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(54) Title: PACKAGE BLANK FOR A PACKAGE HOLDING A BOBBIN, A BOBBIN AND A SLEEVE BLANK THEREFOR

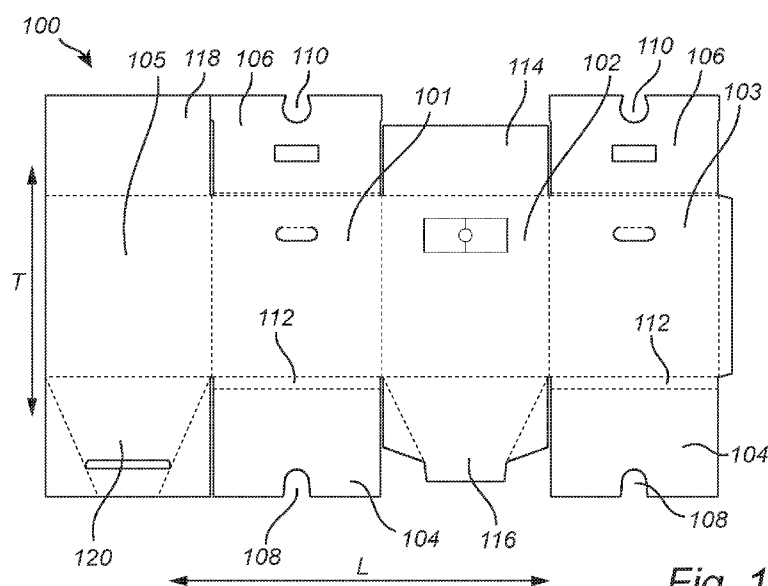


Fig. 1

(57) Abstract: The disclosure relates to a package blank (100) configured to be erected and thereby form a package for holding a bobbin (300), the package blank comprising: a set of side wall panels comprising two side wall panels (101, 103) configured to form two opposing outer side wall panels of the package, wherein each outer side wall panel is foldably connected to a respective inner side wall bottom flap (104) and a respective inner side wall top flap (106), wherein respective inner side wall bottom flap (104) is configured to form an inner side of a bottom part of respective side wall and is provided with an upwardly facing cut-out (108) configured to receive an associated end portion of a bobbin (300), and wherein the respective inner side wall top flap (106) is configured to form an inner side of a top part of the respective side wall and is provided with a downwardly facing cut-out (110) configured to at least partly cap the associated end portion of said bobbin (300). Also disclosed is a package formed of the package blank, a bobbin and a sleeve

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PACKAGE BLANK FOR A PACKAGE HOLDING A BOBBIN, A BOBBIN AND
A SLEEVE BLANK THEREFOR

Field of the invention

The invention relates to a package blank configured to be erected and thereby form a package for holding a bobbin.

- 5 The invention also relates to a bobbin for placement in such a package. The invention also relates to a sleeve blank for forming such a bobbin.

Background art

- 10 When designing a bobbin, it is often desirous to take into account a number of different design criteria. The bobbin should e.g. often be designed such that it makes efficient use of the material, be easy to transport to the point of use, be easy to prepare for use, and it should provide a strong reel structure. It should be strong during handling and it should be stable in an
15 erected state. It is often also desirous to design a bobbin that can be transported with an elongated product wound around such a bobbin.

- Bobbins are used to wind various elongated products from thread to electrical cords. Cardboard reels are beneficial since they do not take up much space before they are erected, and thus allow for space efficient
20 transport in a flat laid state. Often, when the elongated product has been wound on the bobbin, the bobbins are transported in boxes or packages protecting the elongated product. There exist numerous attempts to address the above design criteria in connection to designing a box for a bobbin made of cardboard material.

- 25 US8662433 discloses a cable reel package including a box having a top, a bottom, two opposing side walls, a front wall and a back wall. Each side wall comprising a slot with an upper end forming a holder for a reel. The package further comprises an axle member mounted in the slots and a pool mounted onto the axle member. The front wall may comprise a pay-out
30 aperture being generally rectangular in shape.

US2005035240 discloses a container for a roll of a wire. The container has a top, a bottom, two opposing side walls, a front wall and a back wall. Each side wall comprising a slot with an upper end forming a holder for a reel. The container further comprises additional side top panels holding the roll in place by being folded down over the roll when said roll of wire is placed in the container.

It may be noted that none of the prior art documents discloses a package for a bobbin which adequately addresses the set of design criteria that the reel should make efficient use of the material, be easy to transport to the point of use, and provide a strong reel structure.

Summary of the invention

It is an object of the invention to provide a package which addresses the set of design criteria that the package should be mechanically stable and provide a strong structure, it should be easy to erect, and it should provide a simple solution to holding a bobbin or a reel. It is also an object of the invention to provide a package that is easy to transport to the point of use.

To achieve at least this object and also other objects that will be evident from the following description, a package blank, a bobbin, a package and a sleeve blank is provided according to the present invention. Preferred embodiments of the device will be evident from the dependent claims.

According to a first aspect, there is provided a package blank configured to be erected and thereby form a package for holding a bobbin. The package blank comprises a set of side wall panels comprising a first side wall panel, a second side wall panel and a third side wall panel being foldably interconnected and arranged one after the other along a longitudinal direction of the blank as seen in a flat laid state of the package blank. The first and third side wall panels, are configured to form two opposing outer side wall panels of the package. Each outer side wall panel is foldably connected to a respective inner side wall bottom flap and a respective inner side wall top flap. The respective inner side wall bottom flap and the respective inner side wall top flap are positioned on opposing transversal sides, as seen in a flat-laid state of the package blank, of the respective outer side wall panel. The

respective inner side wall bottom flap is configured to form an inner side of a bottom part of the respective side wall and is provided with an upwardly facing cut-out configured to receive an associated end portion of a bobbin. The respective inner side wall top flap is configured to form an inner side of a top part of the respective side wall and is provided with a downwardly facing cut-out configured to at least partly cap the associated end portion of said bobbin. The upwardly facing cut-out may be shaped such that the associated end portion of the bobbin is rotatable in and relative to the upwardly facing cut-out about a rotational axis of the bobbin. Alternatively, the upwardly facing cut-out may be shaped such that the associated end portion of the bobbin is not rotatable in and relative to the upwardly facing cut-out about a rotational axis of the bobbin. The bobbin may be formed of one or more pieces being designed to be rotated as a single unit. Alternatively, the bobbin may be formed as an outer rotatable unit formed of one or more pieces being designed to be rotatable relative to one or more other pieces forming a central shaft. In case the bobbin is formed as a single rotatable unit, it is preferred that the upwardly facing cut-out is shaped such that the associated end portion of the bobbin is rotatable in and relative to the upwardly facing cut-out about a rotational axis of the bobbin. In case the bobbin is formed with an outer rotatable unit and a central shaft, the central shaft may, but need not, be rotatable in and relative to the upwardly facing cut-out. The corresponding reasoning also applies for the downwardly facing cut-out. The bobbin may, but need not, be rotatable in and relative to the downwardly facing cut-out.

