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(54) **SPORTS EQUIPMENT FOR THE PRACTICE OF SKI MOUNTAINEERING**

(57) Sports equipment comprising a ski (1) and a lift group (G); the ski (1) comprises a longitudinal axis (Z), a tip (11), a tail (12), two lateral edges (13) and a bridge-like structure (15), arranged between the tail (12) and the tip (11), above the ski (1); the bridge-like structure (15) comprises a hooking surface (15a) for bindings (AT) of a user's boot and defining, on a lower side, a duct (16); said lift group (G) comprising an engine unit (M) comprising a motor (2) and a drum (4) moved by the motor (2), a management and control unit (U) connected to the motor (2), a first roller (51) arranged on the tip (11) of the ski (1), a second roller (52) arranged on the tail (12) of the ski (1) and a belt (6) closed on itself and wound longitudinally around the ski under a condition for which it slides around the two rollers (51, 52), being dragged in rotation by the above-mentioned drum (4) and being slidably inserted on the duct (16); the belt (6) is equipped with a rib sliding in a groove of the ski (1).

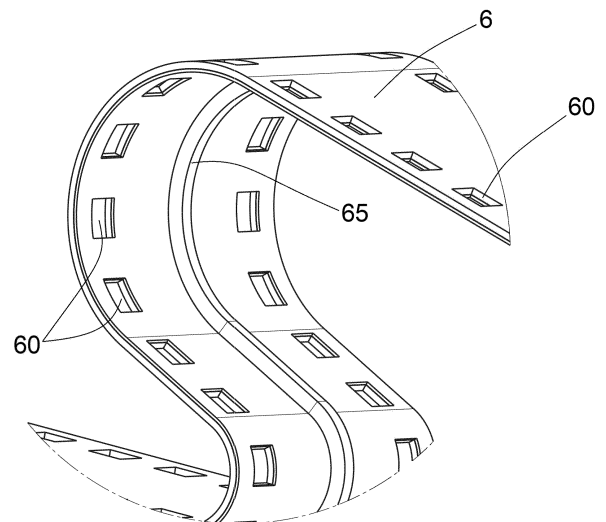


FIG. 12

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## Description

**[0001]** The present patent application for industrial invention relates to a piece of sports equipment for the practice of ski mountaineering. As it is known, ski mountaineering is a sport discipline which is practiced in the mountains during snow periods outside the equipped slopes and then without being able to count on the availability of typical ski lifts.

**[0002]** This involves the fact that practitioners are forced to climb the slopes having skis on their feet with their own forces, before being able to undertake the subsequent descents.

**[0003]** Such need implies that the practitioners use special skis, the insoles thereof result to be coated with seal skins capable of guaranteeing that the ski moves forward and grips uphill.

**[0004]** The current seal skins are of synthetic nature and adopt a first adhesive face, capable of fixing removably to the ski insole, and a second face coated with an oriented textile fibre suitable to interfere with the snow cover.

**[0005]** The latter, in fact, allows the ski to slide forward only, in the climbing direction, however without being able to slide backward.

**[0006]** However, the current seal skins, even if they are effective, are not free from significant drawbacks.

**[0007]** The main drawback of the seal skin derives from its tendency to promote the formation of a layer of consolidated snow below the ski, so as to limit the sliding capability of the latter and to make the user's ascent particularly difficult, even due to the weight increase which thus determines on the ski.

**[0008]** To this it is added that the seal skin can keep its desired functionality only if it is subjected periodically to an accurate and delicate maintenance, above all meant as a surface cleaning.

**[0009]** Not to mention, finally, that a pair of skis equipped with the above-mentioned seal skins is not suitable to be used, with the purpose of allowing to climb a snowy slope, by any potentially interested user, but only by expert users, apart from being provided in the lower limbs with a considerable muscle power, in absence of which, however, it is not possible to climb a slope since the inevitable resistance to the forward motion, offered by the snow surface, has to be overcome.

**[0010]** Precisely the critical evaluation of such drawbacks led to devise a new piece of sports equipment at issue which, actually, appears as a valid alternative to a traditional pair of skis equipped with seal skins.

**[0011]** A specific object of this invention, in fact, is to allow the user engaged in the ski mountaineering to climb a snow slope in complete safety, with a limited physical effort, that is with partial assistance, allowing even not particularly trained subjects to perform the practice of ski mountaineering.

