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(54) **A sewing machine for bags**

(57) Sewing machine for the manufacturing of bags (B1, B2) comprising a strip of fabric (N) sewn along a helical and/or spiral trajectory.

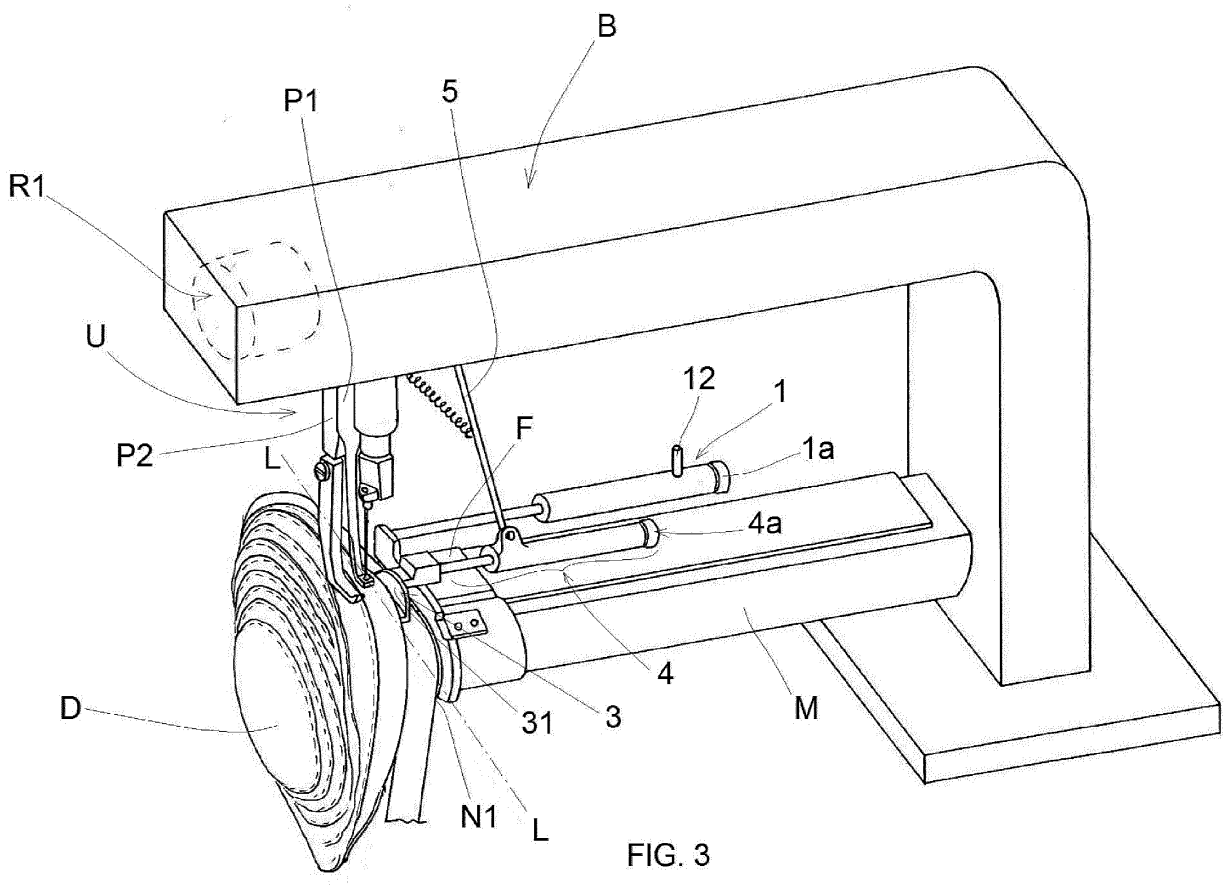

FIG. 3

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Description

[0001] The present patent application for industrial invention relates to a sewing machine for bags, adapted to fabricate a bag starting from a single strip of fabric.

[0002] The machine of the invention has been devised in order to fabricate an innovative bag made of a single strip of fabric that is sewn along an initially spiral trajectory, starting from the center of the bottom of the bag, extending onto the lateral wall along a helical trajectory, and finally ending in the opening of the bag compartment.

[0003] Although the following description refers to a strip of fabric, said strip can be made of leather, imitation leather or any other material.

[0004] The bag is composed of a bottom wall that is connected, mainly by means of seams, to one or more lateral walls that extend up to the main opening of the bag compartment. Although said main opening is normally disposed in opposite position to the bottom wall, the bag may also comprise additional openings to give access to the bag compartment or to small niches provided in the bag.

[0005] While all bags have such a structural configuration, some models of bags - the so-called bucket bags - are provided with a simple structure, similar to a shopping bag, and are characterized by an ogival shape, similar to a bucket.

[0006] The sewing machine of the invention has been devised to fabricate a bucket bag using a strip of fabric that can originate bags with the same structural configuration, but with different dimensions and consequently different capacity, different section, different height, and larger or smaller opening, etc. according to the way in which the strip of fabric is modeled by the operator while sewing the bag.

[0007] US1980856 discloses a sewing machine adapted to automatically sew an item, such as a hat or the like, starting from a strip of the material used to fabricate the item.

[0008] The purpose of the present invention is to devise a sewing machine that, by using the same strip of fabric, can produce an endless number of bags without having to diversify the semi-finished fabrics that are successively sewn together in order to produce bags with different aesthetics.