With such a design, it is possible to provide a package for holding a bobbin that is stable, easy to erect, and easy to transport to the point of use.

The design with an inner side wall top flap and an inner side wall bottom flap being provided with cut-outs which face each other, and which are configured to receive an associated end portion of a bobbin allows for the package blank to be erected into a package without any use of adhesive, hence the assembly of the package may be facilitated. By the respective inner side wall bottom flap comprising a cut-out for receiving an associated end of a bobbin, a stable package for holding a bobbin may be provided. This

since the bottom part of the respective inner wall bottom flap may act as a support for holding the bobbin in its desired place.

By the inner side wall top flap having a cut out configured to partly cap the associated end of the bobbin, a locking mechanism for holding the bobbin in place may be provided. This since the bobbin is mechanically locked in place from at least two directions. The configuration may prevent the bobbin from moving in an upward or downward motion. Thus, there is provided a package with a reduced risk of displacement of the bobbin when an elongated product that has been wound around the bobbin is un-winded during usage of the package.

Each inner side wall bottom flap may be foldable relative to the respective outer side wall panel, along two separate fold lines forming an intermediate panel between the two separate fold lines. The intermediate panel may be configured to form part of a floor panel of the package. By this, the bobbin is provided with extra mechanical support and thus the bobbin may be held in a desired place. The inner side wall flap may be folded such that an angle is formed between the inner side wall flap and the intermediate panel such that a desired support is created. The angle may provide additional upholding support for the bobbin.

The two separate fold lines may be parallel. This may provide an even upholding support for the bobbin.

The second side wall panel may be configured to form a front wall panel of the package. The second side wall panel may be foldably connected to a front floor panel and a front top panel. The front floor panel and the front top panel may be positioned on opposing transversal sides, as seen in a flat-laid state of the package blank, of the second side wall panel.

It is preferred that the set of side wall panels further comprises a fourth side wall panel being configured to form a rear wall panel of the package. The fourth side wall panel may be foldably connected to a rear top panel and a rear floor panel. The rear floor panel and the rear top panel may be positioned on opposing transversal sides, as seen in a flat-laid state of the package blank, of the fourth side wall panel.

The "front" of the package and the "rear" of the package are mainly labels used to differentiate the different side wall panels from each other and are based on the orientation of the package as used in the drawings. In a preferred embodiment, the panel labelled front wall panel is actually the front wall panel. However, it is also conceivable that in actual use, the orientation may be different such that the panel labelled rear wall panel may be used as a front wall panel.

It is preferred that the blank is made of paper-based material. The paper-based material may be cardboard. Paper-based material may provide a light weight package. Paper-based material is environmentally friendly and can be recycled in a simple manner. Paper-based material may provide a package that is easy to transport and handle before erection of the package. Paper-based material may provide mechanical stability when used for the blank.

The front wall panel may comprise a cut-out. The cut-out may be configured to allow out-feeding of an elongated product that has been wound up on the bobbin inside the package. The cut-out may be configured as a perforated cut-out such that there e.g. is presented a complete front wall panel during transportation and where the front wall panel may be opened and present an opening defined by the cut-out when needed.

Each opposing outer side wall panel may further comprise a handle cut-out configured to be used as a handle. Each inner side wall top flap preferably comprises a handle cut-out configured to at least partly coincide with the respective handle cut-out of the respective outer side wall panel. By this configuration, a simple to use package may be provided. By providing handles, the package may in an erected state easily be moved around and transportation thereof may be facilitated. Also, the handle-cut out may be in the form of perforation allowing the user to remove or fold a portion of the panel to form a handle.

According to a second aspect, there is provided a bobbin configured to receive an elongated product being coiled or wound around the bobbin. The bobbin comprises:

two opposing end panels,

a central shaft extending along a geometrical axis;

a sleeve blank comprising:

a plurality of centre panels being arranged one after the other along a longitudinal direction and being foldable relative to each other along

5 transversely extending fold lines,

a plurality of corner panels, each corner panel being provided between two neighbouring centre panels at a centre portion, as seen along a transverse direction, of the neighbouring centre panels, wherein each corner panel is connected to one of the two neighbouring
10 centre panels along a fold line, and is separated from, or separable from, the other of the two neighbouring centre panels by a cut line, or a perforation,

a plurality of end cut-outs being provided in the centre panels at a transversal position outside the corner panels, each end cut-out
15 extending across a fold line between neighbouring centre panels and each having an extension in the longitudinal direction.

The sleeve blank is configured to be coiled into a bobbin coil by folding the centre panels relative to each other and to be positioned around the central shaft. Each one of the two opposing end panels is provided with a cut-
20 out configured to receive a respective end of the bobbin coil.

The respective end of the bobbin coil may have a polygonal cross-section formed by transversely outer portions of the centre panels. The cut-out of the respective end panel has a shape being at least partly congruent with the polygonal cross-section such that the respective end of the bobbin
25 coil is insertable into the cut-out of the respective end panel to such an extent that the end panel becomes positioned in register with the end cut-outs and such that the respective end panel is rotatable an angle about the geometrical axis such that internal edge portions of the end panel enters into slits formed by the end cut-outs at the corners of the polygonal shape of the bobbin coil .
30 Thereby, the end panels will be prevented from sliding in the transverse direction, or alternatively said prevented from sliding along the geometrical axis, relative to the bobbin coil. Advantageously, the stability of the package comprising the bobbin may be increased. The transportation and handling of

the package when an elongated product is wound around the bobbin, and the bobbin is placed in the package, may be facilitated by this configuration.

The sleeve blank may further comprise a locking flap being provided at a first longitudinal position and a slit being provided at a second longitudinal position, at a distance from the first longitudinal position, and being configured to receive the locking flap when the sleeve is folded around the central shaft. It is to be noted that the slit may be provided at any position of the sleeve. By way of example, the slit may be provided at a fold line, or in the middle of one of the panels, etc.

The distance between the first and second longitudinal positions is at least large enough to secure that there is at least one transversal fold line, preferably a plurality of transversal fold lines, between the centre panel to which the locking flap is connected and the slit. Thereby, the coiling of the sleeve blank will aid in keeping the locking flap positioned in the slit.

It is preferred that the bobbin is made of paper-based material. Paper-based material may provide a light weight package. Paper-based material is environmentally friendly and can be recycled in a simple manner. Paper-based material may provide a package that is easy to transport and handle before erection of the package. Paper-based material may provide a mechanically stability to the bobbin.

According to a third aspect, there is provided a package. The package comprises a package blank according to the first aspect, and a bobbin according to the second aspect.

Advantages associated with the different features and preferred embodiments of the third aspect, the package, have been discussed in detail in the above in relation to the first and second aspects, the package blank and the bobbin. The discussion is equally valid in relation to the package. It may be noted that the various preferred embodiments or optional features described above are equally applicable to the package.

