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(54) **PACKAGE**

(57) A package (1000) is presented comprising a bag (100) of flexible material and a folded element (200) placed outside the bag (100), wherein the package further comprises a container (300), for example an envelope, interposed between the bag (100) and the folded element (200). A method for making such a package is also presented.

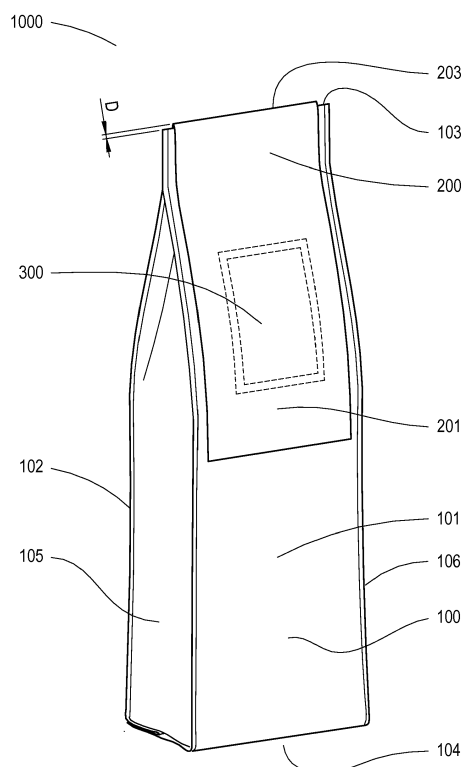


Fig. 3

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Description

TECHNICAL FIELD

5 **[0001]** The present invention relates to the field of packages, for example packages for food products, such as flour or the like. More particularly, the present invention relates to the field of packages comprising a bag of flexible material and an element folded along a folding line and placed outside the bag, for example to report information on the product contained in the packages.

10 BACKGROUND

[0002] Various packages of flexible material are known on the market, for example packages for food products such as flour, mixes for pizza, mixes for desserts, sugar and so on. These packages generally comprise a bag of flexible material with a flat bottom that allows the package to stand upright when resting on the flat bottom, and an upper end opposite to the flat bottom. The upper end can for example correspond to a sealed area so as to close the package. The upper end can also define the opening of the package. The bag of flexible material generally comprises a first face, i.e. a front face, a second face, i.e. a back face, opposite to the first face, and right and left side faces that connect the first face to the second face.

[0003] It is also known to supply these packages with an element folded along a folding line and placed outside the bag, above the upper end of the bag. The folded element is divided by the folding line into a first portion and a second portion. The folded element is placed on the bag so that the folding line is parallel to the upper end of the bag and so that the first portion of the folded element extends along the first face of the bag and the second portion extends along the second face.

[0004] In Italy, this folded element is also known as the "cavaliere", or knight, since from a side view of the package, the first portion and the second portion divided by the folding line can schematically represent the legs of a knight straddling the bag. In German this element can be called "Kartonreiter", see for example DE 38 32 275 A1, or "Kartonstreifen". In English it can be called "cardboard strip".

[0005] This element is particularly advantageous because it allows reporting information on the product contained in the packaging to which it is applied, for example information on the manufacturer of the product contained therein, on the ingredients of the product contained therein, the expiry date and so on. Furthermore, it is possible to display captivating images, trademarks or logos on this element to attract consumer attention. Instead of printing this information directly onto the faces of the bag, whose flexible material may not be a good support for printing, it is possible to print it easily and effectively on this folded element which is generally made of paper, card or cardboard, and is then applied to the bag in order to realise the final package.

[0006] Further examples of packages based on the state of the art can be found in DE 79 09 149 U1 and in FR 1 240 458 A.

[0007] Although the packages with the folded element have the advantages mentioned above, the object of the present invention is to optimise and further improve such packages. In particular, the object of the present invention is to provide packages of this type which are even more versatile and functional than the known packages.

40 SUMMARY

[0008] The present invention is based on the idea of providing a further container, for example an envelope, interposed and fixed between the bag of flexible material and the folded element. It is possible to store products inside this container that accompany the main product contained in the bag of flexible material. For example, if flour is contained in the bag of flexible material, it may be advantageous to provide yeast in the additional container. If a mix for desserts is contained in the bag of flexible material, it may be advantageous to provide decorative items for desserts in the additional container. The additional container can also be used for gadgets or in any case for any type of product wished to accompany the product contained in the bag of flexible material but which, for whatever reason, is not initially placed in contact or mixed with the product contained in the bag of flexible material.

[0009] According to one embodiment of the present invention, a package is provided comprising a bag of flexible material comprising a first face and a second face, wherein the package further comprises an element folded along a folding line, wherein the folding line is parallel to the upper end of the bag and divides the folded element into a first portion and a second portion so that the first portion extends along the first face and the second portion extends along the second face, wherein the package further comprises a container interposed between the package and the folded element, for example between the first portion and the first face. The bag can be made of any type of flexible material, for example a material compatible with food products. The first face can be the front face of the bag, i.e. the face that possibly shows the main information on the contents of the bag such as the manufacturer's logo, the name of the product

or the like. The second face can be the back face of the bag, i.e. the face that generally shows further information such as the ingredients of the bag's contents, the nutritional values, the expiry date and so on.

[0010] According to the present invention, the bag could also not present any information or words and all this information could be reported on the folded element. The bag could be closed, for example sealed, in order to avoid the accidental spillage of the product. Furthermore, the bag could be configured to preserve the organoleptic properties of the product contained therein. The bag could be sealed at its upper end. The folded element according to the present invention is generally indicated in English as a "cardboard strip". The folded element can be made of any material suitable for being folded. For example, the folded element can be made of paper, card or cardboard. The first portion of the folded element can report the main information on the contents of the bag, for example the manufacturer's logo, the name of the product, one or more figures representing the product contained therein or that which can be achieved with the product contained therein or so on. The second portion of the folded element can report further information such as the ingredients of the contents of the bag, the nutritional values, the expiry date and so on. The length of the first portion along the first face of the bag could be equal to the length of the second portion along the second face of the bag. In this case, the folded element is symmetrical. Alternatively, one of the two lengths could be greater than the other and thus give the folded element an asymmetrical configuration. The container interposed between the bag and the folded element can be advantageously used to contain any type of product wished to accompany the product contained in the bag but which, for whatever reason, is not placed in direct contact with the product contained in the bag within the package.

[0011] According to a further embodiment of the present invention, a package is provided wherein the container is an envelope. The envelope is particularly advantageous since it has a flattened shape which is particularly suitable to be interposed between the bag and the folded element. The envelope can be made of any type of material, for example material compatible with food products. The envelope can be hermetically sealed to preserve the properties of the product contained therein.

[0012] According to a further embodiment of the present invention, a package is provided wherein the length of the first portion along the first face is greater than the length of the second portion along the second face. This asymmetrical configuration of the folded element is particularly advantageous in the case wherein the container is interposed between the first portion and the first face of the bag, as a larger surface to which the container can be applied is available.

[0013] According to a further embodiment of the present invention, a package is provided wherein the folded element further comprises a through hole, for example a euro hole that allows hanging the package, or one or more openings to be able to grasp the package through the one or more openings. The euro hole can be used to hang the package on store shelves. The one or more openings can be used as a handle to be able to grasp the package.

[0014] According to a further embodiment of the present invention, a package is provided wherein the first portion and/or the second portion is fixed, for example by means of glue, to the first face and/or to the second face, respectively. It is therefore possible to have a configuration wherein only the first portion is fixed to the first face. Alternatively, it is possible to have a configuration wherein only the second portion is fixed to the second face. Furthermore, it is possible to have a configuration wherein both portions of the folded element are fixed to the respective faces of the bag. Fixing by glue is advantageous because it is a stable fixing and, at the same time, it is not visible from the outside of the package. Furthermore, the use of glue allows avoiding fixing by rivets, which are disadvantageous since they are expensive, difficult to apply and can be accidentally swallowed.

[0015] According to a further embodiment of the present invention, a package is provided wherein the container is fixed, for example by means of glue, to the folded element, for example to the first portion of the folded element. Fixing with glue is advantageous because it is stable. Furthermore, fixing the container to the folded element is advantageous since it allows the container to be applied directly to the bag when the folded element is applied.

[0016] According to a further embodiment of the present invention, a package is provided wherein the container is fixed, for example by means of glue, to the first face. This allows the container to be further secured to the system so as to effectively prevent the container from accidentally separating from the package.

[0017] According to a further embodiment of the present invention, a package is provided wherein the container is interposed between the first portion and the first face, the container is fixed, for example by means of glue, to the first portion and the first portion is further fixed, for example by means of glue, to the first face. This allows further optimising the fixing of the container to the packaging. The fixing of the first portion to the first face can advantageously take place below the container so that the container is enclosed in the space defined in the vertical direction between the folding line of the folded element and the fixing point between the first portion and the first face of the bag. In this way the accidental detachment of the container from the package is effectively prevented, for example during the transport steps of the package.

[0018] According to a further embodiment of the present invention, a package is provided wherein the folded element is fixed to the package by one or more rivets. Even if the rivets could increase the costs of the system and could be accidentally swallowed, the package with rivets could still be desired for aesthetic purposes, for example because the rivets evoke a fixing method of past times or in any case fixing carried out in a manual manner.

[0019] According to a further embodiment of the present invention, a package is provided wherein the bag further

comprises a flat bottom so that the package can stand upright resting on the flat bottom.

[0020] According to a further embodiment of the present invention, a method is provided for making a package of flexible material comprising the following steps:

- 5 a) providing a bag of flexible material that is filled and sealed and comprising a first face and a second face;
- b) providing an element folded along a folding line so that the folded element is divided into a first portion and a second portion separated by the folding line;
- 10 c) applying the folded element to the bag so that the first portion extends along the first face and the second portion extends along the second face;

wherein the method further comprises the following step:

- d) interposing a container, for example an envelope, between the bag and the folded element.
- 15 **[0021]** The bag can for example be provided by a machine known from the state of the art for making, filling and closing bags of flexible material.
- [0022]** According to a further embodiment of the present invention, a method is provided, wherein step b) comprises the following sub-steps realised in the order in which they are listed:

- 20 b1) providing a foldable flat element;
- b2) fixing a container to the foldable flat element, for example by means of glue;
- b3) folding the foldable flat element along the folding line so that the container is fixed exclusively to the first portion and extends exclusively along the first portion so that, when the folded element is applied to the bag in step c), the container is interposed between the first portion and the first face.

[0023] This method is particularly advantageous since fixing the container to a flat element is particularly simple. In this way the container is automatically fixed to the package in an easy way when the folded element is fixed to the package.

- 30 **[0024]** According to a further embodiment of the present invention, a method is provided wherein step b3) and step c) are carried out simultaneously. Folding and fixing the folded element to the bag at the same time is particularly advantageous because the production times of the package are accelerated and everything can be done in a reduced amount of space.

- 35 **[0025]** According to a further embodiment of the present invention, a method is provided wherein step b1) comprises the following sub-step:

b11) applying glue to a surface of the foldable flat element so that a first part of the applied glue can be used to perform step b2) and, following step b3), a second part of the applied glue is in the second portion so as to be able to fix the second portion to the second face and a third part of the applied glue is in the first portion so as to be able to fix the first portion to the first face.

- 40 **[0026]** This embodiment is particularly advantageous because with the sole application of glue to the flat element as defined in step b11), all the desired portions of glue are obtained to firmly fix both the container and the folded element to the bag. This allows speeding up and further simplifying the formation of the package and, at the same time, obtaining a stable package. The glue applied in step b11) can be applied using a single glue applicator that applies the three parts of glue at different times.

- 45 **[0027]** According to a further embodiment of the present invention, a method is provided wherein step a) comprises the following sub-step:

a1) applying glue to the first face and/or to the second face so that following step c), the first portion is fixed to the first face by at least a first portion of the glue and/or the second portion is fixed to the second face by means of at least a second portion of the glue.

- 50 **[0028]** In this embodiment, the glue for fixing the folded element to the bag is applied directly to the bag. The glue for fixing the container can instead be applied to the foldable flat element. This embodiment provides two distinct glue application stations, one station for applying glue to the bag and one for applying glue to the foldable flat element. This makes it possible to speed up the process because these glue applications taking place in separate stations can occur simultaneously, since one station operates on the bag and the other on the foldable flat element before they are placed in contact.

BRIEF DESCRIPTION OF THE DRAWINGS

[0029] The present invention is described with reference to the accompanying drawings in which the same reference numbers and/or marks indicate the same parts and/or similar parts and/or corresponding parts of the system.

Figure 1 schematically shows a bag that can be used to realise a package according to an embodiment of the present invention;

Figure 2 schematically shows a side view of the bag of figure 1;

Figure 3 schematically shows a package according to an embodiment of the present invention;

Figure 4 schematically shows a side view of a package according to a further embodiment of the present invention;

Figure 5 schematically shows a side view of a package according to a further embodiment of the present invention;

Figure 6 schematically shows a side view of a package according to a further embodiment of the present invention;

Figure 7 schematically shows a side view of a package according to a further embodiment of the present invention;

Figure 8 schematically shows a side view of a package according to a further embodiment of the present invention;

Figure 9 schematically shows a side view of a package according to a further embodiment of the present invention;

Figure 10 schematically shows a side view of a package according to a further embodiment of the present invention;

Figure 11 schematically shows a package according to a further embodiment of the present invention;

Figure 12 schematically shows a package according to a further embodiment of the present invention;

Figure 13 schematically shows a step of a method according to an embodiment of the present invention;

Figure 14 schematically shows a further step of a method according to an embodiment of the present invention;

Figure 15 schematically shows a further step of a method according to an embodiment of the present invention;

Figure 16 schematically shows a system for carrying out a method according to an embodiment of the present invention;

Figure 17 schematically shows a detail of the system of figure 16 during an execution step of a method according to an embodiment of the present invention;

Figure 18 schematically shows a detail of the system of figure 16 during an execution step of a method according to an embodiment of the present invention;

Figure 19 schematically shows the system of figure 16 during an execution step of a method according to an embodiment of the present invention;

Figure 20 schematically shows the system of figure 16 during a further execution step of a method according to an embodiment of the present invention;

Figure 21 schematically shows the system of figure 16 during a further execution step of a method according to an embodiment of the present invention;

Figure 22 schematically shows the system of figure 16 during a further execution step of a method according to an embodiment of the present invention;

Figure 23 schematically shows the system of figure 16 during a further execution step of a method according to an

embodiment of the present invention.

DETAILED DESCRIPTION

[0030] The present invention is described hereinbelow by making reference to particular embodiments, as illustrated in the accompanying drawings. However, the present invention is not limited to the particular embodiments described in the following detailed description and depicted in the drawings, rather the embodiments described simply exemplify the various aspects of the present invention, the scope of which is defined by the claims. Further modifications and variations of the present invention will be apparent to those skilled in art.

