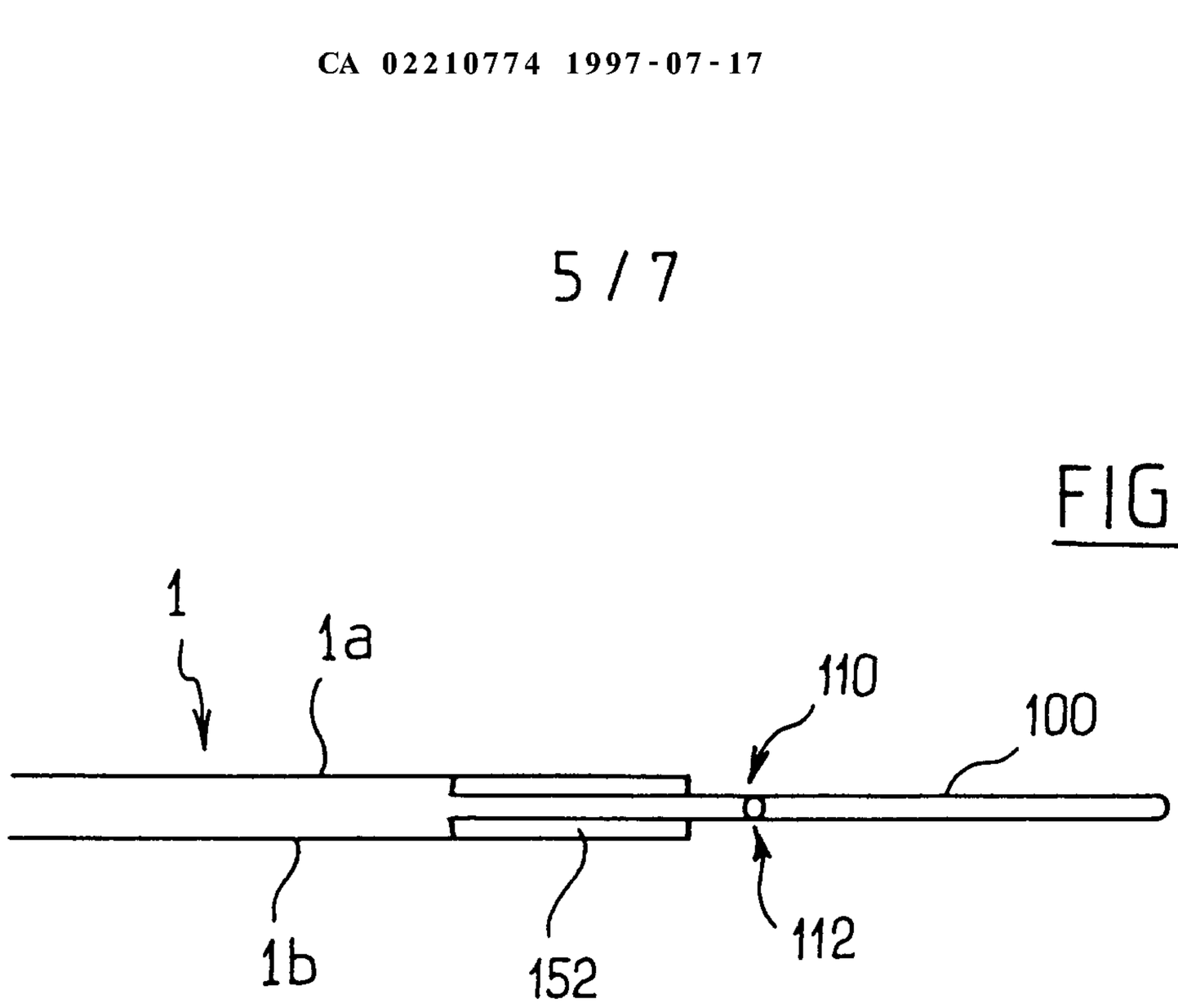


FIG_7