According to a fourth aspect, there is provided a sleeve blank configured to be folded into a bobbin coil, the sleeve blank comprising:

a plurality of centre panels being arranged one after the other along a longitudinal direction and being foldable relative to each other along transversely extending fold lines,

- a plurality of corner panels, each corner panel being provided between
5 two neighbouring centre panels at a centre portion, as seen along a transverse direction, of the neighbouring centre panels, wherein each corner panel is connected to one of the two neighbouring centre panels along a fold line, and is separated from, or separable from, the other of the two neighbouring centre panels by a cut line, or a perforation,
10 a plurality of end cut-outs being provided in the centre panels at a transversal position outside the corner panels, each end cut-out extending across a fold line between neighbouring centre panels and each having an extension in the longitudinal direction.

- The sleeve blank is configured to be coiled into a bobbin coil by folding
15 the centre panels relative to each other. The bobbin coil is then in turn preferably configured to be positioned around a central shaft and thereby form a bobbin, the central shaft preferably having a circular cross-section.

- It may be noted that in case the end portions of the bobbin coil being exposed outside the end panels is rotatable in and relative to the upwardly
20 and downwardly facing cut-outs, it is conceivable to design the bobbin without a separate central shaft.

- The sleeve blank may further comprise a locking flap being provided at a first longitudinal position and a slit being provided at a second longitudinal position, at a distance from the first longitudinal position, and being configured
25 to receive the locking flap when the sleeve is folded around the central shaft.

It is preferred that the sleeve blank is made of paper-based material.

- Advantages associated with the different features and preferred embodiments of the fourth aspect, the sleeve blank, have been discussed in detail in the above in relation to the second aspect, the bobbin. The
30 discussion is equally valid in relation to the sleeve blank. It may be noted that the various preferred embodiments or optional features are equally applicable to the sleeve blank.

The invention may also in short be said to relate to a package having a first, a second and a third side wall, wherein the first and third side wall comprises a respective inner side wall bottom flap being foldably connected to respective side wall, wherein each respective inner side wall bottom flap is
5 configured to be folded relative to the respective side wall and wherein each inner side wall bottom flap comprises a cut-out configured to receive a respective end of a bobbin when the package is erected. The package further includes a bobbin comprising two opposing end panels, a central shaft extending along a geometrical axis, and a sleeve blank.
10 The sleeve blank comprises a plurality of centre panels, a plurality of corner panels, each corner panel being provided between two neighbouring centre panels at a centre portion, and a plurality of end cut-outs being provided in the centre panels at a transversal position outside the corner panels. The sleeve blank is configured to be folded around the central shaft to form a bobbin coil. The
15 bobbin is insertable into to package.

The invention may also in short be said to relate to a package blank configured to be erected and thereby form a package for holding a bobbin, the package blank comprising: a set of side wall panels comprising two side wall panels configured to form two opposing outer side wall panels of the
20 package, wherein each outer side wall panel is foldably connected to a respective inner side wall bottom flap and a respective inner side wall top flap, wherein respective inner side wall bottom flap is configured to form an inner side of a bottom part of respective side wall and is provided with an upwardly facing cut-out configured to receive an associated end portion of a bobbin,
25 and wherein the respective inner side wall top flap is configured to form an inner side of a top part of the associated side wall and is provided with a downwardly facing cut-out configured to at least partly cap the associated end portion of said bobbin.

Generally, all terms used in the claims are to be interpreted according
30 to their ordinary meaning in the technical field, unless explicitly defined otherwise herein. All references to "a/an/the [element, device, component, means, step, etc]" are to be interpreted openly as referring to at least one instance of said element, device, component, means, step, etc., unless

explicitly stated otherwise. The steps of any method disclosed herein do not have to be performed in the exact order disclosed, unless explicitly stated.

Brief Description of the Drawings

- 5 The above, as well as additional objects, features and advantages of the present invention, will be better understood through the following illustrative and non-limiting detailed description of preferred embodiments of the present invention, with reference to the appended drawings, where the same reference numerals will be used for similar elements, wherein:
- 10 Fig. 1 illustrates a package blank.
 Fig. 2 illustrates a package.
 Fig. 3 illustrates a bobbin.
 Fig. 4A illustrates a sleeve blank.
 Fig. 4B illustrates a folded sleeve.
15 Fig. 4C illustrates a bobbin coil.
 Fig. 5 illustrates an end panel of a bobbin.

Description of Embodiments

20 The present invention will now be described more fully hereinafter with reference to the accompanying drawings, in which currently preferred embodiments of the invention are shown. This invention may, however, be embodied in many different forms and should not be construed as limited to the embodiments set forth herein; rather, these embodiments are provided for thoroughness and completeness, and fully convey the scope of the invention
25 to the skilled person.

 With reference, to Figs. 1 and 2, there is disclosed a package 200 and a package blank 100 for forming a wall structure of such a package 200. The package further comprises a bobbin 300 for placement in the package 200.

30 The package 200 is formed by a package blank 100 being configured to be erected into the wall structure of said package 200.

 The package blank 100 has an extension in a longitudinal direction L, and an extension in a transverse direction T, as seen in a flat laid state of the package blank 100.

The package blank 100 comprises a set of side wall panels. The set of side wall panels comprises a first side wall panel 101, a second side wall panel 102, and a third side wall panel 103. Preferably, the set of side wall panels comprises a fourth side wall panel 105. The side wall panels are
5 foldably interconnected and arranged one after the other along the longitudinal direction L of the blank. The first and second side wall panels 101, 103 are configured to form two opposing outer side wall panels.

Each outer side wall panel is foldably connected to a respective inner side wall bottom flap 104 and a respective inner side wall top flap 106. The
10 respective inner side wall bottom flap 104 and the respective inner side wall top flap 106 are positioned on opposing transversal sides, as seen in a flat-laid state of the package blank, of the respective outer side wall panel.

Each respective inner side wall bottom flap 104 is configured to form an inner side of a bottom part of the respective side wall. Each respective
15 inner side wall bottom flap 104 is provided with an upwardly facing cut-out 108 configured to receive an associated end portion of a bobbin 300. When erecting the package, the inner side wall bottom flap is folded relative to the respective outer side wall panel such that each cut-out becomes upwardly facing. Accordingly, the bobbin can be placed in the upwardly-facing cut-outs
20 acting as a holder.

Each inner side wall bottom flap 104 may be foldable relative to the respective outer side wall panel 101, 103 along two separate fold lines. The two separate fold lines may form an intermediate panel 112 between the two separate fold lines. The intermediate panel 112 may be configured to form
25 part of a floor panel of the package. The two separate fold lines may extend in parallel.

Each respective inner side wall top flap 106 is configured to form an inner side of a top part of the respective side wall. The respective inner side wall top flap 106 is provided with a downwardly facing cut-out 110 configured
30 to at least partly cap the associated end portion of said bobbin 300.