[0009] The sewing machine of the invention is used to fabricate bags comprising a strip of fabric sewn along a helical and/or spiral trajectory.

[0010] In particular, said sewing machine comprises:

- a shelf with a free end;
- a platform that is disposed at the free end of said shelf;
- an arm that is overlapped and disposed side-by-side to said shelf;

said arm being provided with a free end;

- a sewing unit that is disposed at the free end of said arm; said sewing unit comprising at least one needle and at least one foot; said at least one needle making upward and downward travels along a vertical trajectory;
- an operating sewing station that is disposed in said platform; said operating station being provided with a sewing line passing through said vertical trajectory followed by said at least one needle and directed along a basically perpendicular direction with respect to said shelf;
- a first reel that is disposed at the free end of said arm in correspondence of the sewing unit;
- a second reel that is disposed at the free end of said shelf in correspondence of said operating station.

[0011] The peculiarity of the sewing machine of the invention consists in the fact that it comprises:

- a stop edge in order to guide the strip of fabric in the operating station;
- support means that support the stop edge and are fixed on the shelf;
- adjustment means for said stop edge; said stop edge being adapted to be in idle position, wherein said stop edge is remote with respect to said operating station, and working position, wherein said stop edge is proximal to said operating station; said support means being adapted to move said stop edge between said idle position and said operating position; said adjustment means being adapted to adjust the distance between said at least one needle and said stop edge when said stop edge is in operating position.

[0012] For explanatory reasons the description of the sewing machine for bags according to the present invention continues with reference to the attached drawings, which only have illustrative, not limiting value, wherein:

- Figure 1 is an axonometric view of the sewing machine of the invention.
- Figure 2 is an axonometric view of the sewing machine of the invention during the fabrication of the base portion of a bag;
- Figure 3 is an axonometric view of the sewing machine of the invention during the fabrication of the lateral portion of a bag;
- Figure 4 is an axonometric view of the sewing machine of the invention with the guide means lifted from the operating station;
- Figures 5 and 6 are a front view of two bags fabricated with the sewing machine of the invention.

[0013] Referring to Fig. 1 the sewing machine for bags of the present invention comprises a shelf (M), the end of which is provided with a platform (F) where the sewing operating station (SO) is disposed.

[0014] Said machine also comprises an arm (B) that is overlapped and disposed side-by-side to said shelf (M) and provided at its free end with a sewing unit (U) that comprises at least one needle (A) and at least one foot (P1, P2).

[0015] In this case two feet are provided, of which an internal foot (P1) in adjacent position to the needle (A), and an external foot (P2); said internal foot (P1) being disposed in aligned intermediate position with respect to the needle (A) and the external foot (P2).

[0016] Additionally, said machine comprises a first reel (R1) that is disposed at the free end of said arm (B), and a second reel (R2) that is disposed at the free end of the shelf (M) in correspondence of the operating station (SO).

[0017] Said operating station (SO) comprises a sewing line (L) passing along the vertical trajectory covered by the needle (A) during its rising and descending travels and directed along a basically perpendicular direction with respect to the shelf (M).

[0018] The following parts are disposed above the shelf (M):

- a stop edge (2) adapted to guide a strip of fabric (N) in the operating station (SO); said stop edge (2) being adapted to be in idle position, wherein said stop edge (2) is remote with respect to the operating station (SO), and in operating position, wherein said stop edge (2) is in proximal position to said operating station (SO);
- support means (1) for said stop edge (2), which support said stop edge (2) and are fixed above the shelf (M);
- adjustment means (1 a) for said stop edge (2).

[0019] In this case said support means (1) move the stop edge (2) between the idle position and the operating position, whereas the adjustment means (1 a) adjust the distance between the needle (A) and the stop edge (2), when the latter is in operating position; said distance must be selected according to the width of the strip of fabric (N) used to fabricate the bag.

[0020] Said support means (1) comprise an actuator that is fixed above the shelf (M) and comprises a stem (11) with a free end that support said stop edge (2).

[0021] Now referring to Fig. 4, the stop edge (2) has two sides (21, 22), of which a first side (21) facing towards the stem (11), to which it is fixed, and a second side (22) facing towards the operating station (SO).

[0022] Said stop edge (2) is also provided with a lower side in adjacent position to the platform (F).

[0023] Said actuator comprises a button (12) adapted to actuate fast actuation means (not shown in the attached figures) that rapidly move the stem (11) from a retracted position to an extracted position.

[0024] Referring to Figs. 1 to 4, the sewing machine also comprises guide means (3) adapted to be in a non-operating position, wherein they are not disposed in the operating station (SO), and an operating position, wherein they are disposed in the operating station (SO).

[0025] Said guide means (3) are adapted to be disposed above the portion of strip (N) that momentarily runs in the operating station (SO); said strip (N) being disposed between the platform (F) and said guide means (3), as shown in Fig. 2.

[0026] More precisely, when they are in operating position, said guide means (3) are close to the sewing line (L) and disposed upstream the needle (A).

[0027] Said guide means (3) are supported by a horizontal rod (4) that comprises adjustment means (4a) adapted to adjust the distance between said guide means (3) and the needle (A).

[0028] Said horizontal rod (4) is fixed at the free end of an oscillating arm (5) that is fixed under the arm (B) of the sewing machine of the invention, as shown in Figs. 1 to 4.