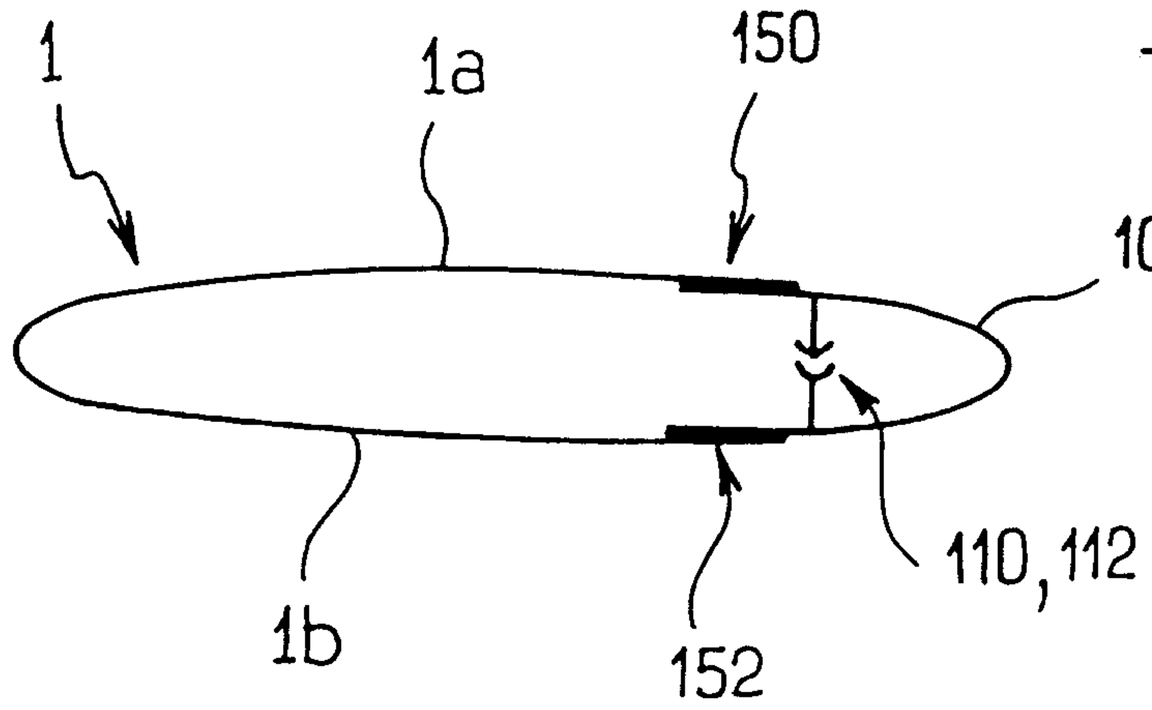
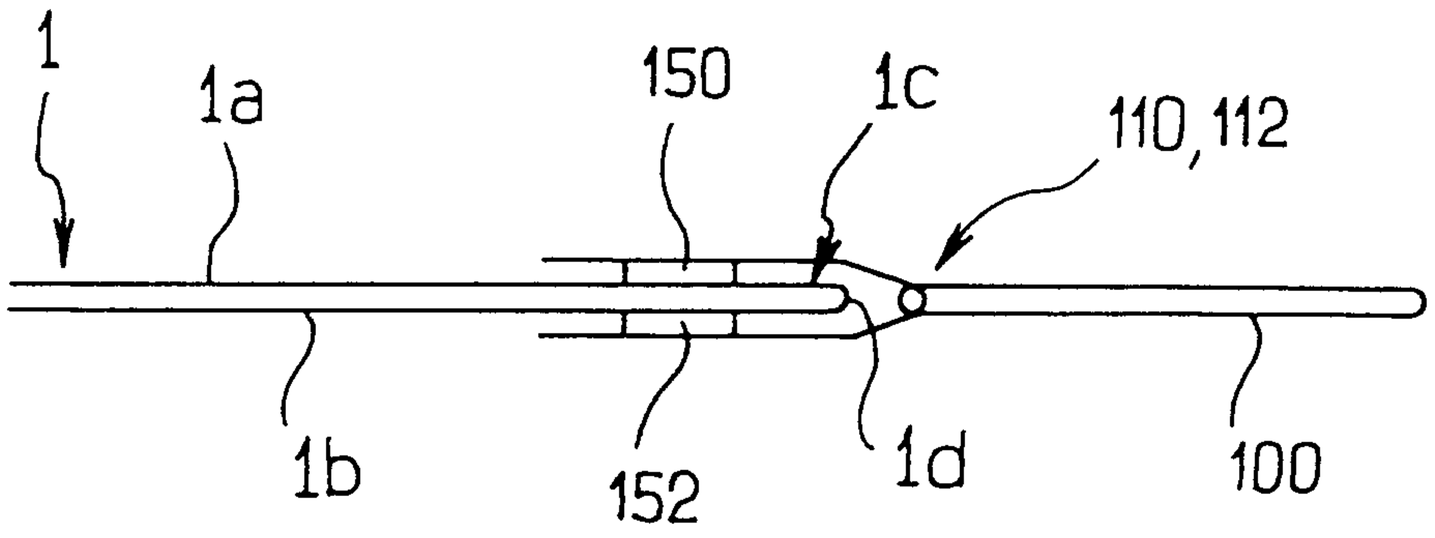