When a bobbin has been placed in the upwardly facing cut-outs of the inner side wall bottom flaps, the inner side wall top flaps are folded relative to the respective outer side wall panel in a downward motion. Accordingly, the

downwardly facing cut-outs partly caps an upper side of the end of the bobbin. Thus, a mechanical lock is provided configured to hold the bobbin in place and prevent it from moving in a side to side or upward/downward motion.

5 Each opposing outer side wall panel may comprise a handle cut-out. The handle cut-out may be configured to be used as a handle. It is preferred that each inner side wall top flap 106 also comprises a handle cut-out. It is further preferred that the handle cut-out of the inner side wall top panel is configured to at least partly coincide with the respective handle cut-out of the
10 respective outer side wall panel.

 The second side wall panel 102 may be configured to form a front wall panel of the package. The second side wall panel 102 is foldably connected to a front floor panel 116, and a front top panel 114. The front floor panel 116 and the front top panel 114 are positioned on opposing transversal sides, as
15 seen in a flat-laid state of the package blank, of the second side wall panel. The front floor panel 116 may comprise a floor locking flap.

 The fourth side wall panel 105 may be configured to form a rear wall panel of the package 200. The rear wall panel may be foldably connected to a rear top panel 118, and a rear floor panel 120. The rear floor panel 120 and
20 the rear top panel 118 may be positioned on opposing transversal sides, as seen in a flat-laid state of the package blank, of the fourth side wall panel 105. The rear floor panel 120 may comprise a floor slit configured to receive the floor locking flap. By providing a floor locking flap and a floor slit for mechanically locking the floor of the formed package, a package may be
25 provided that is sturdy without requiring adhesive.

 Front and rear are mainly labels used to differentiate the different side wall panels from each other and are based on the orientation of the package as used in the drawings. In a preferred embodiment, the panel labelled front wall panel is actually the front wall panel. However, it is also conceivable that
30 in actual use, the orientation may be different such that the panel labelled rear wall panel may be used as front wall panel.

 The front and rear top panels 114, 118 may be configured to be folded such that a lid is formed when the package is erected.

As evident from Fig. 1, the front side wall panel may comprise a cut-out. Thus, as is disclosed the front wall panel may comprise the cut-out. The cut-out may be configured as a perforated cut-out such that the front wall panel may be opened when needed.

5 The bobbin disclosed in Fig. 2 will now be described in more detail with reference to Figs. 3-5.

Fig. 3 discloses a bobbin 300 in its entirety. The bobbin 300 comprises two opposing end panels 302, a bobbin coil 401, and a central shaft 304. The bobbin coil 401 is formed from a sleeve blank 400 folded around the central
10 shaft 304, which extends along a geometrical axis. The central shaft 304 preferably has a circular cross-section. In the preferred embodiment, end portions of the central shaft 304 is configured to be placed in the upwardly facing cut-outs of the inner side wall bottom flaps, and preferably also to be capped by the downwardly facing cut-outs of the inner side wall top flaps. It
15 may be noted that the end portions of the central shaft 304 are exposed on either side of the bobbin coil 401. The bobbin coil 401 may be rotatable relative to the central shaft 304 about the geometrical axis. The central shaft 304 may be rotatable in and relative to the cut-outs 108, 110 about the geometrical axis.

20 Fig. 4 discloses a sleeve blank 400. The sleeve blank 400 comprises a plurality of centre panels 402, a plurality of corner panels 404 and a plurality of end cut-outs 406. The centre panels 402 are arranged one after another along a longitudinal direction L2. The centre panels 402 are foldable relative to each other along transversely extending fold lines 403.

25 Each corner panel 404 is provided between two neighbouring centre panels 402 at a centre portion, as seen along the transverse direction T2, of the neighbouring centre panels 402. Each corner panel 404 is connected to one of the two neighbouring centre panels 402 along a fold line. Each corner panel 402 is separated from, or separable from, the other one of the two
30 neighbouring centre panels by a cut-line or a perforation.

The end cut-outs 406 are each provided in the centre panels 402 at a transversal position outside the corner panels 404. Each end cut-out 406

extends across a fold line between two neighbouring centre panels 402. Each cut-out has an extension in the longitudinal direction L2.

As evident from the figures, the sleeve blank 400 may comprise a locking flap 408 and a slit 410 configured to receive the locking flap 408. The locking flap 408 may be provided at a first longitudinal position. The slit 410 may be provided at a second longitudinal position. The second longitudinal position is provided at a distance from the first longitudinal position. The slit 410 may be configured to receive the locking flap 408 when the sleeve 400 is folded around the central shaft 304. The distance between the first and second longitudinal positions is at least large enough to secure that there is at least one transversal fold line between the centre panel 402 to which the locking flap 408 is connected and the slit 410. It is preferred that there is a plurality of transversal fold lines between the centre panel 402 to which the locking flap 408 is connected and the slit 410.

It is to be noted that the slit 410 may be provided at any position of the sleeve blank 400. By way of example, the slit 410 may be provided as an extension along a fold line. In another example the slit 410 may be provided in one of the panels.

In the disclosed embodiment, the sleeve blank 400 comprises two locking flaps 408, and two slits 410 for receiving a respective locking flap 408. The sleeve blank 400 is configured to be folded into a bobbin coil 401 as seen in Fig. 4B.

As seen in Fig. 4C, the sleeve blank 400 is configured to be coiled into a bobbin coil 401 and to receive a central shaft 304. The bobbin coil 401 is formed by folding the centre panels 402 relative to each other.

By the provision of a locking flap 408 and a slit 410, a mechanically stable bobbin coil 401 may be provided. The locking mechanism may reduce the risk of the sleeve blank 400 unfolding at an untimely manner. The locking mechanism may further facilitate the assembly of the bobbin coil 401 since the bobbin coil may be assembled without requiring any adhesive.

As evident from Fig. 5, the end panel 302 is provided with a cut-out 502. The cut-out 502 is configured to receive a respective end of the bobbin coil 401, when forming the bobbin 300.

Each respective end of the bobbin coil 401 may have a polygonal cross-section formed by transversely outer portions of the centre panels 402. The cut-out of respective end panel 302 may thus have a shape being at least partly congruent with the polygonal cross-section. Accordingly, the respective
5 end of the bobbin coil 401 is insertable into the cut-out 502 of the respective end panel to such an extent that the end panel 302 becomes positioned in register with the end cut-outs 406. The respective end panel 302 is rotatable an angle about the geometrical axis such that internal edge portions of the end panel 302 enters into slits formed by the end cut-outs 406 at the corners
10 of the polygonal shape of the bobbin coil 401. Thereby, the end panels will be prevented from sliding in the transverse direction, or alternatively said end panels will be prevented from sliding along the geometrical axis, relative to the bobbin coil 401.

Each end panel may comprise one or more cut-outs forming a handle
15 facilitating handling of the bobbin.

It will be appreciated that the present invention is not limited to the embodiments shown. Several modifications and variations are thus conceivable within the scope of the invention which thus is exclusively defined by the appended claims.