[0031] Figure 1 schematically shows a bag 100 that can be used to realise a package according to an embodiment of the present invention. The bag 100 is made of flexible material, for example material compatible with food products that can be stored in the bag 100.

[0032] The bag 100 comprises a first face 101, in the front in the figure, and a second face 102 opposite to the first face 101 and therefore in the back in the figure. The bag 100 also comprises a flat bottom 104 that allows the bag to stand upright resting on the flat bottom 104. The bag also comprises an upper end 103 opposite the flat bottom 104. The upper end 103 is also the upper end of a sealed area that closes the bag 100. In practice, the first face 101 and the second face 102 meet and are adjacent to the upper end 103 in such a way that the bag is closed. The bag then comprises a left side face 105 and a right side face 106. The side faces 105 and 106 laterally connect the first face 101 to the second face 102.

[0033] The bag 100 can be of various sizes. For example, the bag 100 could be a bag to hold 1 kg of flour or sugar. Within the scope of the present invention, however, the bag 100 can also be much smaller or much larger.

[0034] Figure 2 shows a side view of the bag 100 of figure 1. This view shows the front of the left side face 105 which is delimited at the sides by the first face 101 and by the second face 102.

[0035] Figure 3 shows a package 1000 according to one embodiment of the present invention. In particular, the package 1000 comprises a bag 100 such as that shown in figure 1, a folded element 200 and a container 300, for example an envelope, interposed between the bag 100 and the folded element 200.

[0036] The folded element 200 (also called "cardboard strip" in English) is folded along the folding line 203 which is parallel to the upper end 103 of the bag 100. In particular, as shown in the figure, there is a distance D between the folding line 203 and the upper end 103. This distance can be chosen at will and can also be substantially eliminated as shown in figure 3.

[0037] The folding line 203 divides the folded element 200 into a first portion 201, visible in the figure, and a second portion 202 placed in the back of the package and therefore not visible in the figure (see, for example, figure 4). The first portion 201 extends along the first face 101 of the bag 100. The second portion 202 extends along the second face 102.

[0038] The container 300 is interposed between the first portion 201 and the first face 101. In particular, the container 300 is shown with a dashed line in figure 3 since it is located below the first portion 201. However, the container 300 is outside the bag 100.

[0039] Figure 4 shows a side view of the bag of figure 3. The two portions 201 and 202 of the folded element 200 identified by the folding line 203 can be noted. Note also that the length of the first portion 201 along the first face 101 is greater than the length of the second portion 202 along the second face 102. In this way, space is created for housing the container 300 between the first portion 201 and the first face 101.

[0040] The container 300 is interposed between the first portion 201 and the first face 101. The container 300 is therefore below the folded element 200 but outside the bag 100.

[0041] Figure 4 also shows that the folded element 200 is fixed to the bag 100 by means of glue. In particular, the second portion 202 of the folded element 200 is fixed to the second face 102 of the bag 100 through the portion of glue 501. The first portion 201 of the folded element 200 is fixed to the first face 101 of the bag through the portion of glue 502 which is above the container 300, i.e. between the package 300 and the upper end 103 of the bag 100. Finally, it can be observed that the container 300 is fixed to the first portion 201 by means of the portion of glue 503.

[0042] Figure 5 shows an alternative embodiment. In this case, the fixing of the first portion 201 of the folded element 200 to the first face 101 of the bag is achieved by means of the container 300 itself. In particular, as in the case of figure 4, the container 300 is fixed to the first portion 201 through the portion of glue 503. However, unlike figure 4, the portion of glue 501 is not present but the portion of glue 504 with which the container 300 is fixed to the first face 101 is present.

[0043] In the embodiment of figure 6, in addition to fixing with the portions of glue 501, 503 and 504 as in figure 5, there is also the portion of glue 501 which fixes the first portion 201 directly to the first face 101 and which is located above the package 300, i.e. between the package 300 and the upper end 103 of the bag 100.

[0044] Figure 7 shows a further alternative embodiment. In this case, unlike in figure 4, the fixing of the first portion 201 to the first face 101 does not take place through the portion of glue 501 placed above the container 300 but through the portion of glue 505 placed below the container 300, i.e. between the container 300 and the lower end of the first portion 201.

[0045] Figure 8 shows a further possible variant of the configuration of figure 7 wherein the portion of glue 504 between the container 300 and the first face 101 is added.

[0046] Figure 9 shows a further possible variant of the configuration of figure 7 wherein the portion of glue 502 is added between the container 300 and the first face 101.

[0047] Figure 10 shows a further possible variant wherein all the portions of glue 501, 502, 503, 504 and 505 are present.

[0048] The portions of glue 501, 502, 503, 504, 505 shown in figures 4 to 10 can independently assume any type of desired configuration. One possible configuration for one or more of the portions of glue could be pointed, i.e. in the form of a point or drop of glue. Alternatively, one or more of the portions of glue could be a strip of the desired length of glue. Configurations are also possible wherein one or more of the portions of glue have a multiple configuration, for example different glue points close together or the like.

[0049] Figure 11 shows a further embodiment of the package 1000 wherein the folded element 200 is fixed to the bag 100 by means of rivets 205. The folded element 200 could be fixed to the bag 100 exclusively by means of the rivets 205. Alternatively, the folded element 200 could be fixed to the bag 100 by means of both the rivets 205 and by means of glue. The glue could be arranged as in any of the configurations shown in figures 4 to 10. The container 300 can be fixed to the first portion 201 by means of glue. In particular, the container 300 can be fixed to the package according to any one of the configurations shown in figures 4 to 10.

[0050] Figure 12 shows a further embodiment of the package 1000 according to the present invention. As can be seen in the figure, the package 1000 further comprises the through hole 204, in this case a euro hole to be able to hang the package. The through hole 204 is made exclusively in the folded element 200. In particular, the hole 204 is formed in the first portion 201 and in the second portion 202 of the folded element 200 so as to be a through hole. For this purpose, as seen from the comparison with figure 3, the distance D between the upper end of the bag 103 and the folding line 203 of the folded element 200 is increased so as to have a portion of folded element 200 inside which the bag 100 is not sufficiently large enough to be able to make the through hole 204 without damaging the bag 100. This configuration is particularly advantageous because it allows having the package 1000 with the through hole 204 without however affecting the bag 100 and thus reducing the chances that the bag 100 accidentally opens, is damaged or that the product inside it accidentally comes into contact with the environment outside the bag 100.

[0051] Also in this embodiment the container 300 is interposed between the first portion 201 of the folded element 200 and the first face 101 of the bag 100. The container 300 can be fixed by means of glue. In particular, the container 300 can be fixed according to any one of the configurations shown in figures 4 to 10.

[0052] The folded element 200 of the embodiment of figure 12 can also be fixed to the bag 100 according to any one of the configurations shown in figures 4 to 10.

[0053] Moreover, the folded element 200 with the through hole 204 could be fixed to the bag 100 by means of rivets, in a manner similar to that described with reference to figure 11.

[0054] Alternatively and/or in addition to the euro hole similar to that shown with the reference number 204 in figure 12, the folded element 200 could comprise further through holes, for example through holes which form a handle to be able to grasp the package 1000 through these through holes. Also in this case it is particularly advantageous that the through holes are made exclusively in the folded element 200 without affecting the bag 100. To do this, it is necessary to choose the appropriate distance D between the upper end 103 of the bag 100 and the folding line 203 so that the folded element 200 has sufficient space above the upper end 103 of the bag 100 to be able to make the desired through holes in this space.

[0055] According to the present invention, a method is also provided for making a package comprising a bag of flexible material, a folded element and a container, for example an envelope, interposed between the bag and the folded element.

[0056] Figures 13, 14 and 15 schematically show some steps of a method according to one embodiment of the present invention.

[0057] Figure 13 shows a foldable flat element 200'. This element can be made for example of paper, card or cardboard.

[0058] Figure 14 shows a container 300 that is applied to the lower surface of the foldable flat element 200'. In particular, the container 300 is fixed to the lower surface of the foldable flat element 200' by means of glue 503.

[0059] Figure 15 shows the foldable flat element 200' with the container 300 applied that is folded along the folding line 203 so as to be divided into the two portions 201 and 202. The container 300 is entirely comprised in the portion 201.

[0060] Figures 16 to 23 show a system for carrying out the method according to the embodiments of the present invention.

[0061] The system 1 shown in figure 16 can be used to make a package 1000 such as that shown in figures 3 to 12.

[0062] The system 1 comprises a storage 11 able to house a plurality of foldable flat elements, in particular adapted to house a stack of such foldable flat elements. The foldable flat elements are the elements with which the folded element 200 is made. Such elements can therefore be, for example, sheets of paper, card or cardboard. These elements can be rectangular. The storage 11 can be adapted to house flat elements of different sizes. For example, the storage 11 can have movable side walls so as to be able to define different housings of different sizes in order to be able to house stacks of foldable elements of different sizes.

[0063] The system 1 further comprises gripping means for extracting one of the foldable flat elements housed in the storage 11 and bringing it to a predetermined position. In particular, in the example shown in the figure, the gripping means comprise a first gripping element 12a and a second gripping element 12b. The first gripping element 12a is a suction cup placed below the storage 11. The suction cup 12a is movable in a vertical direction so as to be able to contact the lower foldable element of the stack of foldable elements housed in the storage 11. In this way, by means of the suction cup 12a it is possible to extract from the stack at least a portion of the lower foldable element of the stack. In particular, it is possible to detach at least one edge of the lower foldable element of the stack so as to be able to grasp this edge by means of the second gripping element 12b. In the example shown in the figure the second gripping element 12b comprises a gripper. The gripping element 12b is movable both in the vertical direction and in the horizontal direction. The movement in the horizontal direction allows the foldable element to be completely withdrawn from the stack housed in the storage 11. The movement in the vertical direction allows adjusting the height of the foldable element within the system 1. In this way, the action of the first gripping element 12a and of the second gripping element 12b allows bringing the foldable element into a predetermined position within the system 1.

[0064] The system 1 further comprises a supporting and folding element 13. In the example shown in the figure, this element comprises a flat bar 13a placed so that the side of the thickness of the bar faces upwards. The supporting and folding element 13 is placed so that it can be brought into contact with the foldable flat element placed in the predetermined position by the gripping means 12.

[0065] The system 1 also comprises folding means 14 for folding the flat element around the supporting and folding element 13. In the example shown in the figure, the folding means 14 comprise a series of rollers that can be moved in a vertical direction.

[0066] The system 1 further comprises the housings 15 for housing the bags to which the folded element 200 is to be applied. The housings 15 are movable. For example, the housings 15 can be placed on a conveyor belt, for example a looped conveyor belt, so as to be able to move the bags to which the folded element 200 is to be applied. Each of the bags can then be brought into a position at the supporting and folding element 13 so that when the foldable flat element is folded around the supporting and folding element 13 by the folding means 14, the folded element 200 thus obtained is also fixed to the bag.

[0067] The filled and resealed bags 100 can be supplied by a forming and filling machine known from the state of the art. The bags exiting this machine can be supplied in the housings 15 of the system 1. For example, the forming and filling machine can be coupled to the system 1 so that the filled and sealed bags exiting the forming and filling machine are fed into the housings 15 of the system 1.

[0068] Figure 16 also shows that the system 1 can comprise glue application means, for example one or more glue applicators 17a, 17b and 17c, such as glue guns or the like.

[0069] Furthermore, figure 16 shows that the system 1 comprises a conveyor belt 19 with housings 19a to house the containers 300 to be applied to the packages. In particular, as schematically shown in figure 14, the containers 300 are applied to the foldable flat elements 200' before they are folded and applied to the bags 100. The conveyor belt 19 is therefore below the storage 11.

[0070] Figure 17 schematically shows a detail of the system 1 in a step of the manufacturing process of a package. In particular, figure 17 shows in detail the storage 11 which has been filled with a stack of foldable flat elements 200'. As shown in the figure, the foldable flat elements 200' stacked in the storage 11 comprise a folding line 203. This line can thus be made on the foldable flat elements 200' before stacking them in the storage 11. The folding line could for example be a dotted line or a compressed and therefore easily foldable area of the foldable flat elements 200'. The presence of this folding line 203 makes it possible to facilitate subsequent operations. However, the presence of this line is not necessary and the foldable flat elements 200' may not even be provided. The side walls of the storage 11 can be movable so as to be able to house stacks of foldable flat elements 200' of various sizes and shapes.

[0071] Figure 18 schematically shows a further detail of the system in a further step of the manufacturing process of a package. In particular, the figure shows that the suction cup 12a has contacted the lower side of the lower foldable flat element 200' of the stack and, lowering itself, has detached at least a portion of this foldable flat element 200' from the stack so as to expose its edge so that it can be grasped by the second gripping element 12b.

[0072] Figure 19 schematically shows a further step of the manufacturing process of a package. The second gripping element 12b has gripped the exposed edge of the foldable flat element 200' so as to be able to extract the foldable flat element 200' completely from the stack housed in the storage 11. The figure also shows that some filled and sealed bags 100 are housed and transported in the housings 15. In particular, the first bag 100 has reached a position at the supporting and folding element 13, in particular below the bar 13a. Even more particularly, the upper end 103 of the bag 100 is placed at the bar 13a. As can be seen in figure 16, the side end 13b of the supporting and folding element 13 upstream in the direction of advancement of the bags 100 can act as a guide for the bags 100 by acting on the upper end 103 of the bag. For example, the side end 13b of the supporting and folding element 13 can be slightly inclined so that, following the downstream movement of the bags 100, the upper end 103 of the bags carried by the housings 15 is always on the same side of the bar 13a. Furthermore, figure 16 shows that two opposite glue applicators 17a and 17b

are configured so as to apply glue to both faces 101 and 102 of the bags 100 transported in the housings 15. Alternatively, or in addition, the system can comprise a glue applicator 17c configured to apply glue to the lower surface of the foldable flat element 200' extracted from the storage 11.

[0073] The foldable flat element 200' is placed in a position between the storage 11 and the supporting and folding element 13. In particular, as shown in figure 19, the foldable flat element 200' is transported from the second gripping element 12b to a position outside the storage 11, in particular between the storage 11 and the supporting and folding element 13. The conveyor belt 19 is located below this position. In particular, one of the containers 300 housed on the conveyor belt 19 is located below this position.

[0074] As shown in figure 20, glue 503 is applied to the lower face of the foldable flat element 200'. The glue 503 can be applied by means of the applicator 17c, for example a glue gun or the like. As described above, the applicator 17c can be configured to apply not only the glue 503 to fix the container 300 to the foldable flat element 200', but also to apply additional glue to the foldable flat element 200' so as to be able to fix the folded element 200 obtained by folding the foldable element 200' along the folding line 203 to the bag 100. The glue can be applied while the foldable flat element 200' is removed from the storage 11. Alternatively, the glue can be applied while keeping the foldable flat element 200' stationary between the storage 11 and the position at the supporting and folding element 13.