[0029] Referring to Figs. 3 and 4, the oscillating arm (5) can be lifted in order to lift the guide means (3) when the operator must carry out operations directly in the operating station (SO) (for example, to replace the needle or one of the two reels), during which said guide means (3) are a hindrance.

[0030] Said guide means (3) comprise an L-shaped plate (31, 32) that comprises a vertical portion (31) and a horizontal portion (32), wherein:

- the vertical portion (31) is connected to said horizontal rod (4) and is provided with a first side, facing towards the operating station (SO), and a second side, facing towards the opposite side, whereon said horizontal rod (4) is connected; said vertical portion (31) being disposed between the sewing line (L) and the stop edge (2), as shown in Fig. 1;
- the horizontal portion (32) has an upper surface and a lower surface, which is interfaced with the shelf (M); said horizontal portion (32) being close to the sewing line (L).

[0031] The description continues with reference to the operating mode of the sewing machine of the invention.

[0032] Reference is made to Figs. 5 and 6, which illustrate two bags (B1, B2) fabricated with the machine of the invention, using the same strip of fabric (N).

[0033] Said bags comprise a base portion (PB), a connection portion (PR) and a lateral portion (PL), wherein:

- the base portion (PB) is fabricated from a disk (D) whereon the strip of fabric (N) is sewn according to a spiral trajectory;
- the connection portion (PR) is the portion that connects the base portion (PB) to the lateral portion (PL) and is fabricated by sewing the strip of fabric (N) along a trajectory that changes from spiral to helical;
- the lateral portion (PL) is fabricated by sewing the strip of fabric (N) along a basically helical trajectory.

[0034] The fabrication of a bag (B1, B2) with the sewing

machine of the invention provides for fabricating the base portion (PB) of the bag (B1, B2) first, using a disk (D) on the perimeter of which the strip of fabric (N) is fixed, and then sewn along a spiral trajectory in order to progressively increase the diameter of said base portion (PB).

[0035] Referring to Fig. 2, the strip of fabric (N) is disposed along the sewing line (L) on the platform (F) and pressed against it by the lower side of the horizontal portion (32) of the plate (31, 32).

[0036] The strip of fabric (N) has a first lateral border (N1) and a second lateral border (N2), wherein the first lateral border (N1) runs against the stop edge (2), whereas the second lateral border is initially sewn to the disk (D).

[0037] As soon as the sewing machine is actuated, the operator starts rotating the disk (D), while keeping it in horizontal position.

[0038] As shown in Fig. 2, when the disk (D) has made one complete rotation, the strip of fabric (N) that is running in the operating station (SO) is sewn to the strip of fabric (N) that is the base portion (PB) of the bag (B1, B2) being fabricated; more precisely, the second lateral border (N2) of the strip of fabric (N) that runs in said operating station (SO) is sewn with the first lateral border (N1) of the strip of fabric (N) that is the base portion of the (PB) bag (B1, B2).

[0039] It must be noted that the first lateral border (N1) of the strip of fabric (N) that forms the bag (B1, B2) runs onto the horizontal portion (32) of the plate (31, 32) against the vertical portion (31) of the plate (31, 32).

[0040] As shown in Fig. 4, the platform (F) is provided, upstream the operating station (SO), with an inlet slide (S) that, when cut along the sewing line (L), develops along one fourth of circumference and ends with a downward-facing border.

[0041] Said inlet slide (S) supports and guides the strip of fabric (N) towards the operating station (SO), making it pass from a vertical position to a horizontal position.

[0042] It must be noted that said inlet slide (S) extends for the entire length of the platform (F) and said stop edge (2) is suitably provided with a curved extension (2a) shaped in such manner to perfectly adhere onto the inlet slide (S).

[0043] After a first step that provides for fabricating the base portion (PB) of the bag (B1, B2) by rotating the disk (D) along a vertical axis, a second step is started, wherein the disk (D) starts rotating along an inclined axis, and finally a third step is started, wherein the disk (D) rotates along a horizontal axis.

[0044] According to the length of said steps and to the number of times the disk (D) is rotated during said three steps, the finished bag (B1, B2) will have a different configuration, namely:

- the higher the length of the first step is, the higher the width of the base portion (PB) of the bag (B1, B2) will be;
- the higher the length of the second step is, the higher the connection portion (PR) of the bag (B1, B2) will be;
- the higher the length of the third step is, the higher the lateral portion (PL) of the bag (B1, B2) will be.

[0045] In particular, the fabrication process of the bag (B1, B2) with the sewing machine of the invention comprises the following steps:

a) positioning the strip of fabric (N) along the sewing line (L) on the platform (F);
b) lowering the plate (31,32) in such manner that the lower side of its horizontal portion (32) presses the strip of fabric (N) against said platform (F);
c) preparing the disk (D) and positioning it in contact with one of the two lateral borders of the strip of fabric (N);
d) operating the sewing machine in order to sew the lateral border of the strip (N) along the lateral border of the disk (D);
e) rotating the disk (D) around a vertical axis of rotation in such manner that the strip (N) is sewn to the disk (D) along a spiral trajectory;
f) gradually tilting the axis of rotation of the disk (D) in such manner that the sewing trajectory of the strip (N) to the disk (D) gradually changes from spiral to helical;
g) stopping the axis of rotation of the disk (D) in proximal position to the horizontal axis, in such manner that the sewing trajectory of the strip (N) to the disk (D) is a helical trajectory.