20 The person skilled in the art realizes that the present invention by no means is limited to the preferred embodiments described above. On the contrary, many modifications and variations are possible within the scope of the appended claims.

Additionally, variations to the disclosed embodiments can be
25 understood and effected by the skilled person in practicing the claimed invention, from a study of the drawings, the disclosure, and the appended claims. In the claims, the word "comprising" does not exclude other elements or steps, and the indefinite article "a" or "an" does not exclude a plurality. The mere fact that certain measures are recited in mutually different dependent
30 claims does not indicate that a combination of these measures cannot be used to advantage.

It may e.g. be noted that the two fold lines with an intermediate panel 112 therebetween may be replaced with a single fold line. Such a design may e.g. be useful when the package blank is formed of a relatively thick material.

CLAIMS

1. Package blank (100) configured to be erected and thereby form a package for holding a bobbin (300), the package blank comprising:

5 a set of side wall panels comprising a first side wall panel (101), a second side wall panel (102) and a third side wall panel (103) being foldably interconnected and arranged one after the other along a longitudinal direction (L) of the blank as seen in a flat laid state of the package blank, wherein the first and third side wall panels (101, 103) are configured to form two opposing
10 outer side wall panels of the package,

wherein each outer side wall panel is foldably connected to a respective inner side wall bottom flap (104) and a respective inner side wall top flap (106), wherein the respective inner side wall bottom flap (104) and the respective inner side wall top flap (106) are positioned on opposing
15 transversal sides, as seen in a flat-laid state of the package blank, of the respective outer side wall panel,

wherein the respective inner side wall bottom flap (104) is configured to form an inner side of a bottom part of the respective side wall and is provided with an upwardly facing cut-out (108) configured to receive an associated end
20 portion of a bobbin (300), and

wherein the respective inner side wall top flap (106) is configured to form an inner side of a top part of the respective side wall and is provided with a downwardly facing cut-out (110) configured to at least partly cap the associated end portion of said bobbin (300).
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2. Package blank (100) according to claim 1, wherein each inner side wall bottom flap (104) is foldable relative to the respective outer side wall panel (101, 103) along two separate fold lines forming an intermediate panel (112) between the two separate fold lines, the intermediate panel (112) being
30 configured to form part of a floor panel of the package.

3. Package blank (100) according to claim 2, wherein the two separate fold lines are parallel.

4. Package blank (100) according to any one of the previous claims, wherein the second side wall panel (102) is configured to form a front wall panel of the package and is foldably connected to a front floor panel (116) and a front top panel (114),

wherein the front floor panel (116) and the front top panel (114) are positioned on opposing transversal sides, as seen in a flat-laid state of the package blank, of the second side wall panel.

5. Package blank (100) according to any one of the previous claims, wherein the set of side wall panels further comprises a fourth side wall panel (105) being configured to form a rear wall panel of the package and being foldably connected to a rear top panel (118) and a rear floor panel (120), wherein the rear floor panel (120) and the rear top panel (118) are positioned on opposing transversal sides, as seen in a flat-laid state of the package blank, of the fourth side wall panel (105).

6. Package blank (100) according to any one of the previous claims, wherein the blank is made of paper-based material.

7. Package blank (100) according to claim 4, wherein the front wall panel comprises a cut-out.

8. Package blank (100) according to any one of the previous claims, wherein each opposing outer side wall panel further comprises a handle cut-out configured to be used as a handle, and wherein each inner side wall top flap (106) preferably also comprises a handle cut-out configured to at least partly coincide with the respective handle cut-out of the respective outer side wall panel.

9. Bobbin (300) configured to receive an elongated product being wound around the bobbin, the bobbin comprising:

two opposing end panels (302),
a central shaft (304) extending along a geometrical axis;
a sleeve blank (400) comprising:

5 a plurality of centre panels (402) being arranged one after the other along a longitudinal direction (L2) and being foldable relative to each other along transversely extending fold lines (403),

10 a plurality of corner panels (404), each corner panel (404) being provided between two neighbouring centre panels (402) at a centre portion, as seen along a transverse direction (T2), of the neighbouring centre panels (402), wherein each corner panel (404) is connected to one of the two neighbouring centre panels (402) along a fold line, and is separated from, or separable from, the other of the two neighbouring centre panels by a cut line, or a perforation,

15 a plurality of end cut-outs (406) being provided in the centre panels at a transversal position outside the corner panels (404), each end cut-out (406) extending across a fold line between neighbouring centre panels (402) and each having an extension in the longitudinal direction (L2),

20 wherein the sleeve blank (400) is configured to be coiled into a bobbin coil (401) by folding the centre panels (402) relative to each other and to be positioned around the central shaft (304), and

wherein each one of the two opposing end panels (302) is provided with a cut-out (502) configured to receive a respective end of the bobbin coil (401).

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10. Bobbin (300) according to claim 9, wherein the respective end of the bobbin coil (401) has a polygonal cross-section formed by transversely outer portions of the centre panels,

30 wherein the cut-out (502) of the respective end panel (302) has a shape being at least partly congruent with the polygonal cross-section such that the respective end of the bobbin coil (401) is insertable into the cut-out of the respective end panel to such an extent that the end panel (302) becomes positioned in register with the end cut-outs (406) and such that the respective

end panel (302) is rotatable an angle about the geometrical axis such that internal edge portions of the end panel (302) enters into slits formed by the end cut-outs (406) at the corners of the polygonal shape of the bobbin coil (401).

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11. Bobbin (300) according to claim 9 or 10, wherein the sleeve blank (400) further comprises

a locking flap (408) being provided at a first longitudinal position and a slit being provided (410) at a second longitudinal position, at a distance from the first longitudinal position, and being configured to receive the locking flap (408) when the sleeve (400) is folded around the central shaft (304).

12. Bobbin (300) according to any one of claims 9-11, wherein the bobbin is made of paper-based material.

13. Package comprising
a package blank (100) according to any one of claims 1- 8 being erected into a package, and
a bobbin (300) according to any one of claims 9-12.