[0075] Figure 21 shows that a supporting and thrusting element 20, for example a suction cup or a pusher movable in a vertical direction, is used to bring the container 300 from the housing onto the conveyor belt 19 until it comes into contact with the foldable flat element 200'. Advantageously, a counter-thrusting element 21 keeps the foldable flat element 200' fixed against the thrust of the element 20 so as to be able to effectively fix the container 300 to the foldable flat element 200' without undesirably displacing the foldable flat element 200' and/or without damaging the foldable flat element 200'.

[0076] Figure 22 schematically shows a further step of the manufacturing process of a package. The second gripping element 12b has dragged the foldable flat element 200' over the supporting and folding element 13, in particular above the bar 13a. Moreover, it can be seen that the system 1 further comprises locking means 16 for locking the foldable flat element 200' in contact with the supporting and folding element 13. In particular, the locking element 16 comprises a bar which is movable in a vertical direction so as to push the foldable flat element 200' downwards until it contacts the supporting and folding element 13. The lower end of the bar 16 can have a recessed shape so as to be able to better lock the foldable flat element 200' in contact with the supporting and folding element 13.

[0077] Figure 23 schematically shows a further step of the manufacturing process of a package. The folding means 14 are lowered so as to fold the foldable flat element 200' around the supporting and folding element 13 and fix it to the bag 100. In particular, in the example shown in the figure, the folding means 14 comprise two series of rollers that can be moved in a vertical direction so that when they are moved downwards they fold the foldable flat element 200' around the supporting and folding element 13 so as to form the folded element 200. Moreover, the rollers slide along the sides of the folded element 200 so as to make it adhere and then fix it to the bag 100. The fixing of the folded element 200 to the bag 100 can take place by means of the glue applied to the faces 101 and 102 of the bag by the applicators 17a and 17b. Alternatively, the fixing of the folded element 200 to the bag 100 can take place by means of the glue applied to the lower face of the foldable element 200' by means of the applicator 17c configured to apply glue to the lower surface of the foldable flat element 200' when it is extracted from the storage 11. Moreover, the fixing could also take place through the container 300, to whose surface facing the bag glue could be applied by means of the applicator 17c.

[0078] The further movement of the housings 15 allows removing the package 1000 from the supporting and folding element 13.

[0079] The supporting and folding element 13 can be adjustable in height so as to be able to select the desired distance D between the folding line 203 and the upper end 103 of the bag (see figures 1 and 2). Alternatively, or in addition, the housings 15 can also be adjustable in height so as to select the distance D based on the vertical position of the bags 100 housed in the housings 15.

[0080] Through holes such as the hole 204 shown in figure 12 can be made directly on the packages, therefore made as obtained in figure 23. Alternatively, the through holes can be made by providing the foldable flat elements 200' with suitably positioned pairs of holes so that the holes of the pairs fit together when the foldable flat element 200' is folded along the folding line 203. In other words, the foldable flat elements 200' stacked in the storage 11 can already be provided with these pairs of holes wherein the two holes of each pair are suitably positioned in relation to the folding line 203 so that, following the folding along this line, a through hole is obtained.

[0081] Furthermore, the system could further comprise a station for applying rivets 205 to the package so as to fix the folded element to the bag not only by means of glue, but also by means of rivets. This station could be downstream of the station at the supporting and folding element 13.

[0082] Although the present invention was described with reference to the embodiments described above, it is apparent to an expert in the field that it is possible to make several modifications, variants and improvements to the present invention in light of the above teaching and within the scope of the appended claims, without departing from the object and the scope of protection of the invention.

[0083] For example, even if configurations have been shown with only one container 300 interposed between the folded element and the bag, it is possible to realise configurations with more than one container interposed between the folded element and the bag. For example, it is possible to realise configurations with a first container between the first portion of the folded element and the first face of the bag and a second container between the second portion of the folded element and the second face of the bag. It is also possible to realise configurations wherein more than one container, for example two, three or four, are arranged between the first portion of the folded element and the first face of the bag, or between the second portion of the folded element and the second face of the bag, or on both sides.

[0084] The dimensions of the packages and therefore of the relative bags and of the corresponding folded elements can be various, for example to be able to contain from a few grams up to a few kg of product. The dimensions and geometric configurations of the folded element can also be varied. In particular, the portions of the first face and/or the second face of the bag covered by the first portion and/or the second portion, respectively, of the folded element can have various dimensions with both symmetrical and asymmetrical configurations possible.

[0085] Finally, those fields known by experts in the field were not described to avoid excessively and uselessly overshadowing the invention described.

[0086] Accordingly, the invention is not limited to the embodiments described above, but is only limited by the scope of protection of the appended claims.

REFERENCE SIGNS

[0087]

1:	system
11:	storage
12a:	suction cup
12b:	grippers
13:	supporting and folding element
13a:	flat bar
13b:	side end upstream
14:	folding means
15:	housings for bags 100
16:	locking means
17a, 17b, 17c:	glue applicators
19:	container 300 conveyor belt
19a:	container 300 housings
20:	supporting and thrusting element
21:	counter-thrusting element
100:	bag
101:	first face of the bag
102:	second face of the bag
103:	upper end of the bag
104:	flat bottom of the bag
105:	left side face of the bag
106:	right side face of the bag
200:	folded element or "cardboard strip"
201:	first portion of the folded element
202:	second portion of the folded element
203:	folding line
204:	through hole
205:	rivets
200':	foldable flat element
300:	container
501, 502, 503, 504, 505:	portions of glue
1000:	package

Claims

1. A package (1000) comprising a bag (100) of flexible material comprising a first face (101) and a second face (102),

said package (1000) further comprising a folded element (200) folded along a folding line (203), wherein the folding line (203) is parallel to the upper end (103) of the bag (100) and divides the folded element (200) into a first portion (201) and a second portion (202) such that said first portion (201) extends along said first face (101) and said second portion (202) extends along said second face (102), **characterised in that:** said package (100) further comprises a container (300) interposed between said bag (100) and said folded element (200), for example between said first portion (201) and said first face (101).

2. The package according to claim 1, wherein said container (300) is an envelope.

3. The package according to any one of the preceding claims, wherein the length of said first portion (201) along said first face (101) is greater than the length of said second portion (202) along said second face (102).

4. The package according to any one of the preceding claims, wherein said folded element (200) further comprises a through hole (204), for example a euro hole, for hanging said package or one or more openings for grasping said package through said one or more openings.

5. The package according to any one of the preceding claims, wherein said first portion (201) and/or said second portion (202) is fixed, for example by means of glue (501, 502), to said first face (101) and/or said second face (102), respectively.

6. The package according to any one of the preceding claims, wherein said container (300) is fixed, for example by means of glue (503), to said folded element (200), for example to said first portion (201).

7. The package according to any one of the preceding claims, wherein said container (300) is fixed, for example by means of glue (504), to said first face (101).

8. The package according to any one of the preceding claims, wherein said container (300) is interposed between said first portion (201) and said first face (101), said container (300) is fixed, for example by means of glue (503), to said first portion (201) and said first portion (201) is further fixed, for example by means of glue (505), to said first face (101).

9. The package according to any one of the previous claims, wherein said folded element (200) is fixed to said bag (100) by means of one or more rivets (205).

10. The package according to any one of the preceding claims, wherein said bag further comprises a flat bottom (104) so that said package (100) can stand upright resting on said flat bottom (104).

11. A method for realising a package (1000) comprising the following steps:

a) providing a bag (100) of flexible material that is filled and sealed and comprising a first face (101) and a second face (102);

b) providing a folded element (200) folded along a folding line (203) so that the folded element (200) is divided into a first portion (201) and a second portion (202) separated by said folding line (203);

c) applying said folded element (200) to said bag (100) so that said first portion (201) extends along said first face (101) and said second portion (202) extends along said second face (102);

characterised in that:

said method further comprises the following step:

d) interposing a container (300) between said bag (100) and said folded element (200).

12. The method according to claim 11, wherein said step b) comprises the following sub-steps carried out in the order in which they are listed:

b1) providing a foldable flat element (200');

b2) fixing a container (300) to said foldable flat element (200'), for example by means of glue (503);

b3) folding said foldable flat element (200') along said folding line (203) so that said container (300) is fixed exclusively to said first portion (201) and extends exclusively along said first portion (201) so that, when said folded element (200) is applied to said bag (100) in said step c) said container (300) is interposed between said first portion (201) and said first face (101).

13. The method according to claim 12, wherein said sub-step b3) and said step c) are carried out simultaneously.

14. The method according to one of claims 12 or 13, wherein said sub-step b1) comprises the following sub-step:
b11) applying glue to a surface of said foldable flat element (200') so that a first part of the applied glue (503) can
be used to perform step b2) and, following step b3), a second part of the applied glue (501) is in said second portion
(202) so as to be able to fix said second portion (202) to said second face (102) and a third part of the applied glue
(502, 505) is in said first portion (201) so as to be able to fix said first portion (201) to said first face (101).

15. The method according to one of claims 11 to 14, wherein said step a) comprises the following sub-step:
a1) applying glue (501, 502) to said first face (101) and/or to said second face (102) so that following step c), said
first portion (201) is fixed to said first face (101) by means of at least a first portion of said glue (502) and/or said
second portion (202) is fixed to said second face (102) by means of at least a second portion of said glue (501),
respectively.