[0046] Referring to Figs. 1 and 4, the platform (F) has an extension (F1) along the direction of the shelf (M), which extends beyond the second foot (P2) and is fundamental in order to allow for disposing the base portion (PB) and/or the connection portion (PR) and/or the lateral portion (PL) of the bag (B1, B2) in the correct position while sewing the strip of fabric (N).

Claims

1. Sewing machine for bags comprising a strip (N) sewn according to a helical and/or spiral trajectory, comprising:

- a shelf (M) with a free end;
- a platform (F) that is disposed at the free end of said shelf (M);
- an arm (B) that is overlapped and disposed side-by-side to said shelf (M); said arm (B) being provided with a free end;
- a sewing unit (U) that is disposed at the free end of said arm (B); said sewing unit (U) comprising at least one needle (A) and at least one foot (P1, P2); said at least one needle (A) making upward and downward travels along a vertical

trajectory;
- an operating sewing station (SO) that is disposed in said platform (F); said operating station (SO) being provided with a sewing line (L) that passes through said vertical trajectory covered by said at least one needle (A) and directed along a basically perpendicular direction with respect to said shelf (M);
- a first reel (R1) that is disposed at the free end of said arm (B) in correspondence of the sewing unit (U);
- a second reel (R2) that is disposed at the free end of said shelf (M) in correspondence of said operating station (SO);
sewing machine **characterized in that** it comprises:
- a stop edge (2) in order to guide the strip (N) in the operating station (SO);
- support means (1) that support the stop edge (2) and are fixed above the shelf (M);
- adjustment means (1 a) for said stop edge (2); said stop edge (2) being adapted to be in idle position, wherein said stop edge (2) is remote with respect to said operating station (SO), and in working position, wherein said stop edge (2) is proximal to said operating station (SO); said support means (1) being adapted to move said stop edge (2) between said idle position and said operating position; said adjustment means (1a) being adapted to adjust the distance between said at least one needle (A) and said stop edge (2) when said stop edge (2) is in operating position.

2. The sewing machine of claim 1, wherein said support means (1) for said stop edge (2) comprise an actuator, which is fixed on the shelf (M) and comprises a stem (11); said stem (11) being provided with a free end that supports said stop edge (2) and said stem (11) being adapted to be in retracted position and extracted position with respect to said piston; said stop edge (2) comprising a first side (21) facing towards the stem (11), a second side (22) facing towards said operating station (SO), and a lower side in adjacent position to the platform (F).

3. The sewing machine of claim 2, wherein said actuator comprises a button (12) that actuates fast actuation means to move the stem (11) of said actuator from retracted position to extracted position.

4. The sewing machine of any one of the preceding claims, comprising guide means (3) adapted to guide the running of the strip (N) in the operating station (SO); said strip (N) being disposed between said platform (F) and said guide means (3).

5. The sewing machine of claim 4, comprising a horizontal rod (4) to support said guide means (3), and an oscillating arm (5) provided with a free end fixed to said horizontal rod (4); said oscillating arm (5) being fixed in lower position with respect to said arm (B); said guide means (3) being adapted to be in non-operating position, wherein said guide means (3) are not disposed in said operating station (SO), and an operating position, wherein said guide means (3) are disposed in said operating station (SO) close to said sewing line and upstream said at least one needle (A).

6. The sewing machine of claim 5, wherein said horizontal rod (4) comprises adjustment means (4a) adapted to adjust the distance between said guide means (3) and said at least one needle (A) when said guide means are in operating position.

7. The sewing machine of any one of claims 4 to 6, wherein said guide means (3) comprise an L-shaped plate (31, 32), which comprises a vertical portion (31) and a horizontal portion (32); said vertical portion (31) of said L-shaped plate (31, 32) being connected to said horizontal rod (4) and provided with a first side facing towards said operating station (SO), and a second side facing towards the opposite side; said vertical portion (31) of said L-shaped plate (31, 32) being disposed between the sewing line (L) and the stop edge (2); said horizontal portion (32) being provided with an upper surface and a lower surface, which is interfaced with said shelf (M); said horizontal portion (32) being close to the sewing line (L).

8. The sewing machine of any one of the preceding claims, comprising an inlet slide (S) that is disposed upstream the operating station (SO) (with respect to the forward traveling direction of the strip (N) inside the operating station (SO)), is cut along a sewing line (L) and is developed along one fourth of circumference, ending with a downward-facing border; said inlet slide (S) extending for the entire length of the platform (F).

9. The sewing machine of the preceding claim, wherein said stop edge (2) comprises a curved extension (2a) that is suitably shaped in order to adhere on said inlet slide (S).

10. The sewing machine of any one of the preceding claims, comprising an extension (F1) of said platform (F), which extends along the direction of the shelf (M), in addition to said at least one foot (P1, P2).

11. Fabrication process of a bag (B1, B2) with the sewing machine of any one of claims 1 to 10; said process comprising the following steps:

a) positioning the strip (N) along the sewing line

(L) on the platform (F);
b) lowering the plate (31,32) in such manner that the lower side of its horizontal portion (32) presses the strip (N) against said platform (F);
c) preparing a disk (D) and positioning it in contact with a lateral border of the strip (N);
d) operating the sewing machine in order to sew the lateral border of the strip (N) along the lateral border of the disk (D);
e) rotating the disk (D) around a vertical axis of rotation in such manner that the strip (N) is sewn to the disk (D) along a spiral trajectory;
f) gradually tilting the axis of rotation of the disk (D) in such manner that the sewing trajectory of the strip (N) to the disk (D) gradually changes from spiral to helical;
g) stopping the axis of rotation of the disk (D) in proximal position to the horizontal axis, in such manner that the sewing trajectory of the strip (N) to the disk (D) is a helical trajectory.