14. Sleeve blank (400) configured to be folded into a bobbin coil, the sleeve blank (400) comprising:

a plurality of centre panels (402) being arranged one after the other along a longitudinal direction (L2) and being foldable relative to each other along transversely extending fold lines,

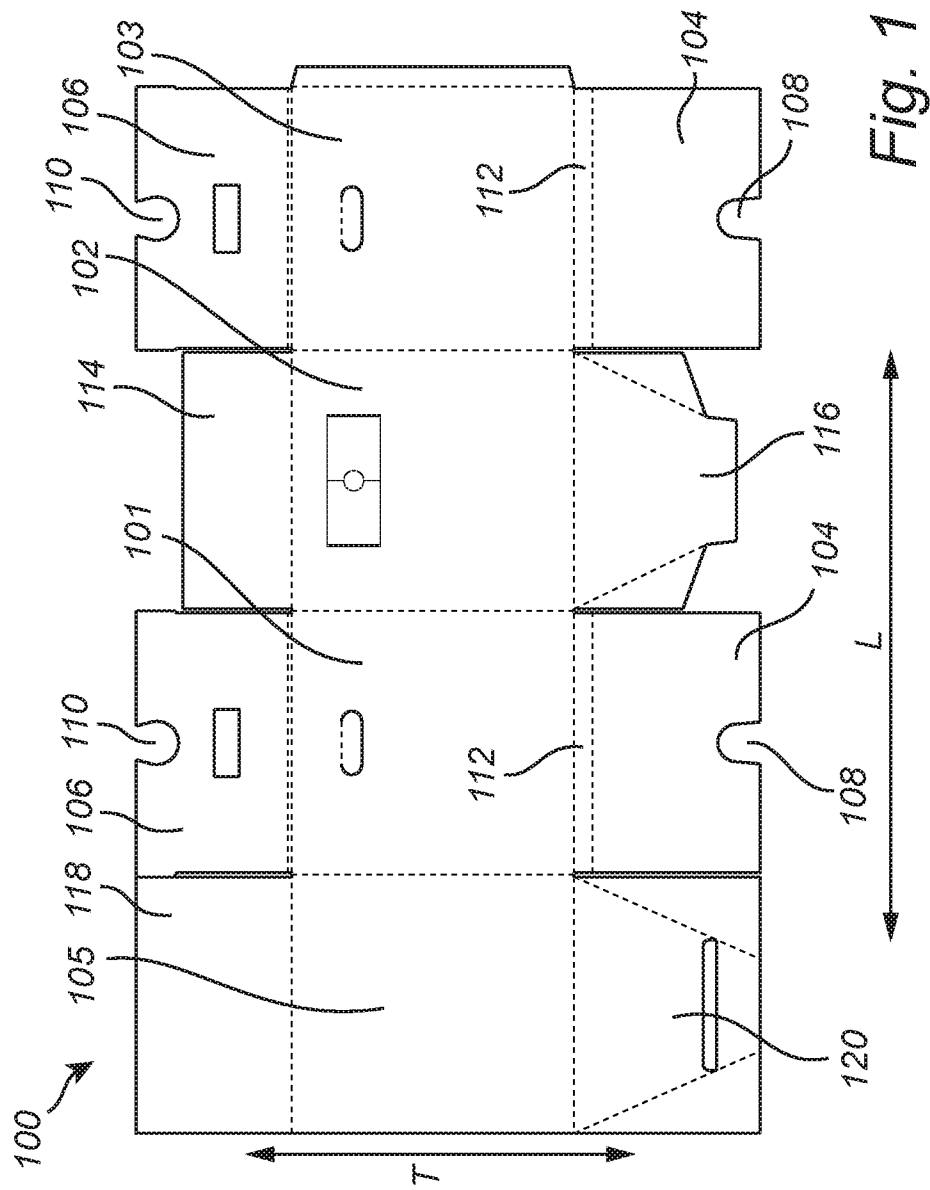
a plurality of corner panels (404), each corner panel (404) being provided between two neighbouring centre panels (402) at a centre portion, as seen along a transverse direction (T2), of the neighbouring centre panels (402), wherein each corner panel (404) is connected to one of the two neighbouring centre panels (402) along a fold line, and is separated from, or separable from, the other of the two neighbouring centre panels by a cut line, or a perforation,

a plurality of end cut-outs (406) being provided in the centre panels at a transversal position outside the corner panels (404), each end cut-out (406) extending across a fold line between neighbouring centre panels (402) and each having an extension in the longitudinal direction (L2),

- 5 wherein the sleeve blank (400) is configured to be coiled into a bobbin coil (401) by folding the centre panels (402) relative to each other.

15. Sleeve blank (400) according to claim 14, further comprising:
a locking flap (408) being provided at a first longitudinal position and
10 a slit being provided (410) at a second longitudinal position, at a distance from the first longitudinal position, and being configured to receive the locking flap (408) when the sleeve (400) is folded around the central shaft (304).

- 15 16. Sleeve blank (400) according to claim 14 or 15, wherein the sleeve blank (400) is made of paper-based material.