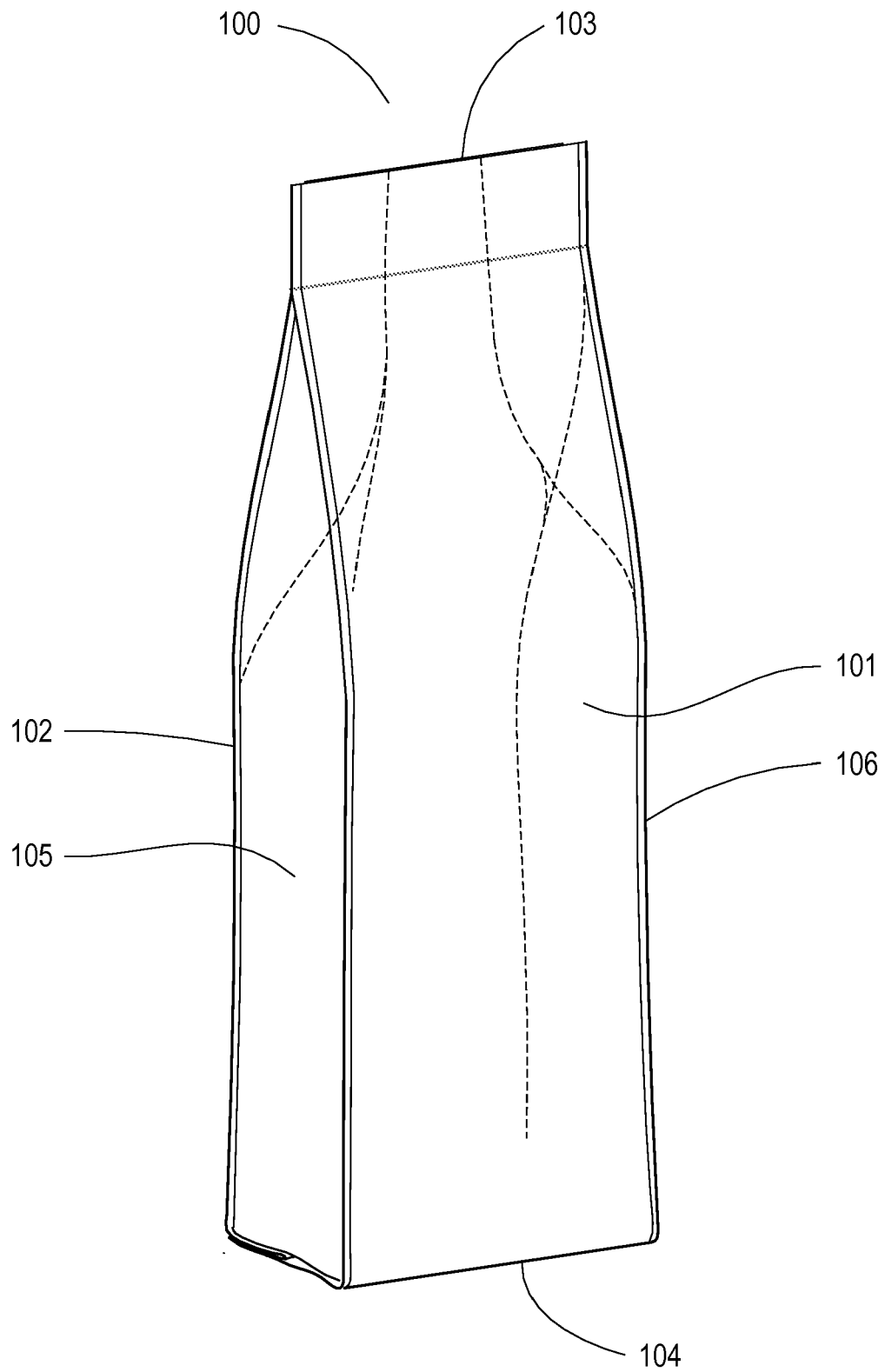


Fig. 1

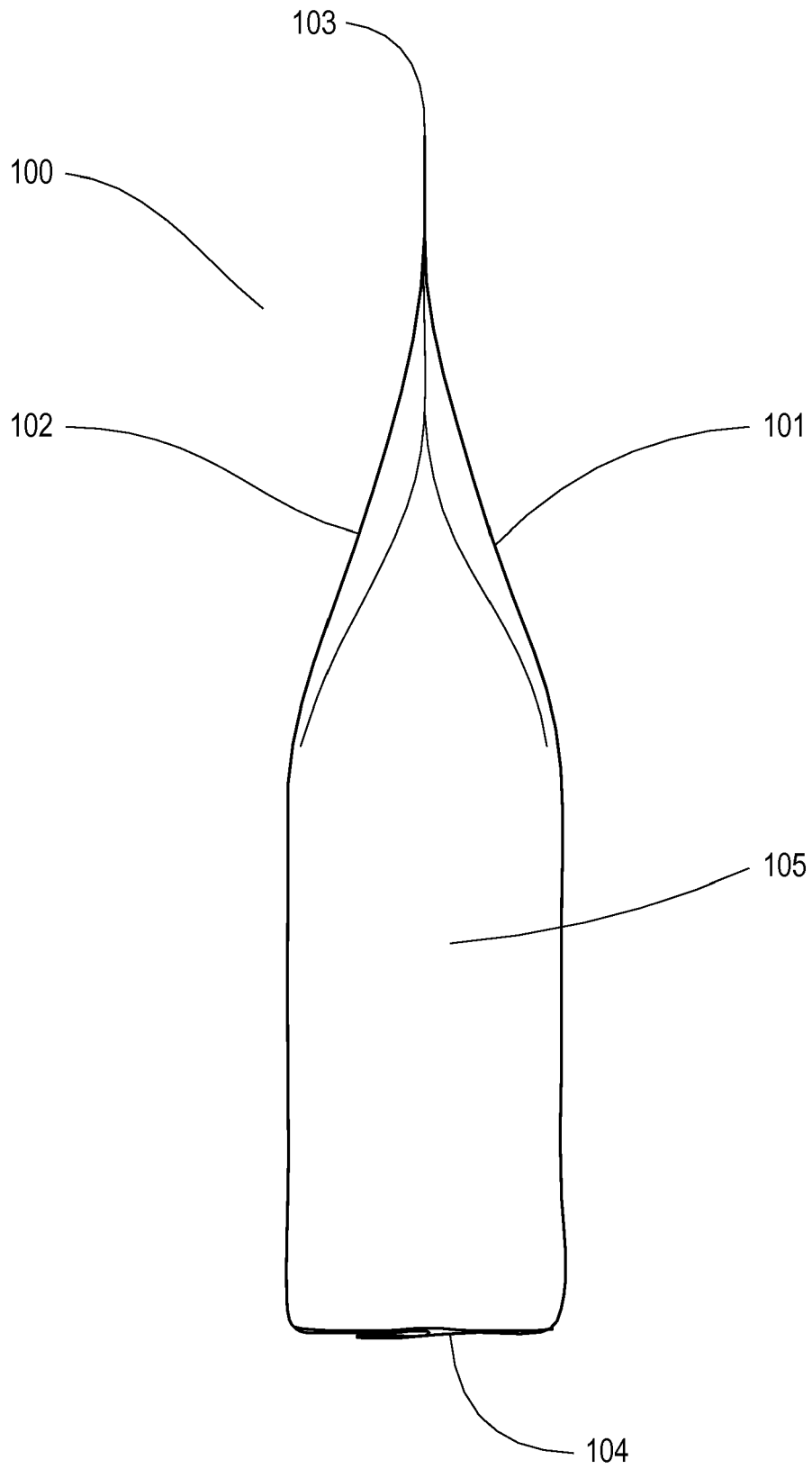


Fig. 2

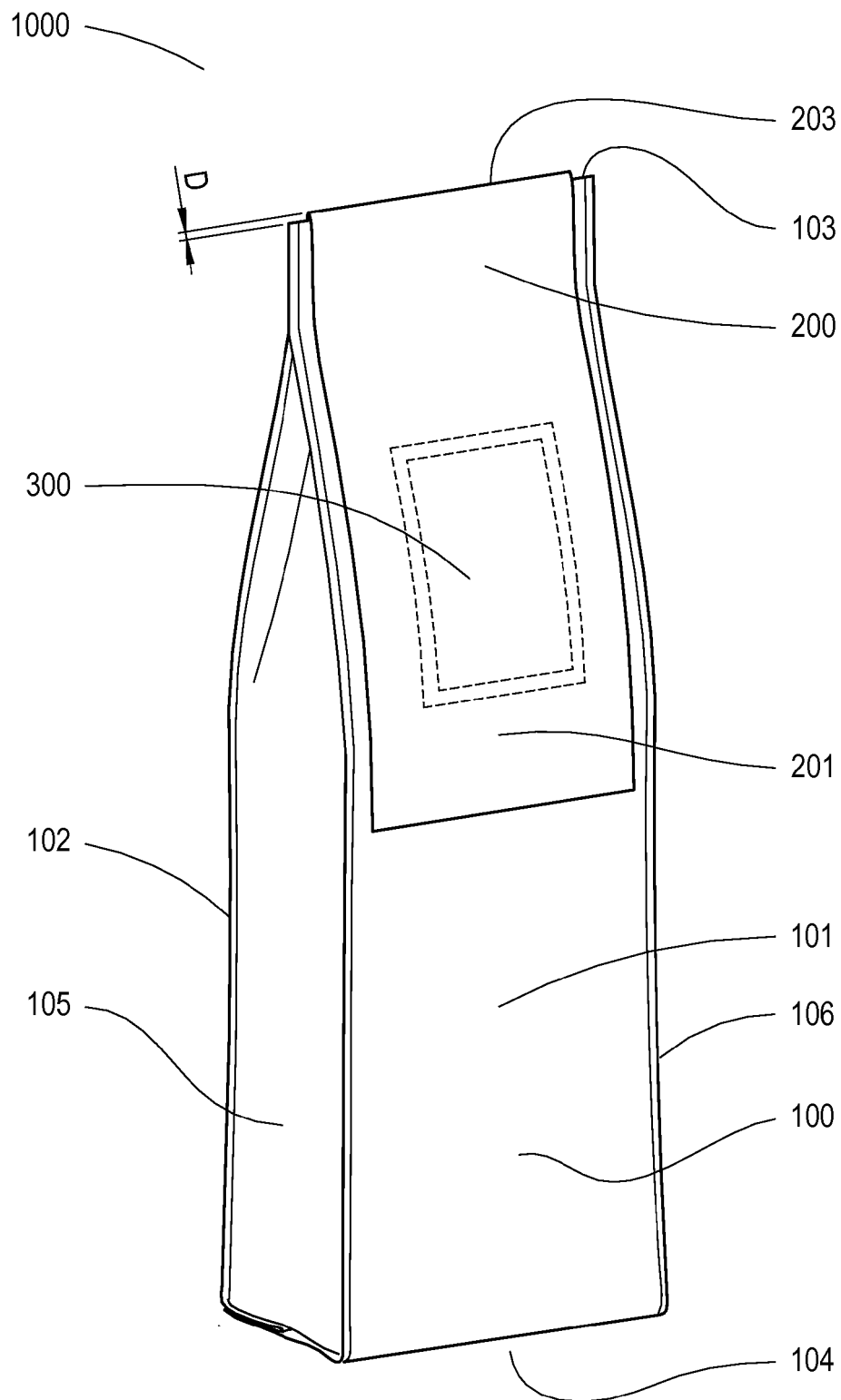


Fig. 3

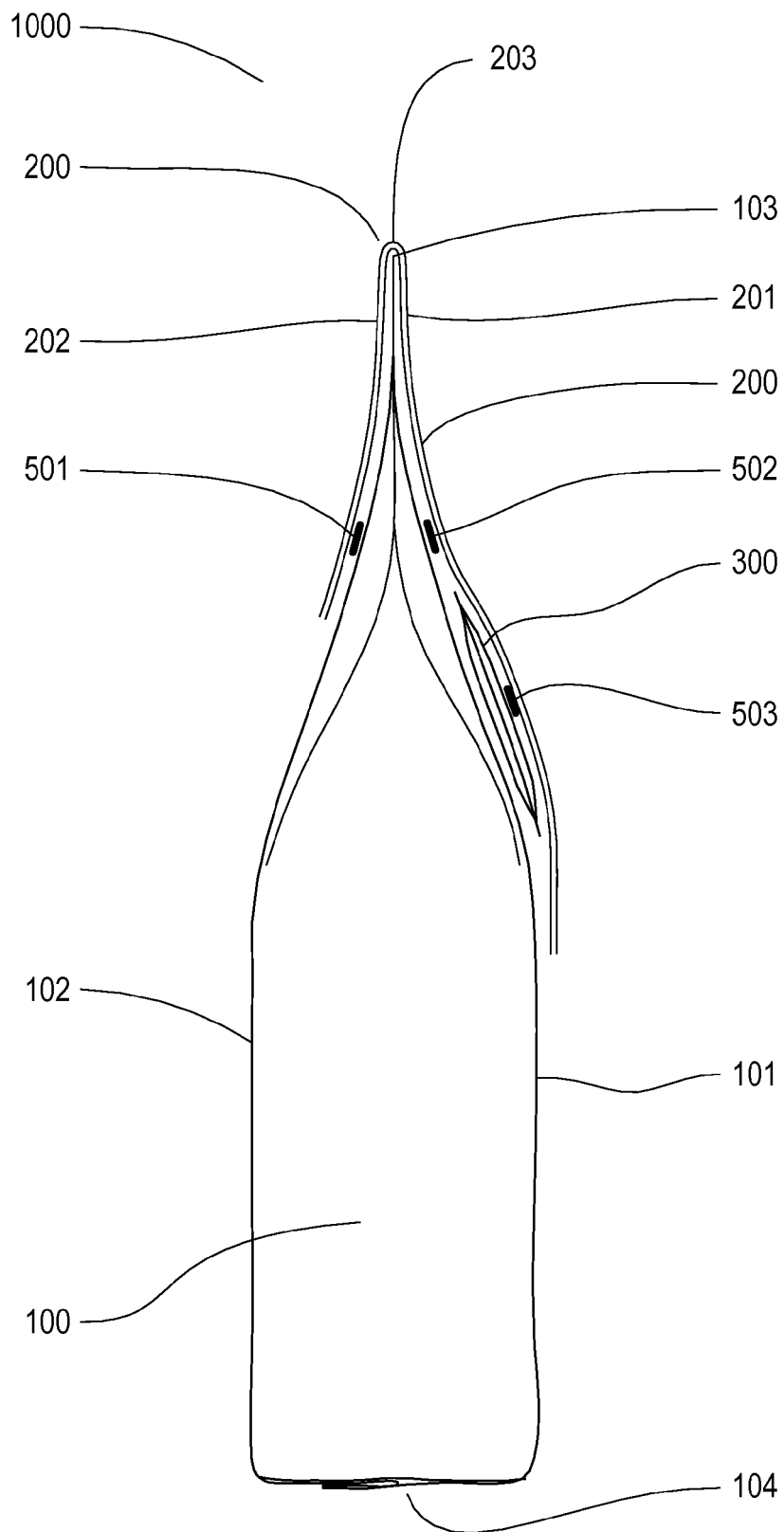


Fig. 4

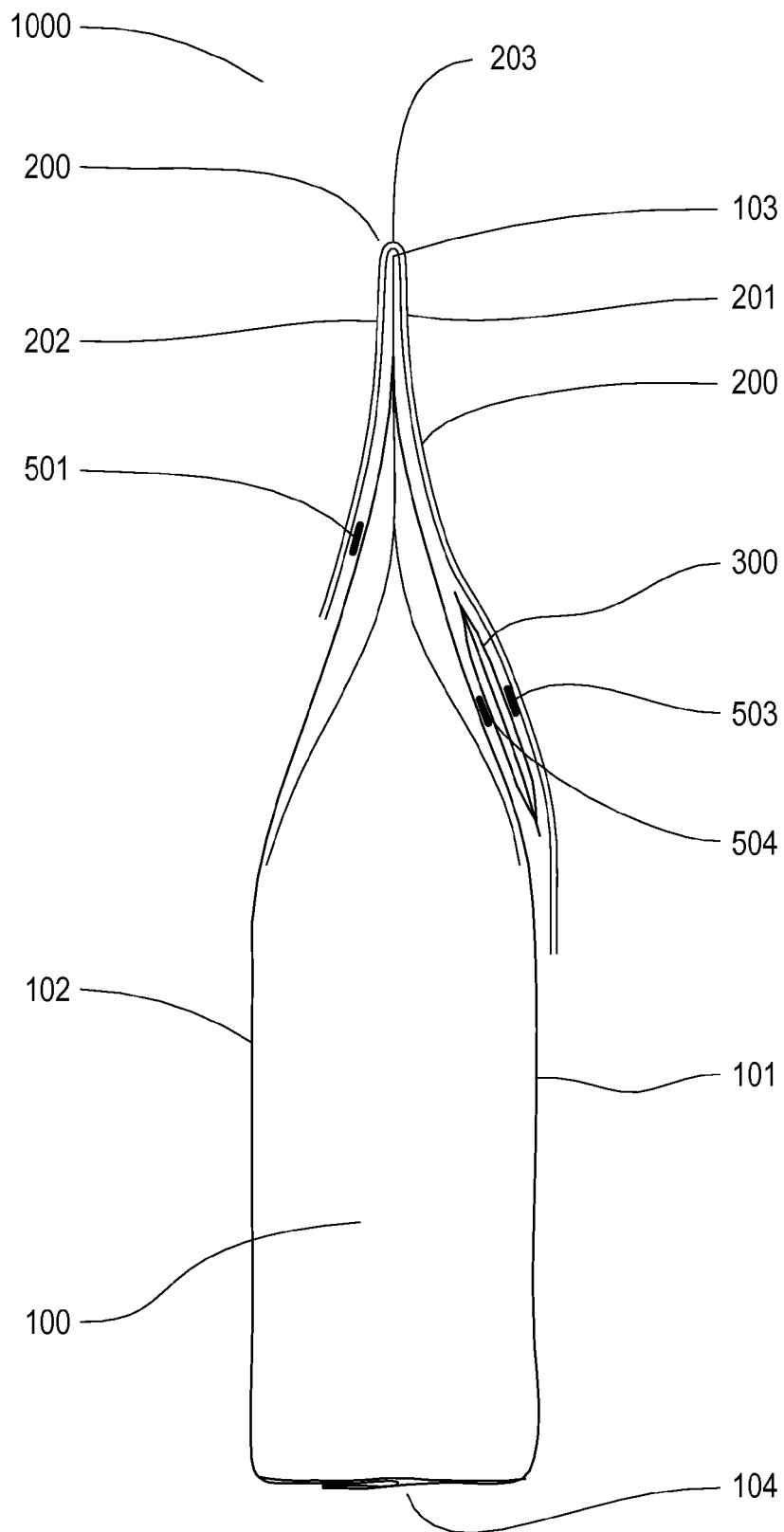


Fig. 5

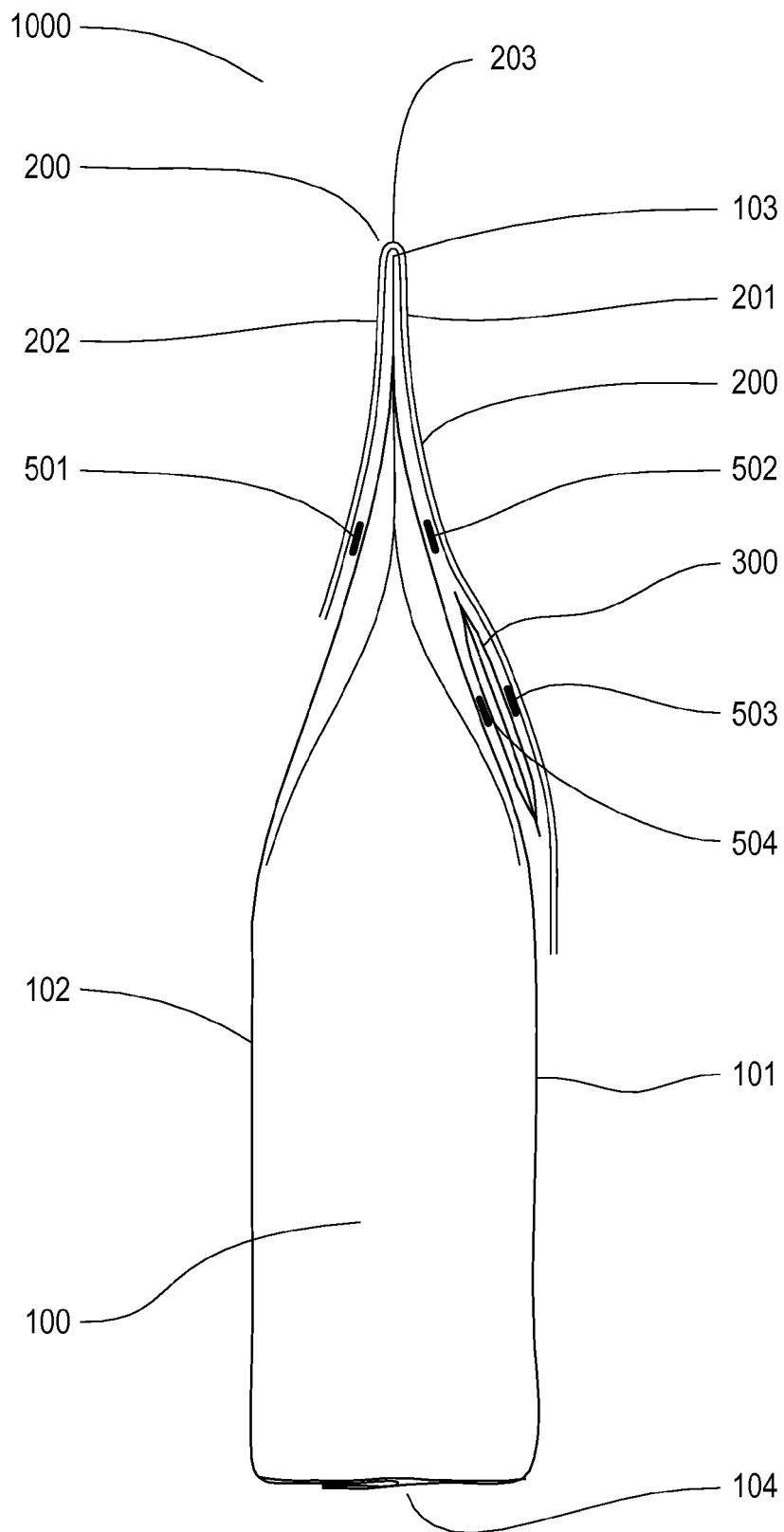


Fig. 6

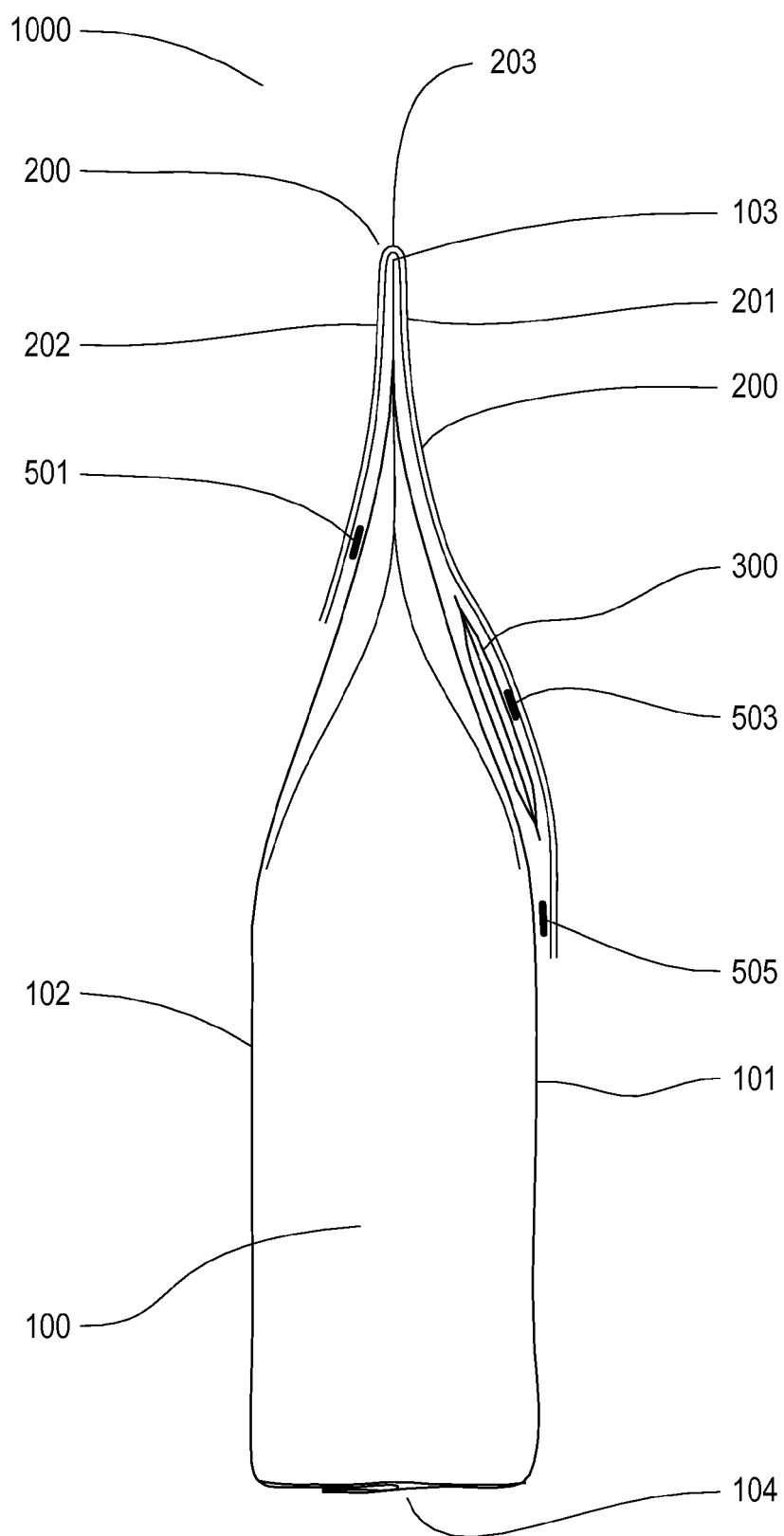


Fig. 7

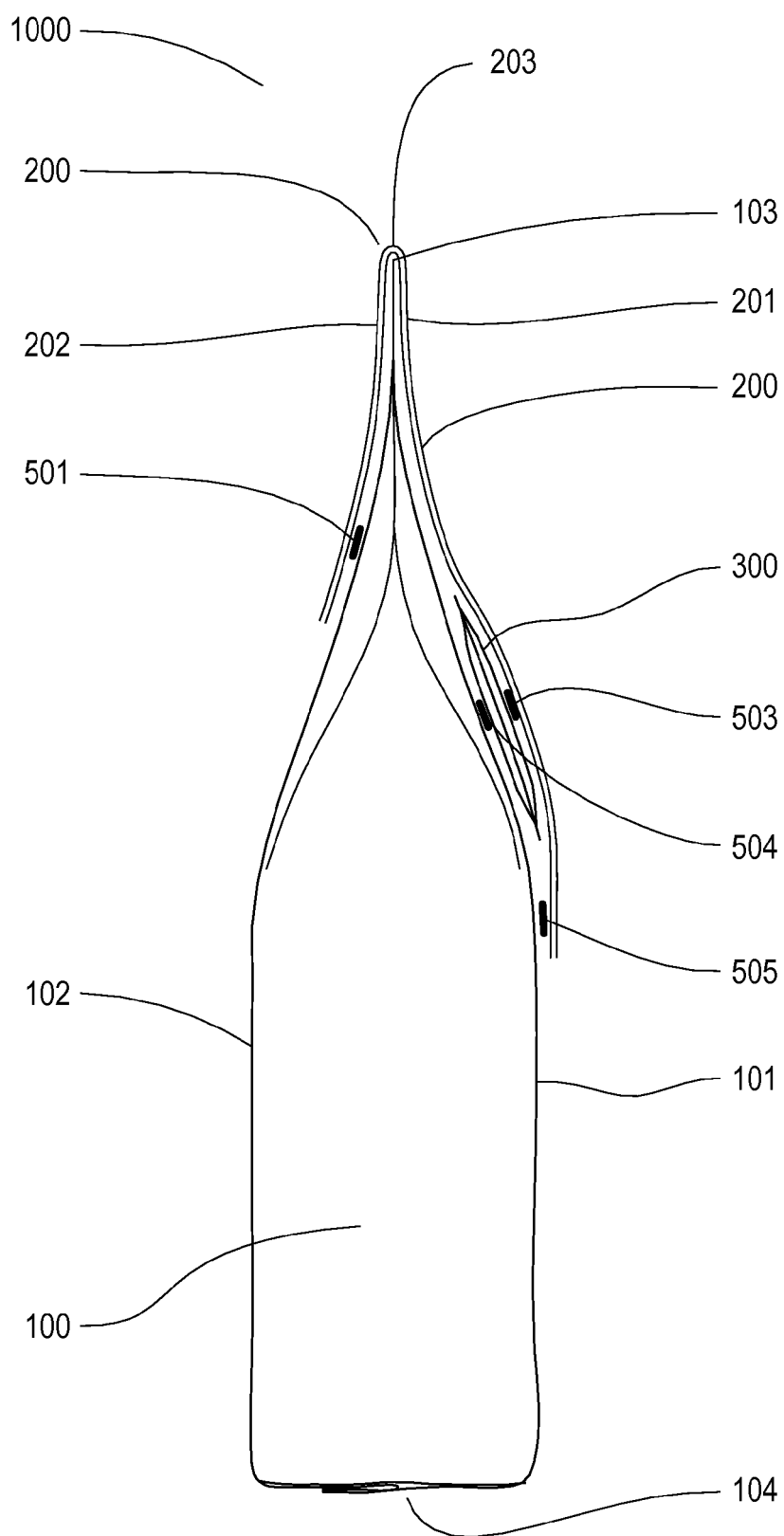


Fig. 8