FIG_8



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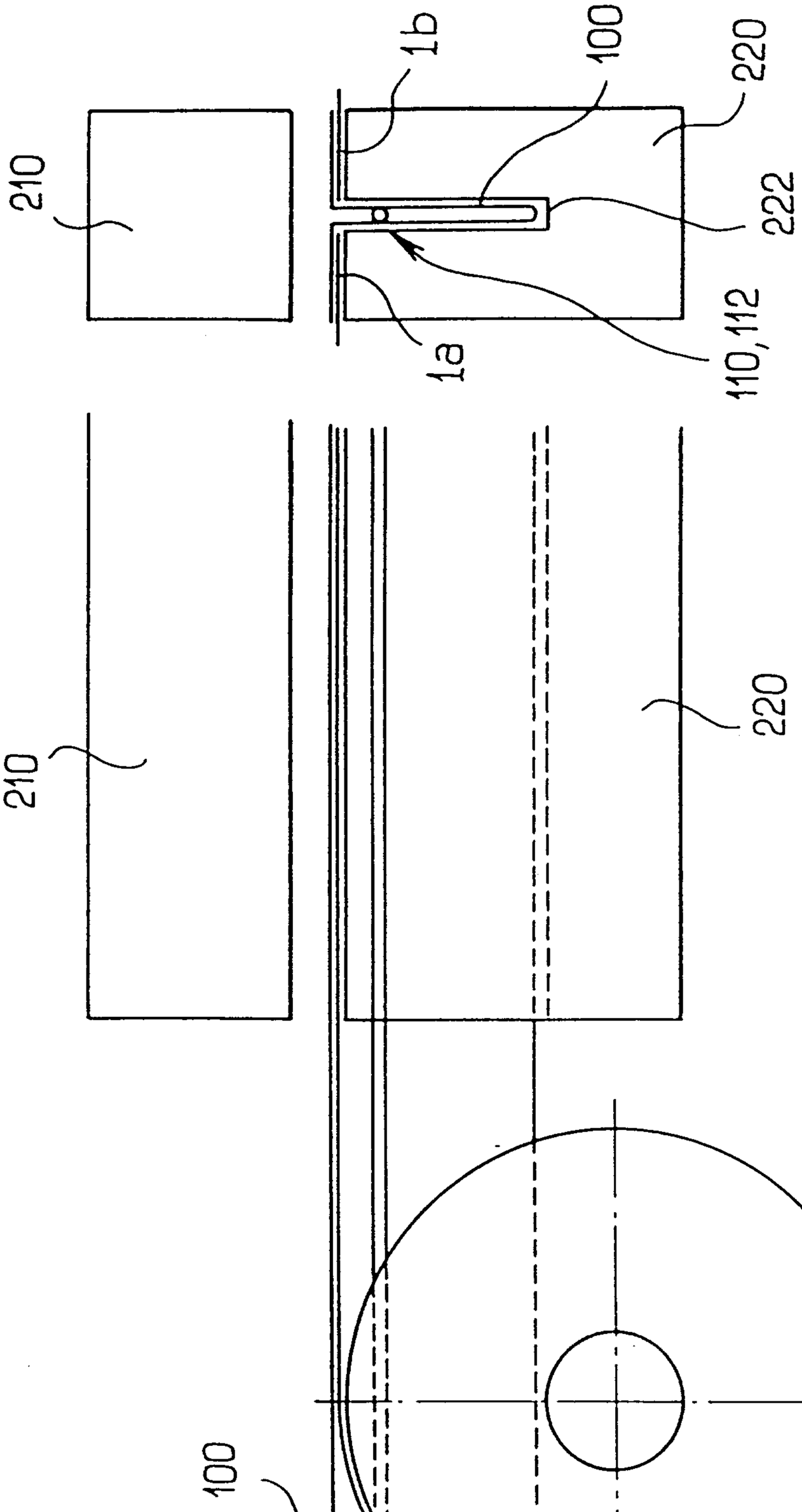