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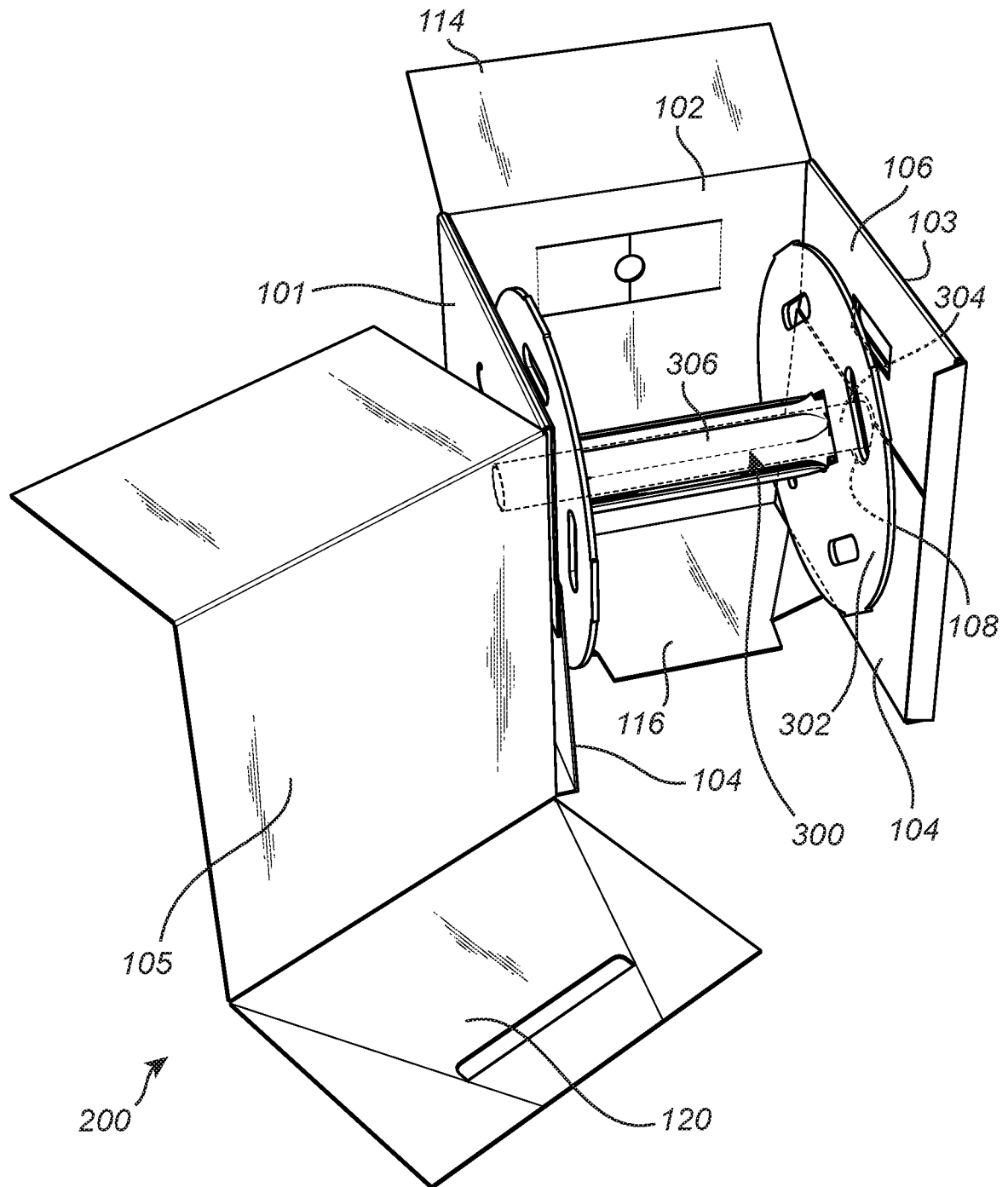
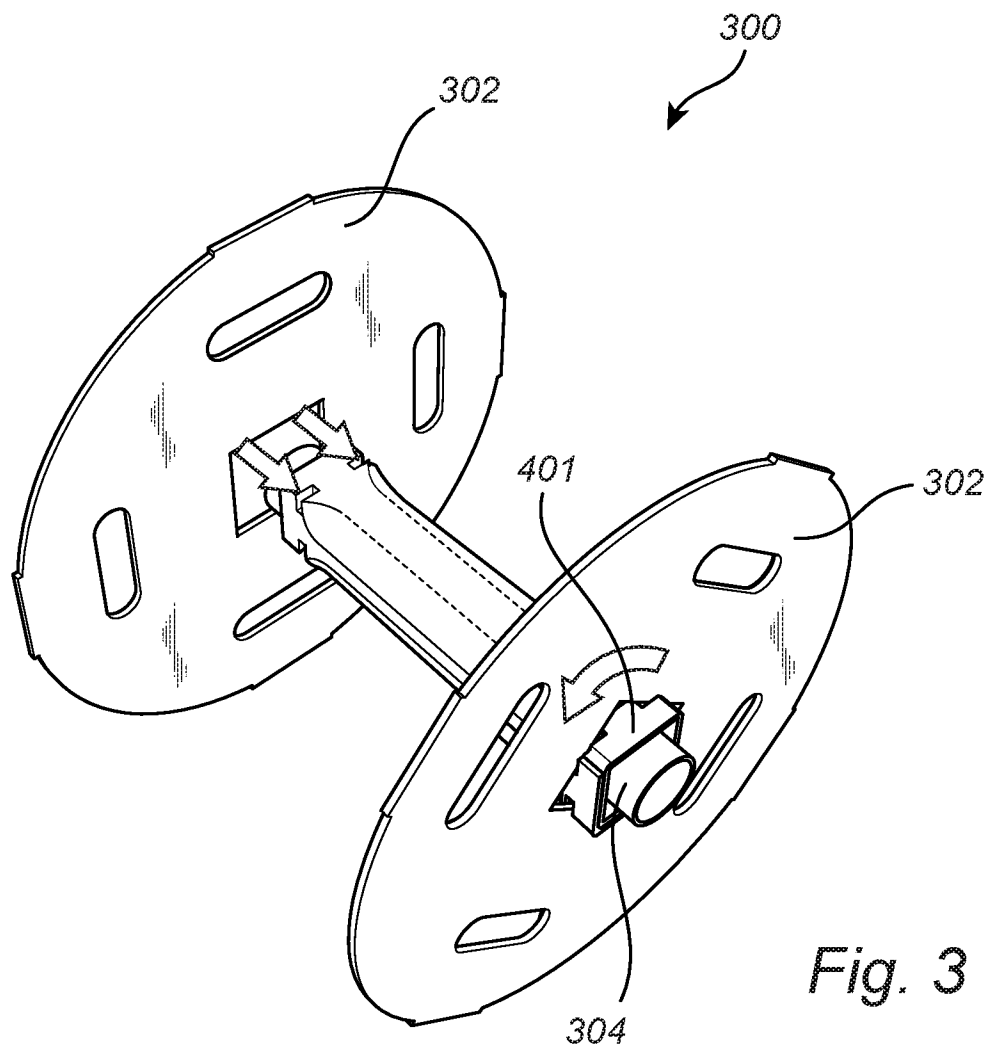
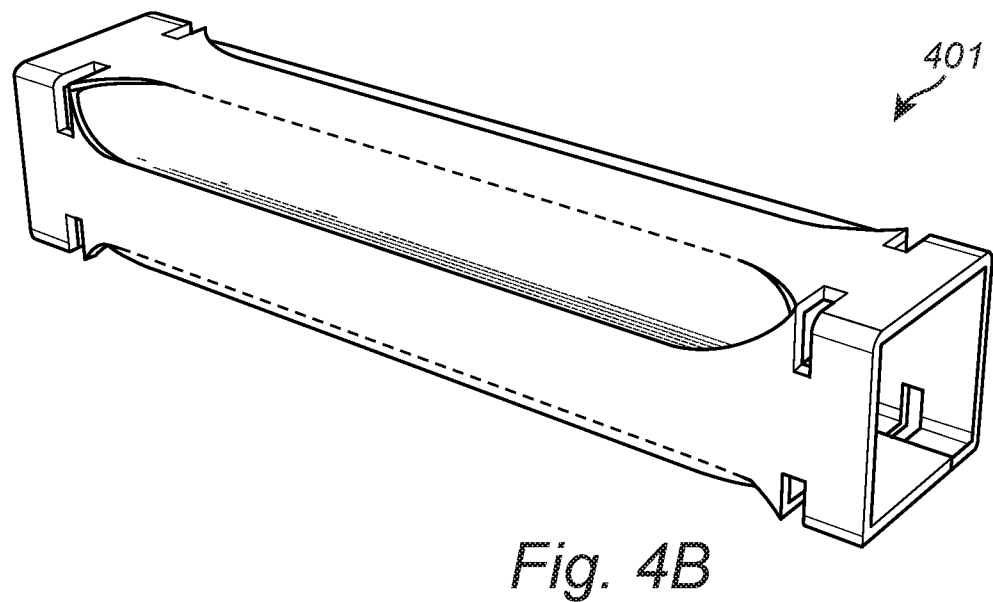
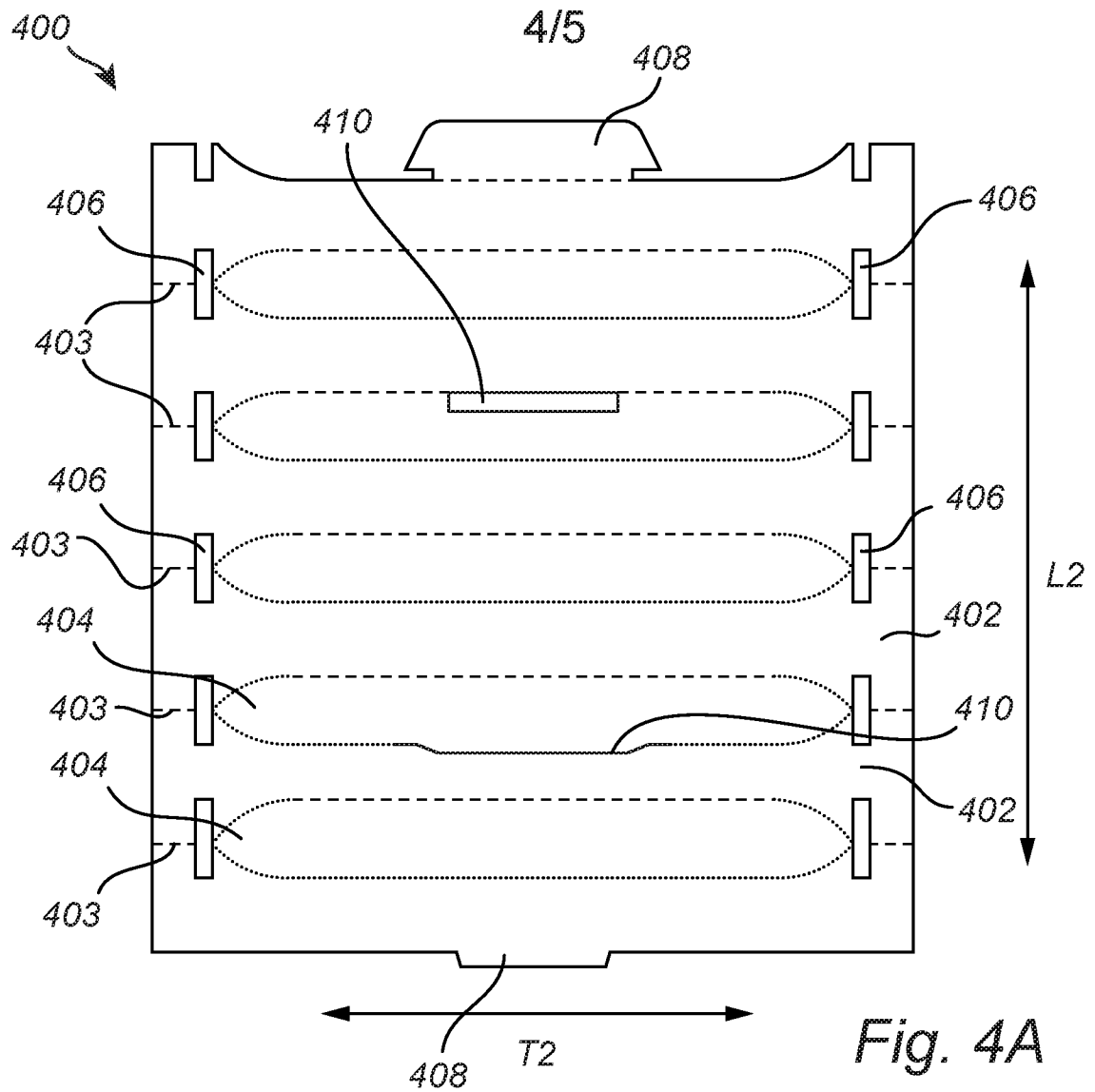