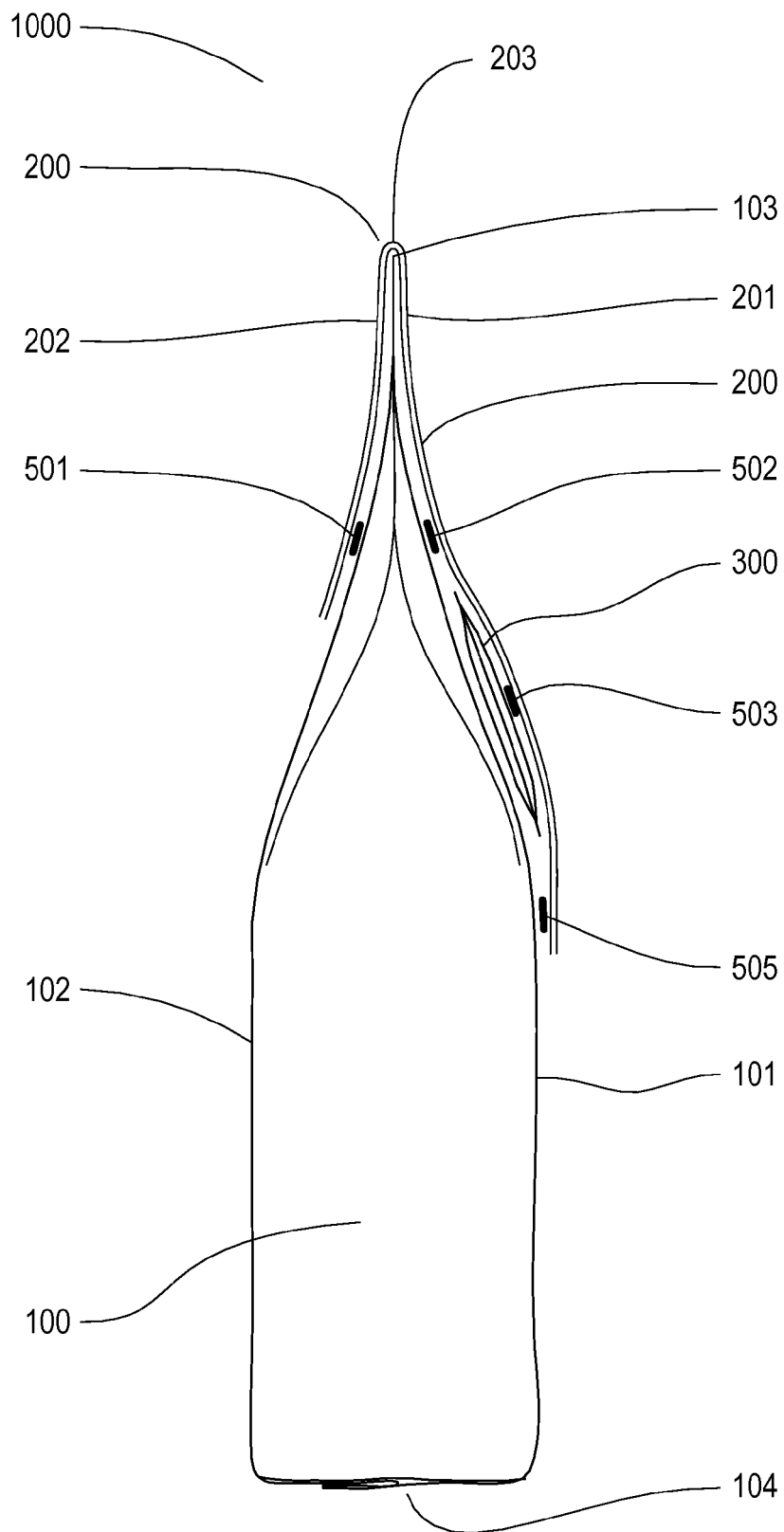


Fig. 9

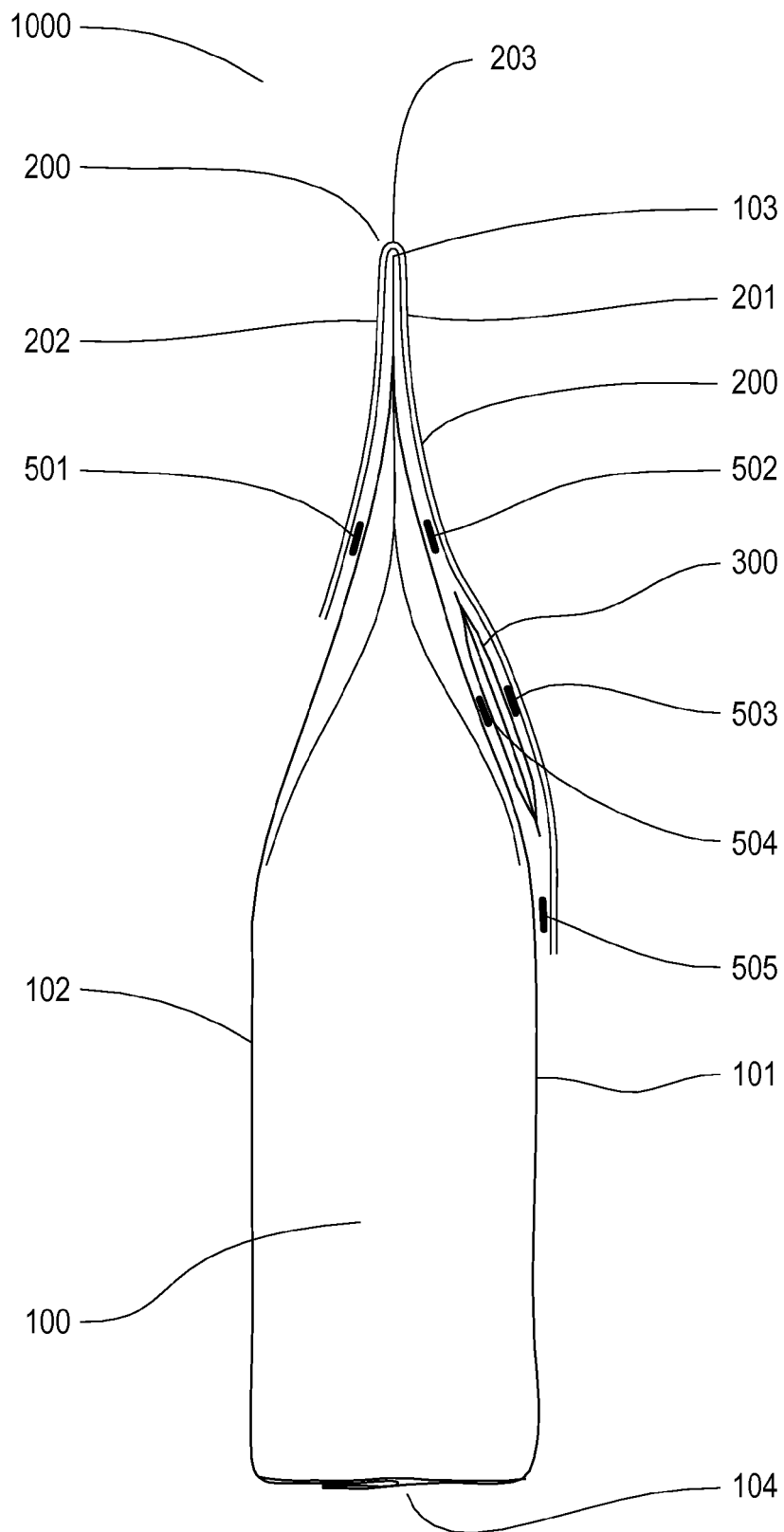


Fig. 10

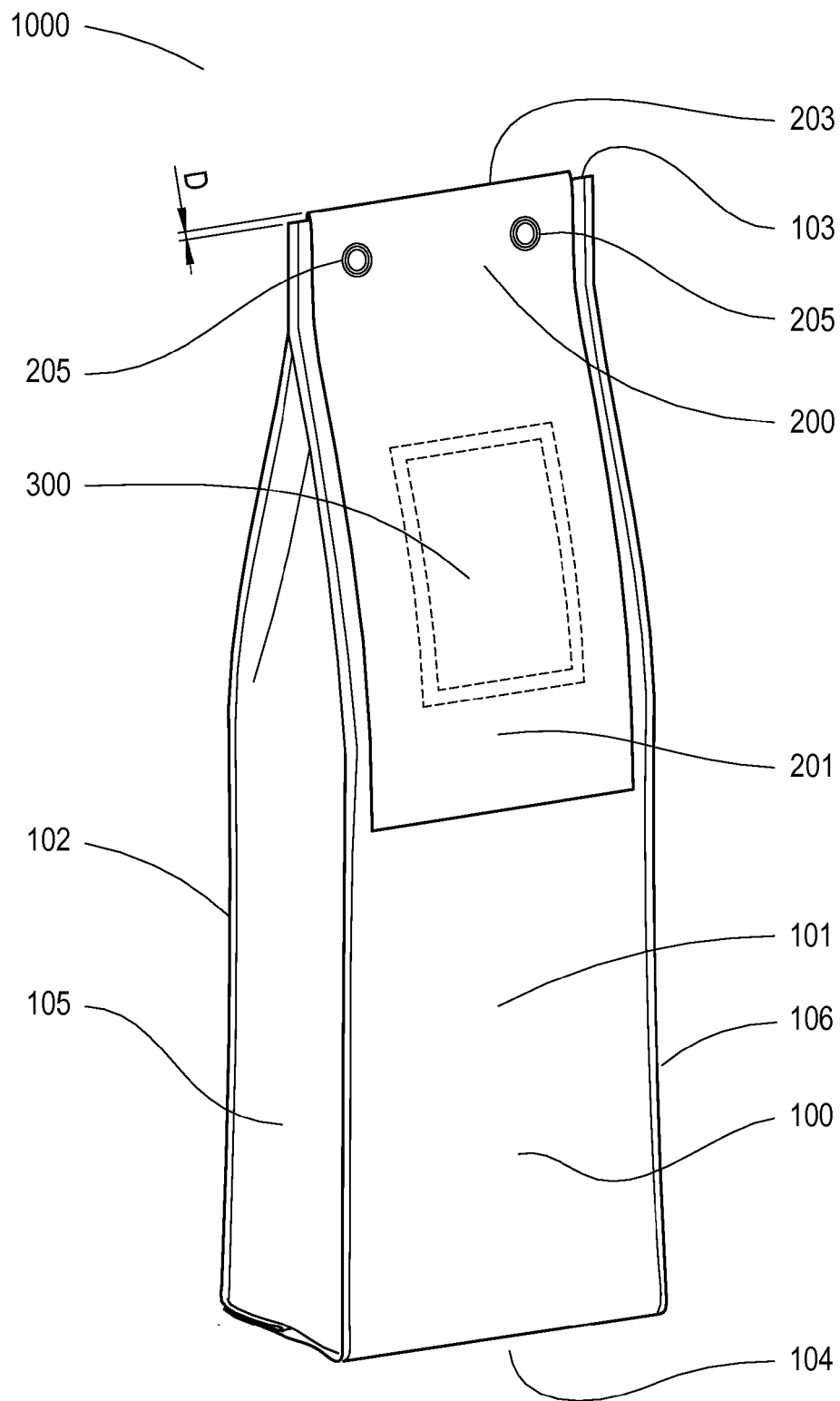


Fig. 11

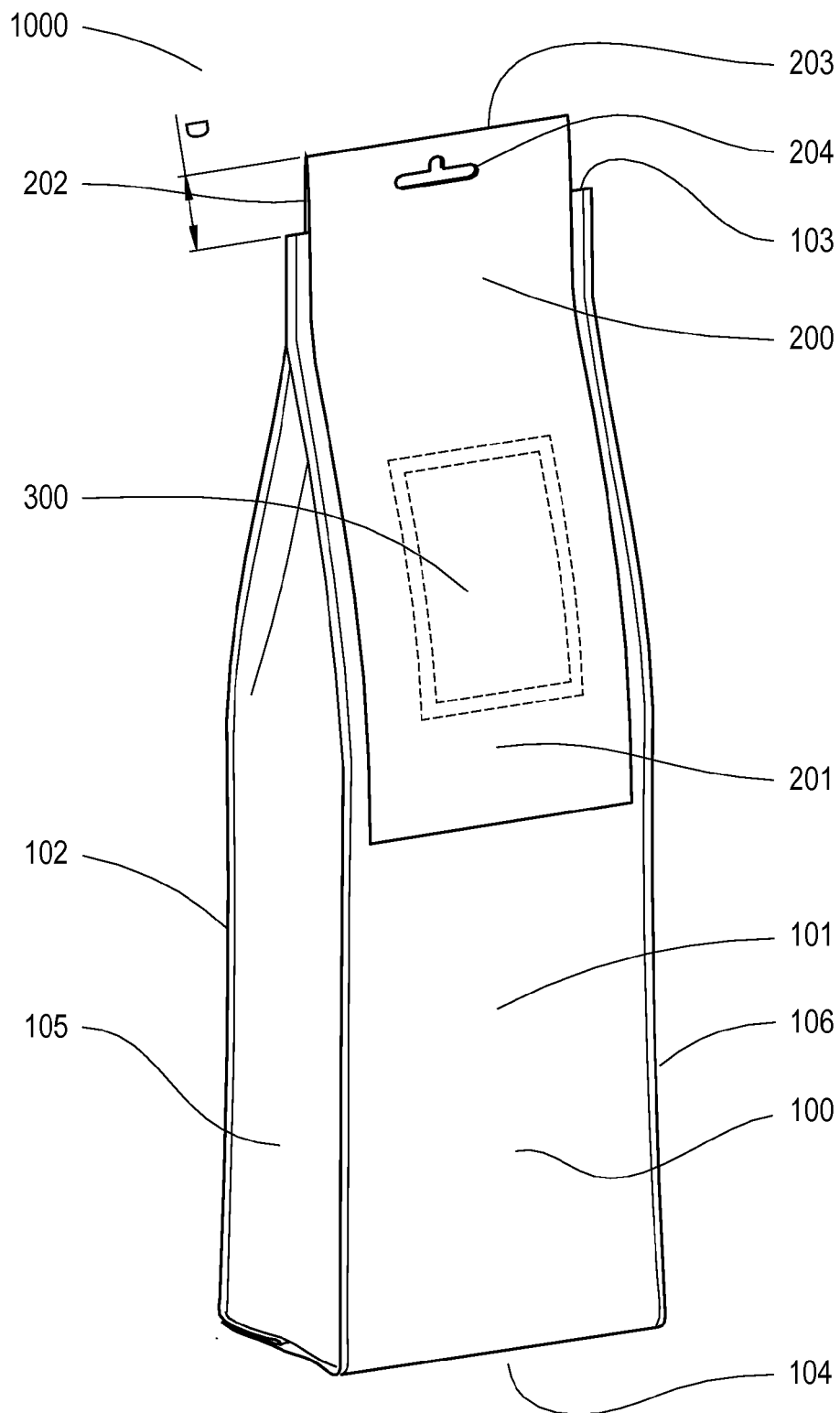


Fig. 12

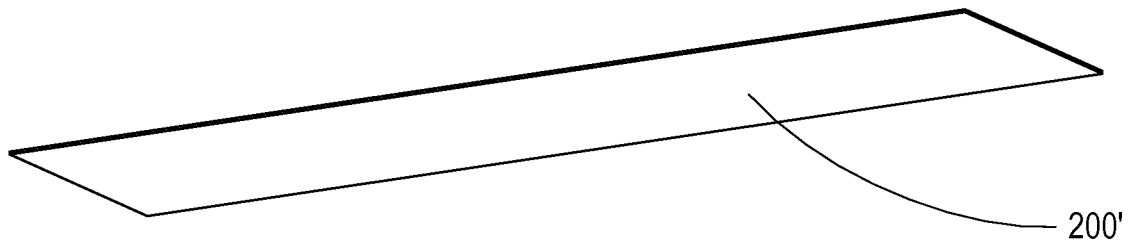


Fig. 13

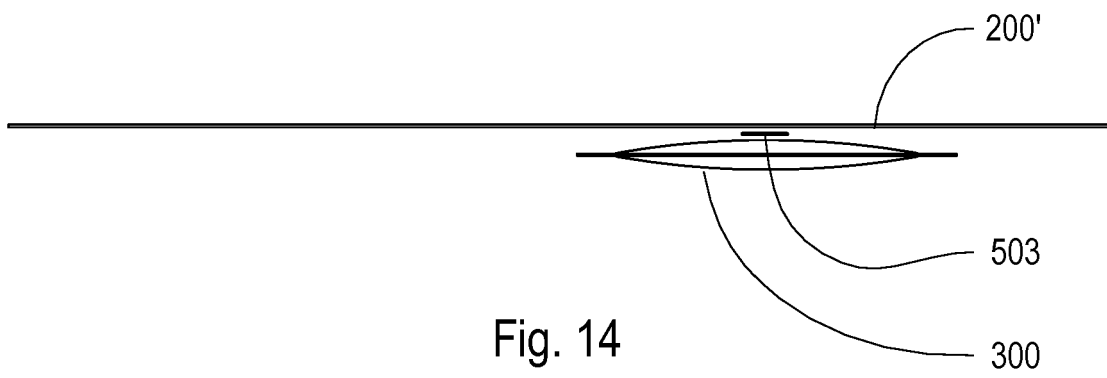


Fig. 14

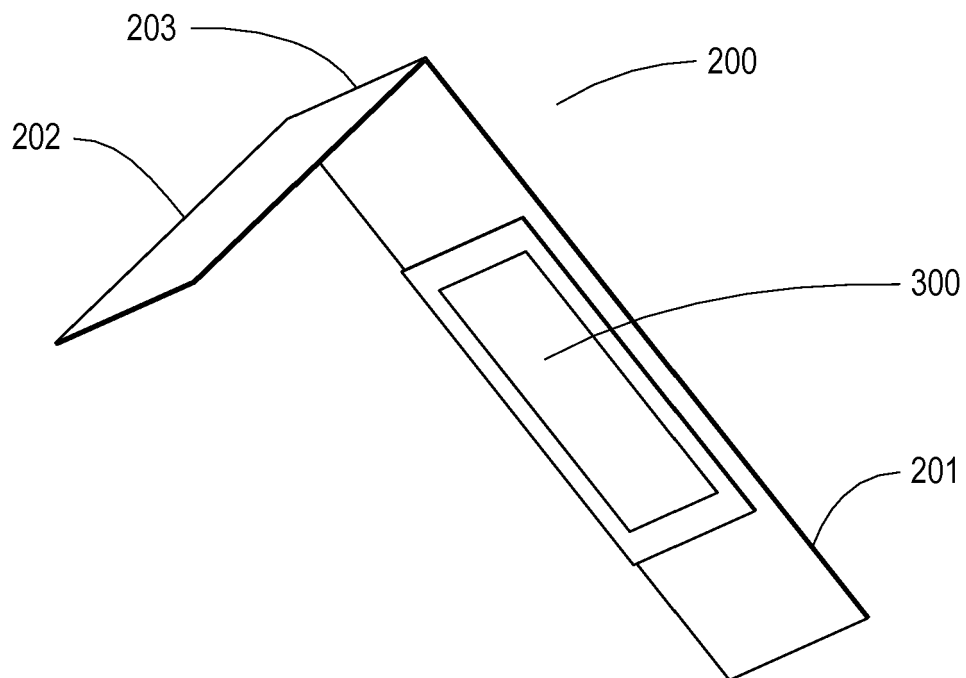


Fig. 15

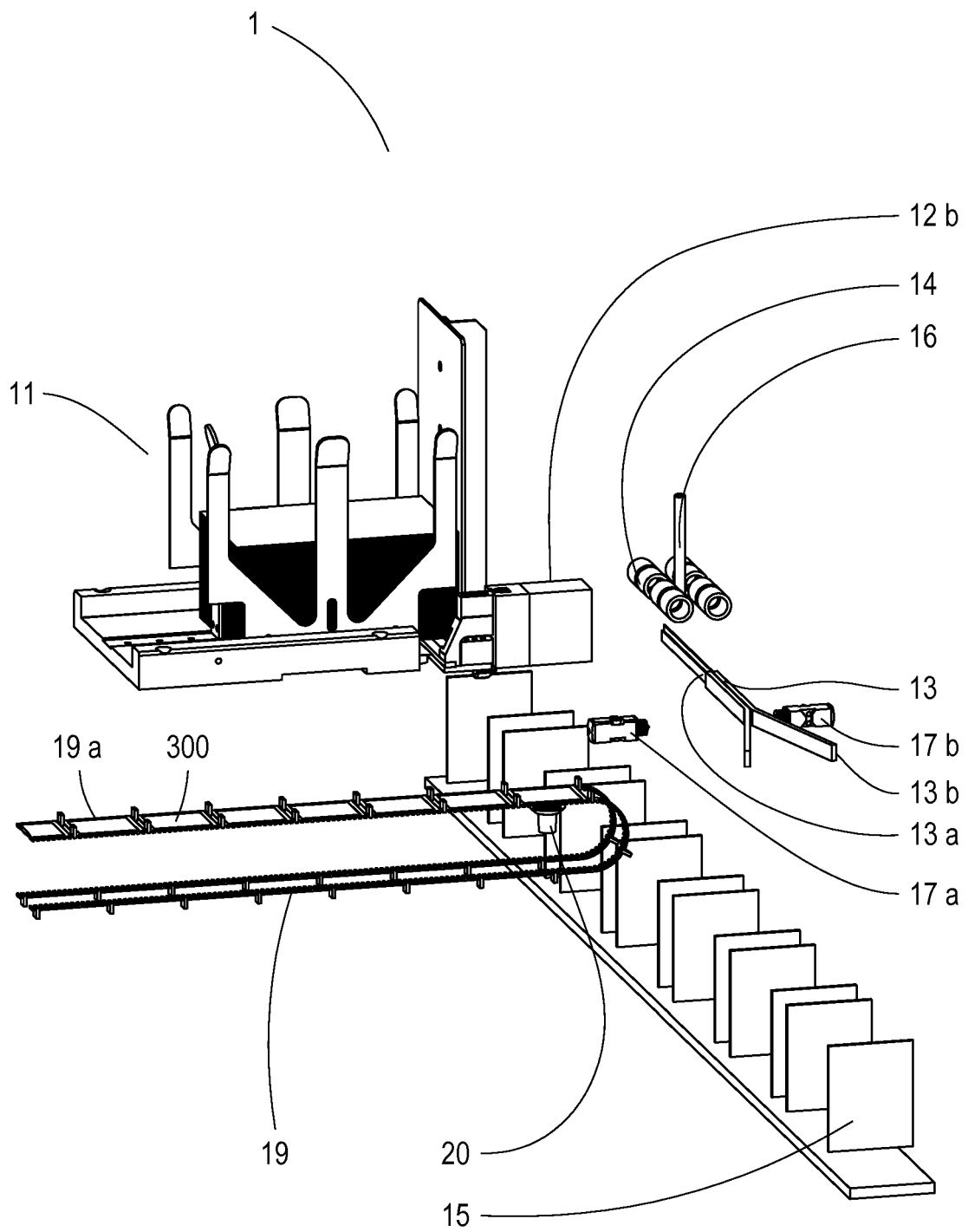


Fig. 16