**[0012]** Such purpose has been achieved by providing to mount on a ski, traditional on itself, a motorized belt

capable of rotating continuously with respect to said ski like a track of an agricultural tractor, wherein it is provided that said belt, preferably at the surface intended to come in contact with the snow cover, adopts a finishing like a seal skin and thus provided with the same functional prerogatives.

**[0013]** The above-mentioned object is achieved according to the invention with the features listed in the enclosed independent claim 1.

**[0014]** Advantageous embodiments appear from the depending claims.

**[0015]** For greater explanatory clarity the invention description continues with reference to the enclosed drawing tables, having only illustrative and not limiting value, wherein:

- figure 1 is a back axonometric representation of the new equipment at issue;
- figure 2 is a front axonometric representation of the equipment of figure 1;
- figure 3 is a top view of the equipment of figure 1;
- figure 4 is a lateral view of the equipment of figure 1;
- figure 5 is analogous to figure 4, with the removed carters of the operating components of said equipment;
- figure 6 shows an enlarged detail of the rear end of the equipment at issue;
- figure 7 shows the rear end of the equipment at issue with the respective battery extracted from its operating position;
- figure 8 shows an enlargement of the engine unit of the equipment at issue;
- figure 9 shows the above-mentioned engine unit with a partially exploded drawing;
- figures 10 and 11 are enlargements of the ski belt illustrating in particular the connection means of the belt end; in figure 10 the connection means is uncoupled whereas in figure 11 the connection means is coupled;
- figure 12 is an enlargement of the ski belt illustrating an internal face of the belt.

**[0016]** In the present document, the measurements, values, shapes and geometrical references (such as perpendicularity and parallelism), when associated to words such as "about" or other similar terms such as "approximately" or "substantially", are to be meant as excluding measurement errors or inaccuracies due to production and/or manufacturing errors and, above all, excluding a slight deviation from the value, measurement, shape or geometrical reference thereto it is associated. For examples, such terms, if associated to a value, preferably designate a divergence not higher than 10% of the value itself.

**[0017]** Moreover, when used, terms such as "first", "second", "higher", "lower", "main" and "secondary" do not identify necessarily an order, a relation priority or relative position, but they can be simply used to distinguish

more clearly components different from each other.

**[0018]** Unless otherwise designated, "perpendicular", "transversal", "parallel" or "normal" or other terms of geometric positioning between geometric elements (for example axes, directions and straight lines) are to be meant with reference to their mutual geometric position between the corresponding projections. Said projections are defined on one single plane parallel to the one(s) in which said geometric elements lie.

**[0019]** The measurements and data reported in the present text are to be considered, unless otherwise indicated, as performed under International Standard Atmosphere ICAO (ISO 2533:1975).

**[0020]** Unless otherwise specified, as it results from the following discussions, it is considered that terms such as "treatment", "computer science", "determination", "calculation", or the like, relate to the action and/or processes of a computer or similar electronic calculation device which manipulates and/or transforms data represented as physical data, such as electronic quantities of registers of a computer system and/or memories into other data similarly represented as physical quantities within computer systems, registers or other devices for storing, transmitting or displaying information.

**[0021]** With reference to such figures, the sports equipment at issue has two main components, the first thereof consists in a ski (1) adopting, in its general lines, a conventional structure comprising a tip (11), a tail (12) and two lateral edges (13) substantially parallel to the longitudinal axis (Z) of the ski (1) itself.

**[0022]** The sports equipment defines a "use" condition when it is worn by the user and it is in contact with a ground such as a suitably uphill and/or downhill surface covered by snow.

**[0023]** The peculiarity of this ski (1) consists in the fact of adopting on the upper portion a bridge-like structure (15) which results to be positioned between the tail (12) and the tip (11).

**[0024]** Said bridge-like structure (15) constitutes the hooking surface (15a) for the bindings (AT) of a boot and it is useful to delimit, in combination with the underlying surface of the ski (1), a duct (16) developed according to the above-mentioned longitudinal axis (Z) of the ski (1).

**[0025]** With reference to Figures 3, 4 and 5, the second component of the sports equipment according to the invention consists in a lift group (G) which results to be connected to the above-mentioned ski (1) and which comprises a track comprising a motorized belt (6) which rotates in closed circuit around the ski (1), so as to operate like a track. The belt (6) is configured to come in contact with the ground as replacement of the ski (1).

**[0026]** The belt (6) is closed on itself and it is wound longitudinally around the ski (1) suitably defining a surface proximal to the ski (1) and one distal from the ski (1) configured to come in contact with the ground.