Fig. 2

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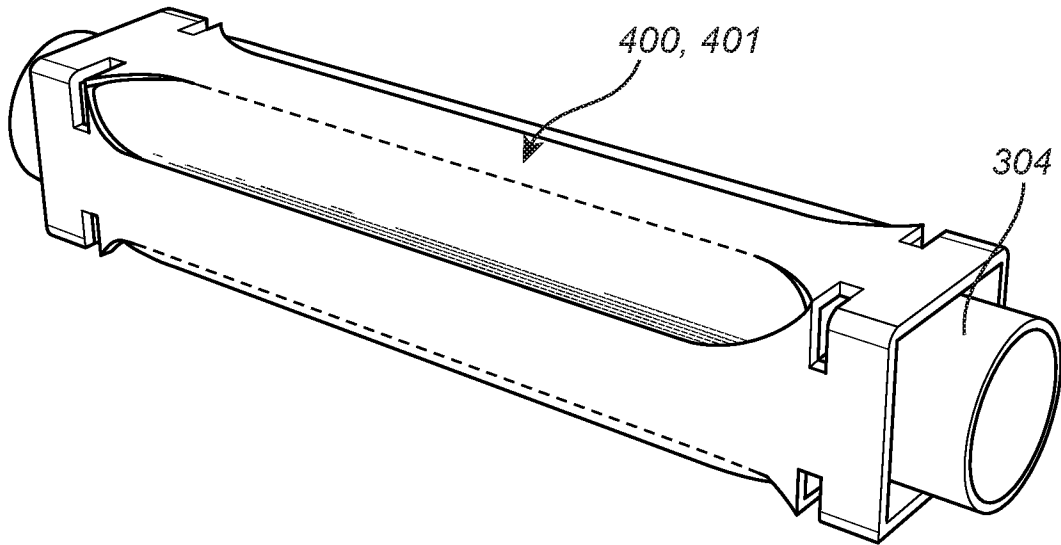


Fig. 4C

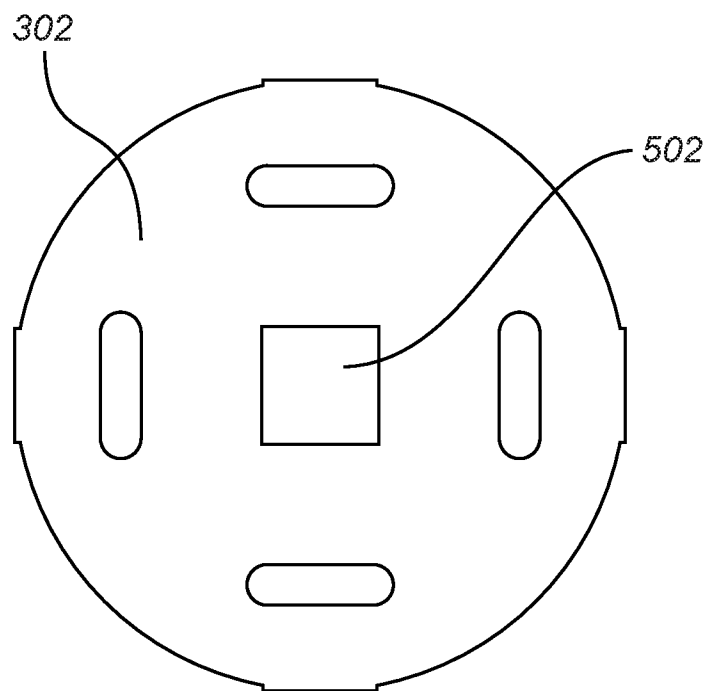


Fig. 5