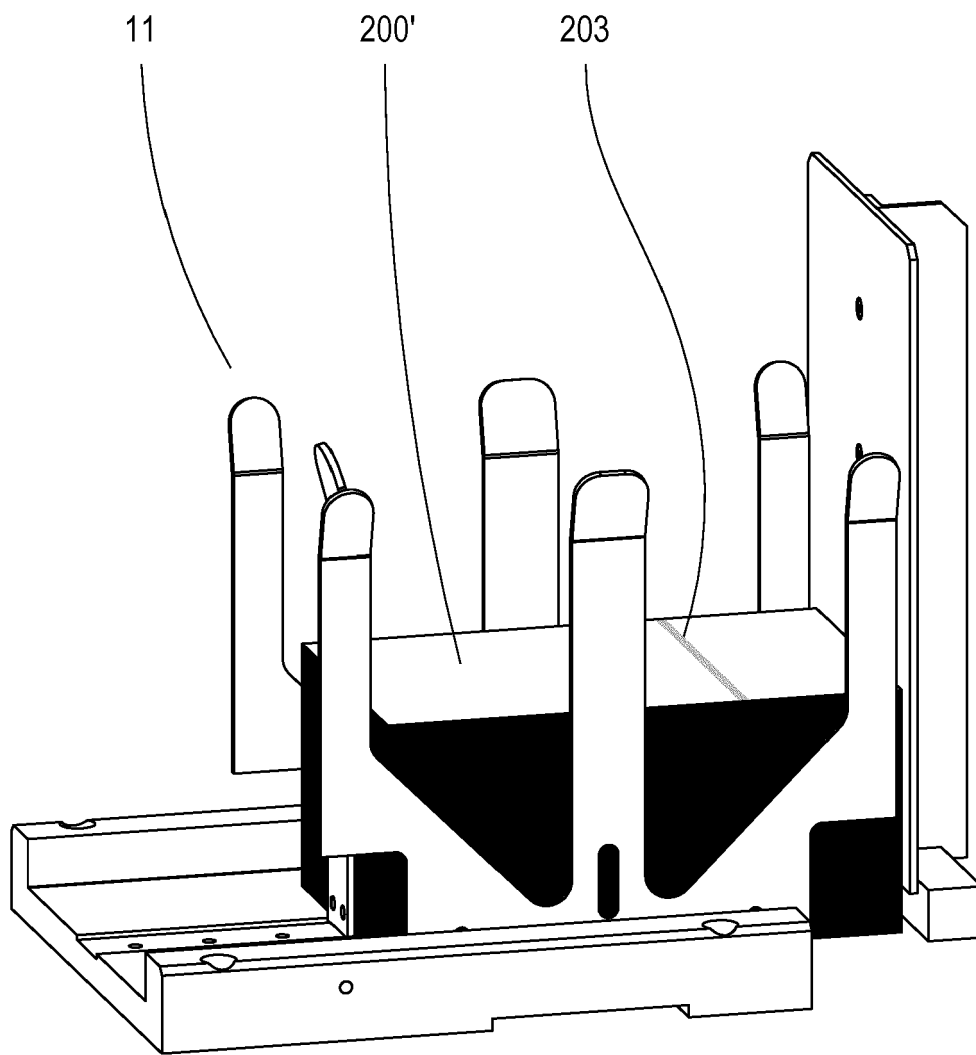


Fig. 17

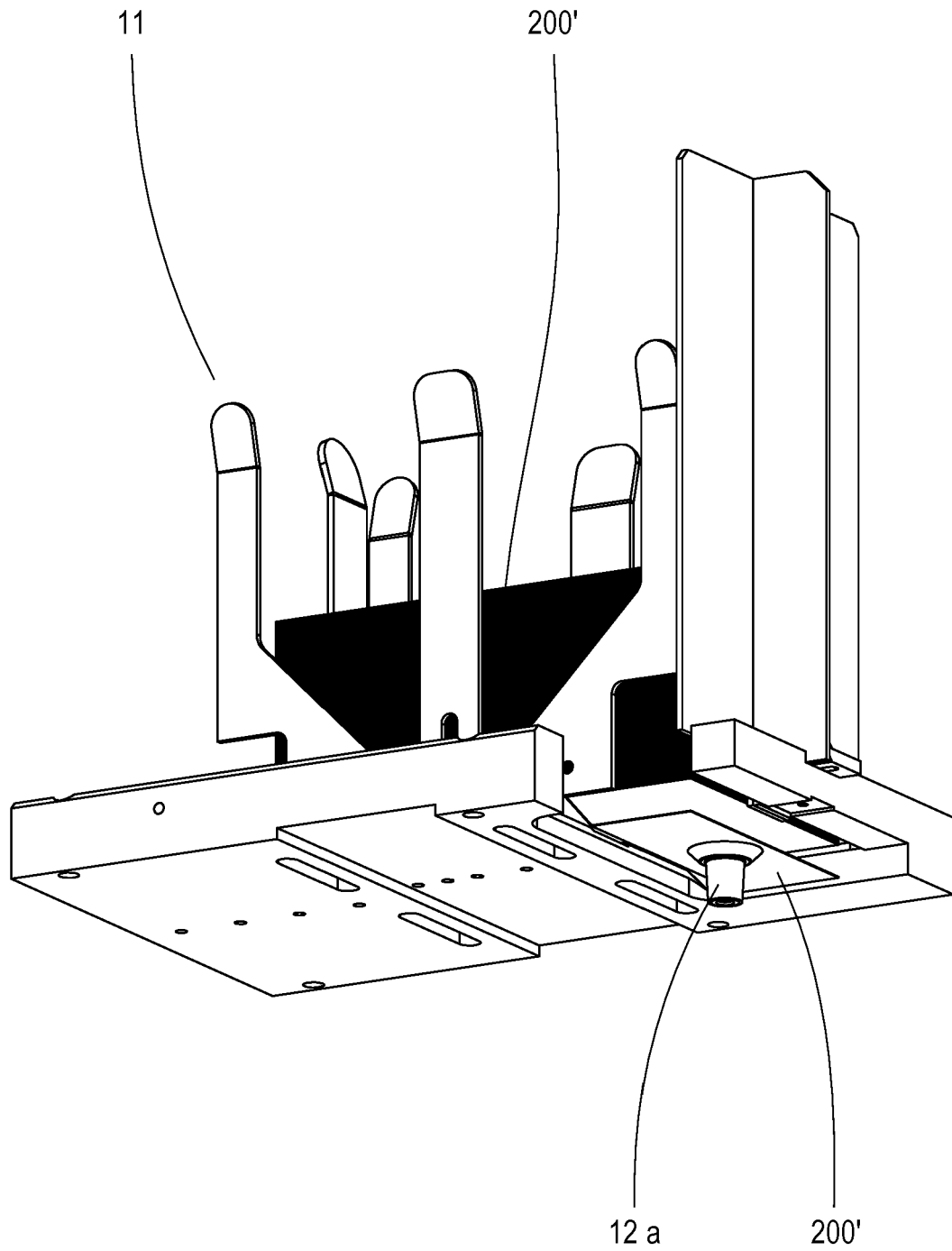


Fig. 18

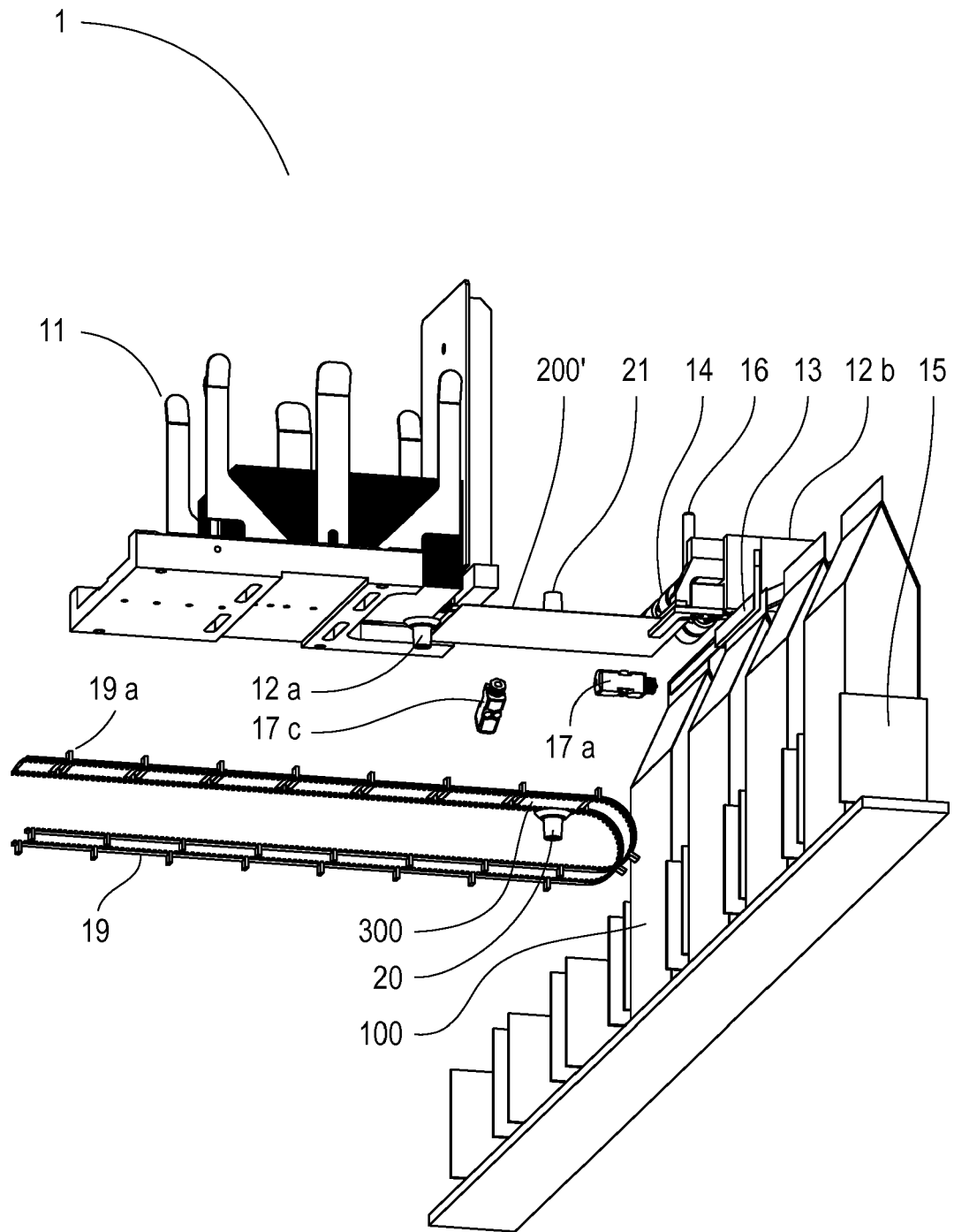


Fig. 19

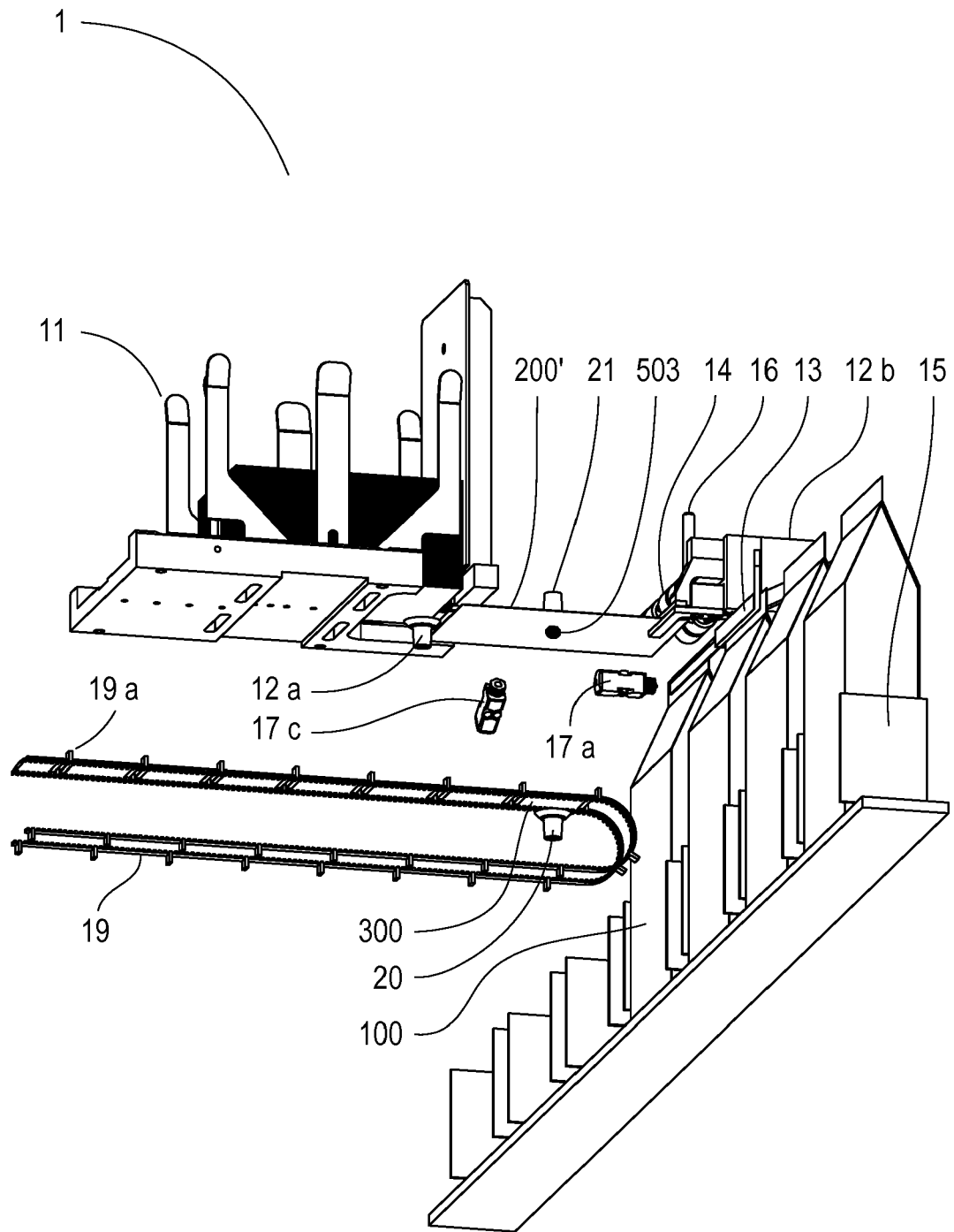


Fig. 20

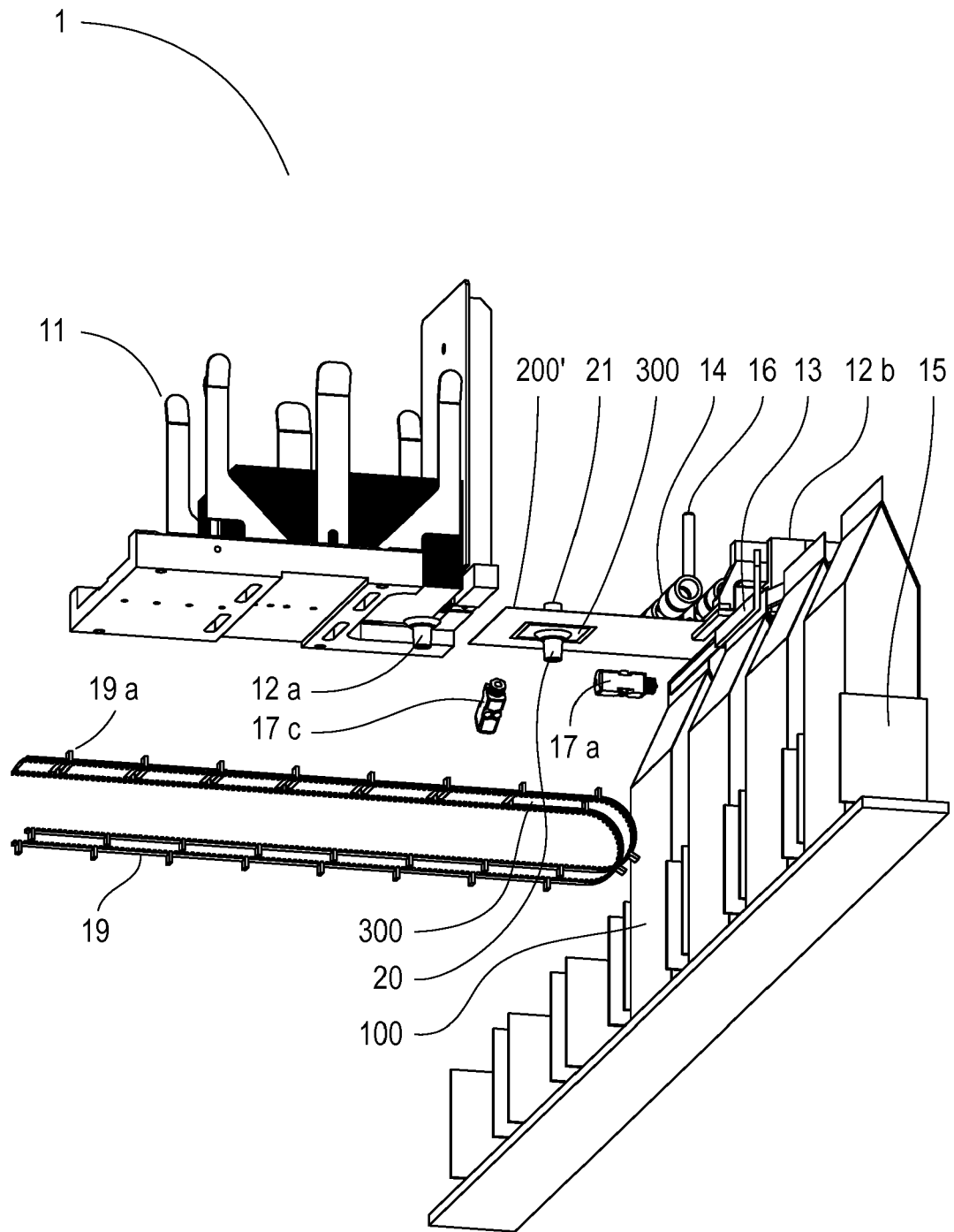


Fig. 21

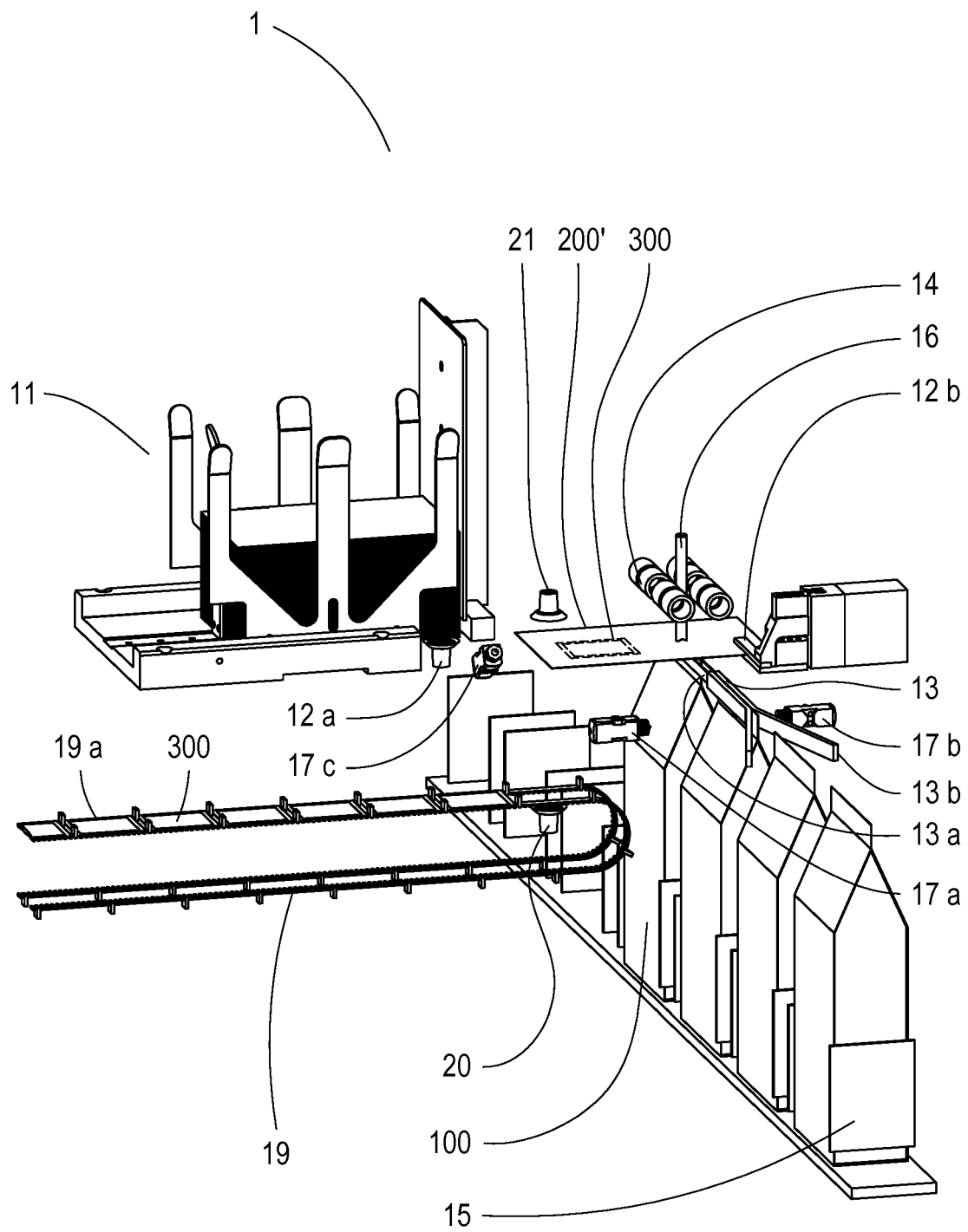


Fig. 22

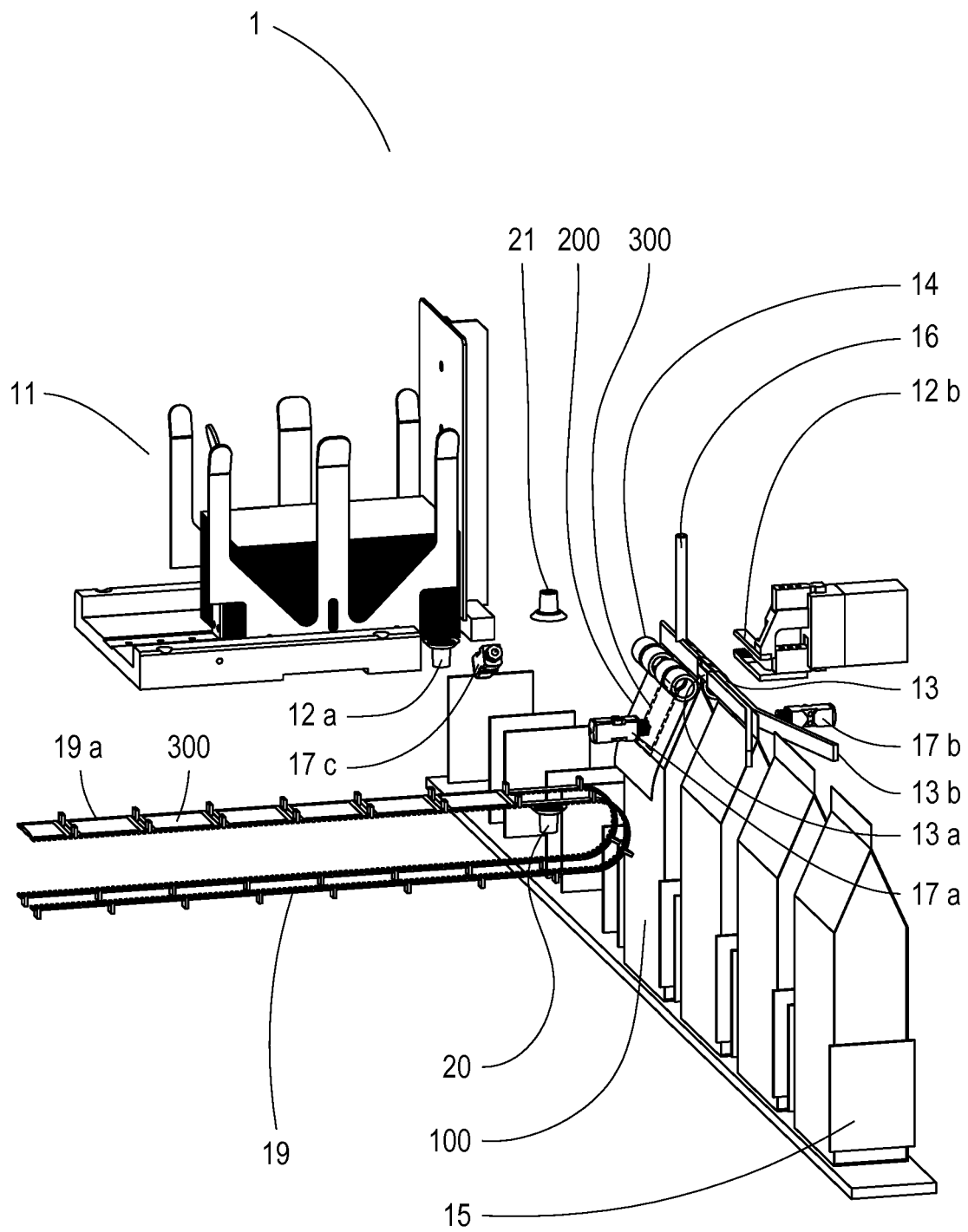


Fig. 23



EUROPEAN SEARCH REPORT

Application Number
EP 19 19 6406

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DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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A	FR 1 240 458 A (CHADESS SA) 2 September 1960 (1960-09-02) * page 1, column 2 - page 2, column 1; figures 1-2 *	1-15	
			TECHNICAL FIELDS SEARCHED (IPC)
			B65D
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 30 January 2020	Examiner Derrien, Yannick
CATEGORY OF CITED DOCUMENTS 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		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	

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The members are as contained in the European Patent Office EDP file on
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30-01-2020

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

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