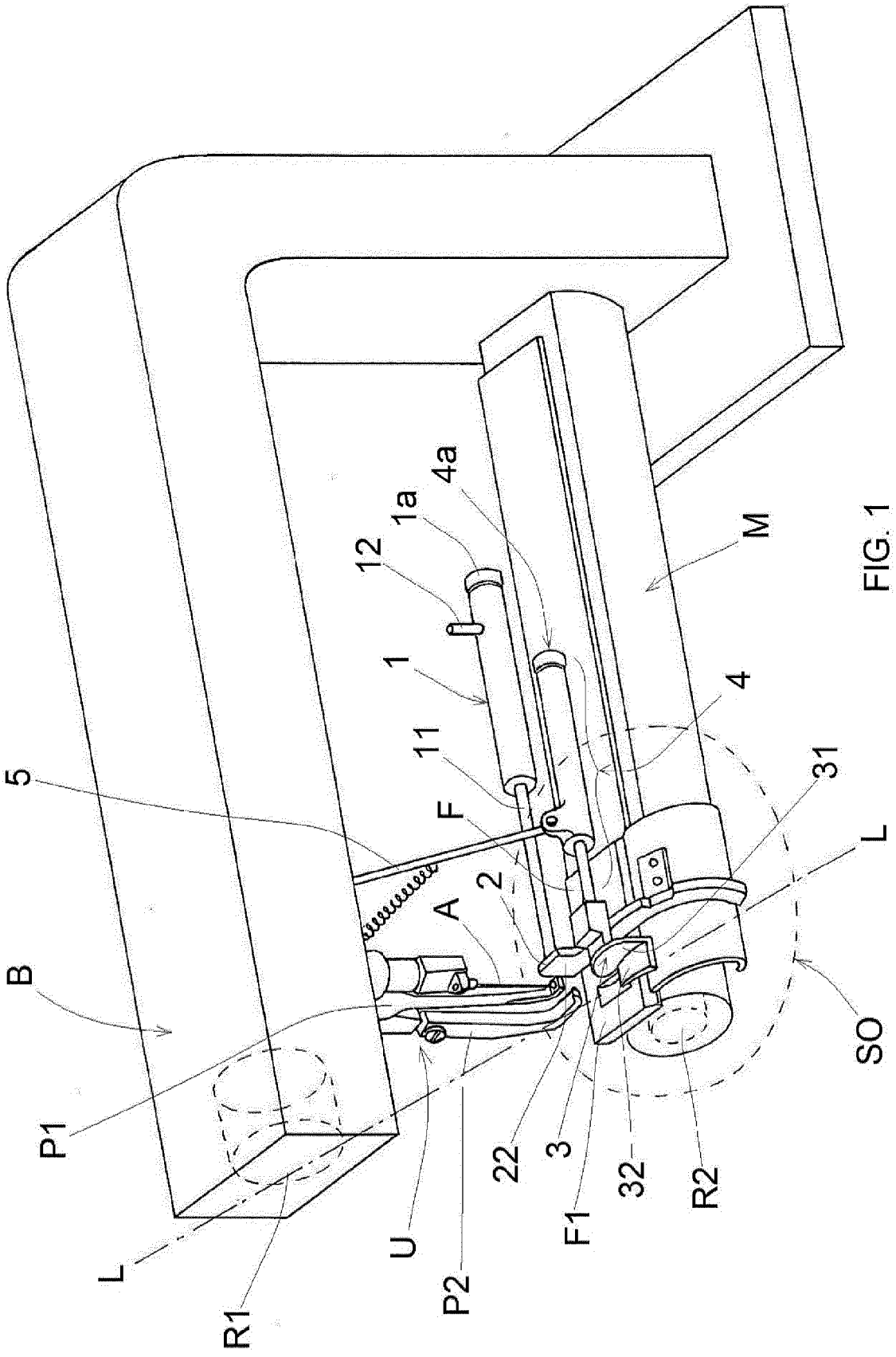

FIG. 1

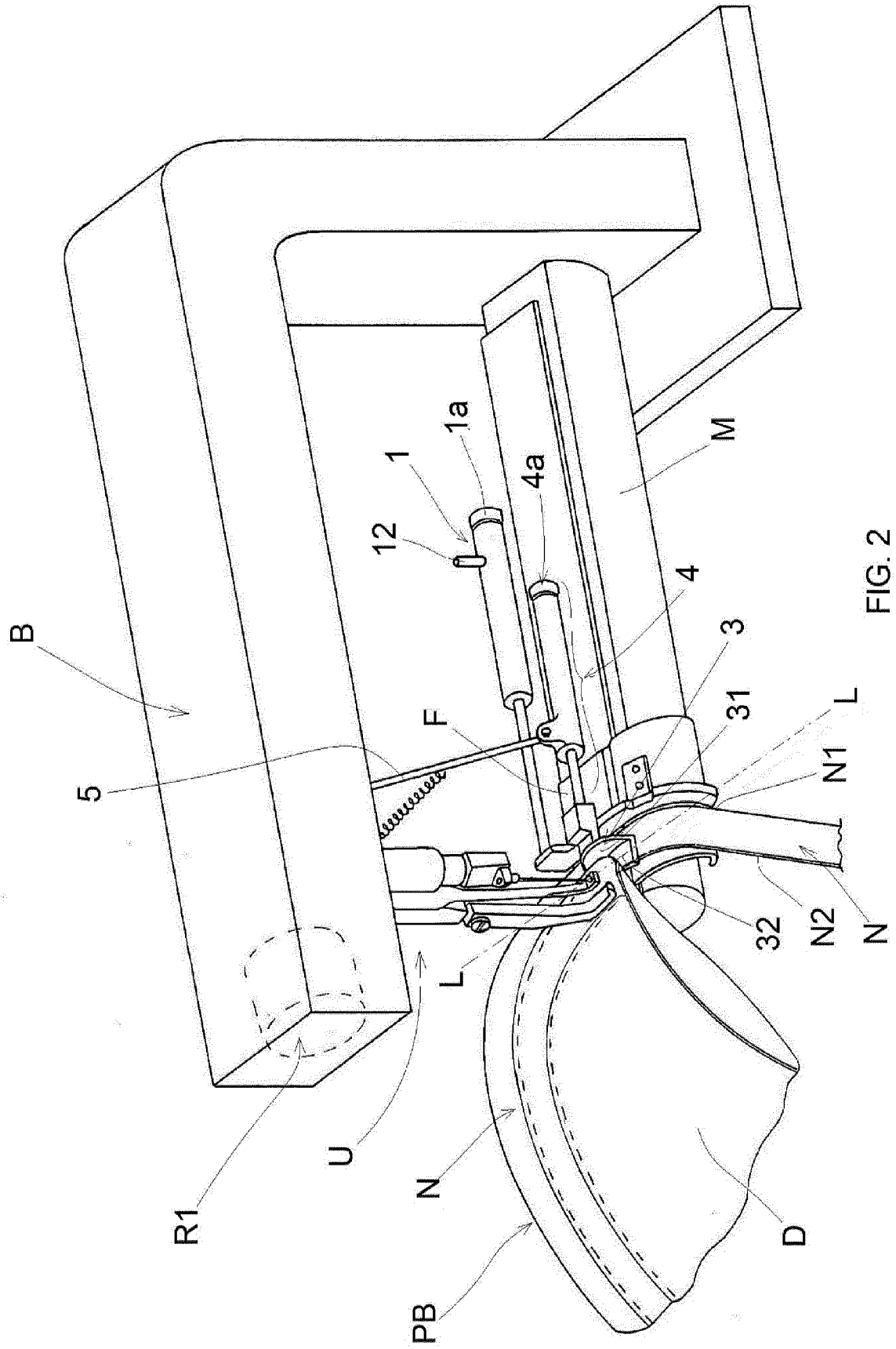

FIG. 2

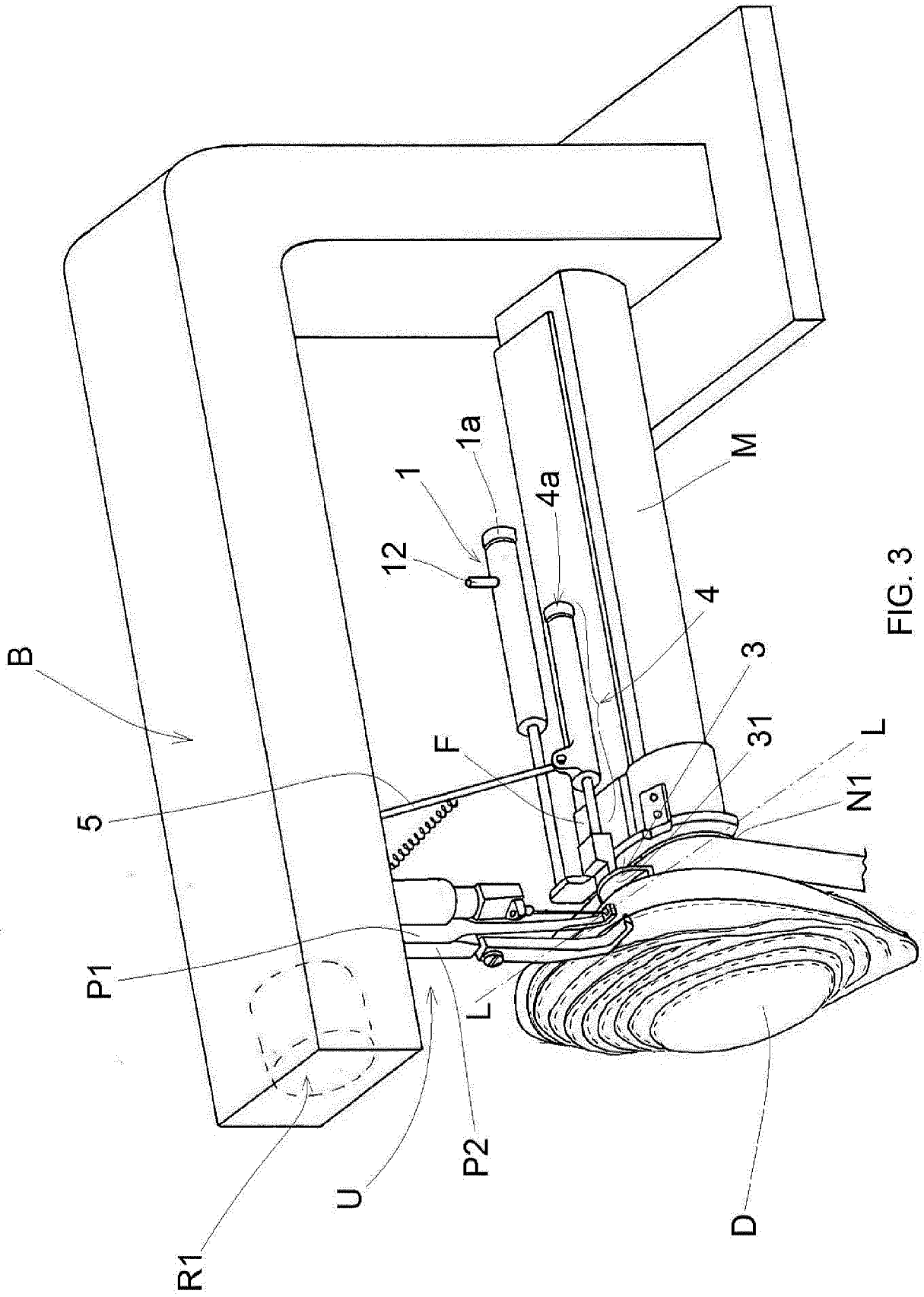

FIG. 3

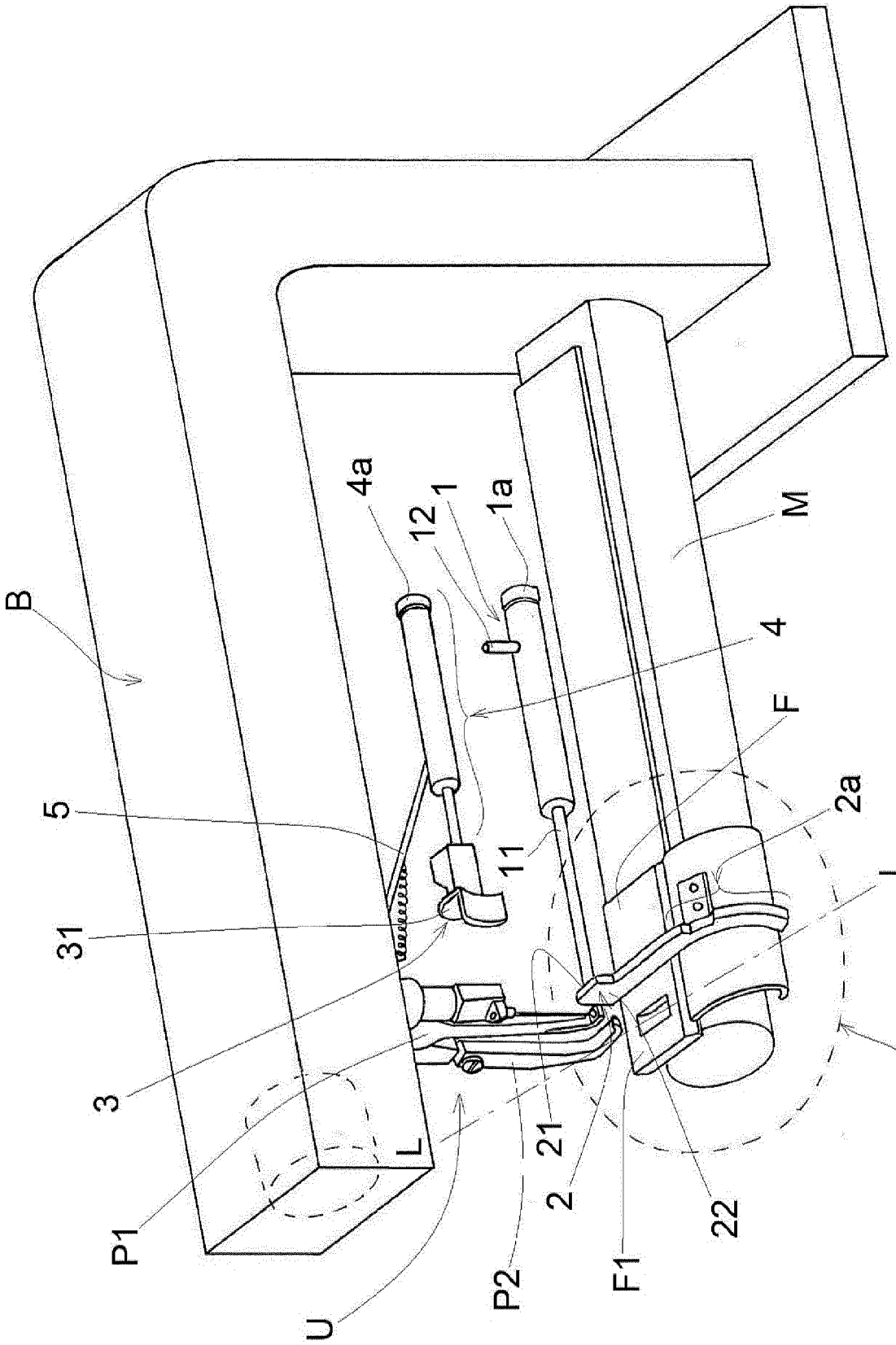

FIG. 4

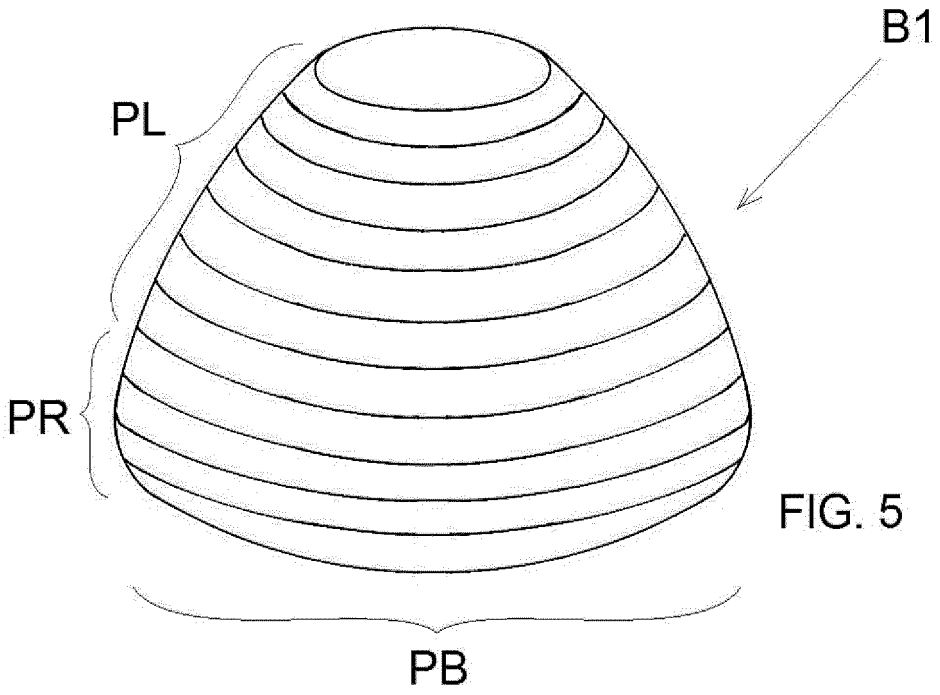

FIG. 5

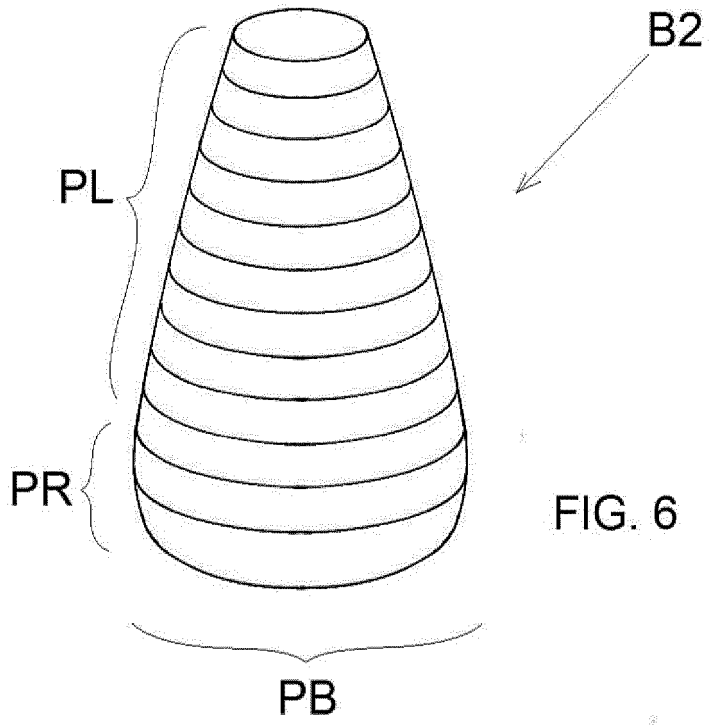

FIG. 6

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EUROPEAN SEARCH REPORT