FIG_10

FIG_9

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FIG_12

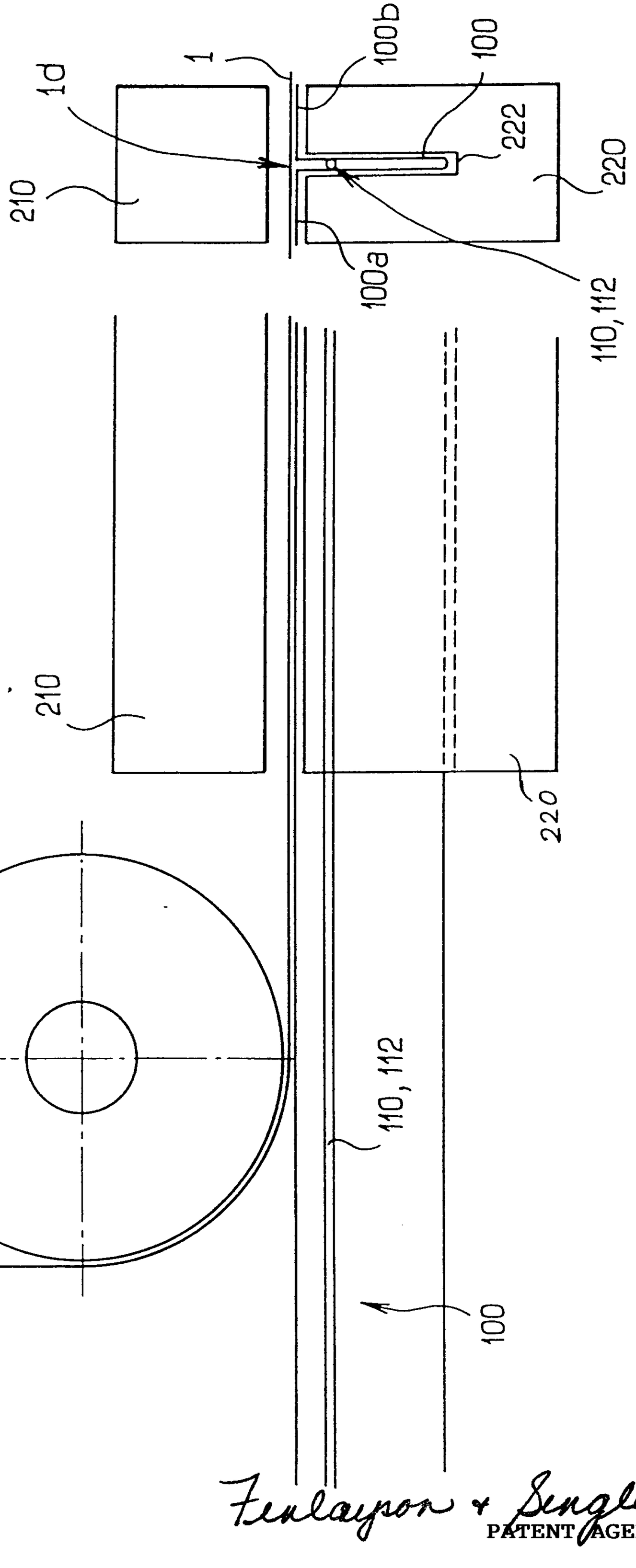

FIG_11

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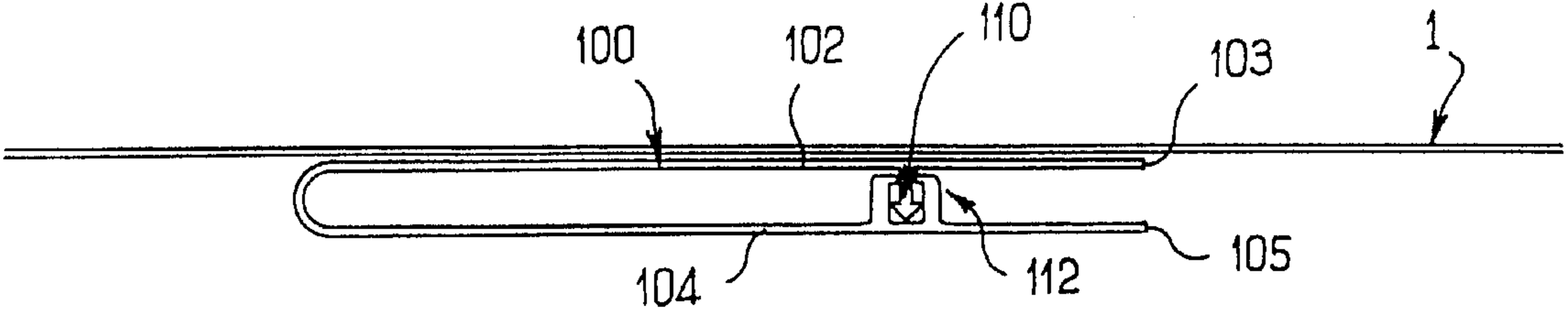
100
102
110
103
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104
112
105