Application Number
EP 14 16 7171

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
Y	DE 703 034 C (JOHANN JANNACH) 26 February 1941 (1941-02-26)	11	INV. D05B23/00
A	* page 2, line 60 - page 4, line 28; figures 1-12 *	1-10	
Y	US 1 980 856 A (HARRY FUCHS) 13 November 1934 (1934-11-13)	11	
A	* page 1, line 43 - page 2, line 133; figures 1-4 *	1-10	
A	GB 771 360 A (GORDONIA BRASSIERE MFG CO LTD; ROLAND THOMAS JACKSON) 3 April 1957 (1957-04-03) * page 1, line 78 - page 2, line 21; figures 1-3 *	1-11	
A	US 1 613 860 A (SAMUEL WECHSLER) 11 January 1927 (1927-01-11) * page 1, line 39 - page 2, line 45; figures 1-6 *	1-11	
A	US 2 320 271 A (EVERITT DAVID C) 25 May 1943 (1943-05-25) * page 1, line 20 - page 2, line 66; figures 1-6 *	1-11	TECHNICAL FIELDS SEARCHED (IPC) D05B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	18 June 2014	Herry-Martin, D

CATEGORY OF CITED DOCUMENTS

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18-06-2014

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

REFERENCES CITED IN THE DESCRIPTION

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