**[0027]** The structure of the ski (1) can be like a sandwich. In particular, the ski (1) comprises an upper layer suitably proximal to the bindings (AT) and a lower layer

mutually coupled defining the structure of the ski (1). More in detail it comprises one or more intermediate layers interposed between upper and lower layer.

**[0028]** The lower layer is configured to arrange in use near the ground. It can be identified in the insole. Then, it defines the lower surface of the ski (1).

**[0029]** Said layers can be made of one or more materials selected among polymeric material, resin, metal material (for example titanium), composite material (for example carbon fibre) or wood.

**[0030]** The ski (1) can include at least a lamina extending at least in part and in detail for the entirety of the ski along the longitudinal direction (Z).

**[0031]** It extends suitably for at least the central portion of said ski (1).

**[0032]** The lamina can define a lateral edge of at least the lower layer and, in some cases, of the ski (1) in use facing and in detail in contact with the ground.

**[0033]** Preferably the ski (1) comprises two laminae each one thereof placed at a lateral edge of least the lower layer.

**[0034]** The belt (6) can be layered and it can comprise mutually coupled layers by implementing the belt (6). In detail the belt (6) comprises one or more structural levels (that is one or more layers superimposed and coupled to each other and configured to define the structural part of the belt (6) and then to support the loads acting on the belt (6)) and preferably an external level configured to come in contact with the ground when the equipment 1 is in use. The external level can define the above-mentioned surface distal from the ski (1).

**[0035]** Said one or more structural levels and then the belt (6) can include at least a structural primary level proximal to the ski (1), that is defining the above-mentioned surface proximal to the ski (1), and suitably one or more additional structural levels coupled to said structural primary level and to each other.

**[0036]** The above-mentioned lift group (G) comprises an engine unit (M) having the function of dragging in rotation the above-mentioned belt (6) according to a ring-like trajectory which develops for a first tract (T1) below the insole of the ski (1), in contact with the snow cover, and for a second tract (T2) above the ski (1), according to what shown in figure 1. In detail, the track and in particular the belt (6) thus defines a trajectory of ring-like development of the same belt (6) closed and enclosing the ski 2, that is it defines on a plane parallel to the longitudinal axis (Z) of the ski (1) and substantially perpendicular to the section of the ski (1) a closed path, enclosing inside thereof the whole ski (1).

**[0037]** Said trajectory is barycentric, that is it lies on a barycentric plane, to the belt (6) (then to said track) and in use (that is when the belt (6) is associated to the ski (1)) to the ski (1).

**[0038]** To this purpose the belt (6) exploits the return action of a first roller (51), revolving in idle way, mounted transversely at the tip (11) of the ski (1) and of a second roller (52) revolving in idle way mounted transversely at

the tail (12) of the ski (1); being also provided that said belt (6) inserts exactly, for a portion of the above-mentioned second tract (T2) of its trajectory, inside the above-mentioned duct (16) delimited on the upper portion by the bridge-like structure (15).

**[0039]** To the purpose of a more effective containment of the belt (6) during its rotation, it is provided that each one of the above-mentioned rollers (51, 52) cooperates with a pair of sides (s) capable of containing the longitudinal edges of the belt (6).

**[0040]** With reference to Figure 6 the above-mentioned sides (s) are obtained on two supporting arms (W1) which support revolvingly the roller (51, 52). In particular, the supporting arms (W1) are integrating portion of a frame (W) fastened on the tail or the tip of the ski (1).

**[0041]** In an alternative version not shown in the enclosed figures said sides can consist in discoidal sides obtained directly at the end of the roller (51, 52).

**[0042]** In order to guarantee to the equipment at issue a greater grip on the snow cover on the climbing occasion, it is provided that the above-mentioned belt (6), at the surface distal from the ski (1), adopts a surface finishing of the so-called seal skin-like type, or equivalent. In particular, said external level can define said surface finishing.

**[0043]** In order to ease, instead, the assembly and disassembly of the same belt (6) onboard the ski (1) it is provided that it comprises a first end (61) and a second end (62) suitable to be connected through connection means of detachable type (63), which can be easily decoupled, as shown in figures 10 and 11. Said connection means of detachable type (63) comprises a first series of eyelets (631) arranged in the first end (61) and a second series of eyelets (632) arranged in the second end (62). The second series of eyelets (632) penetrates the first series of eyelets (631) so as to produce one single duct suitable to receive a connecting pin (632). With reference to Figure 10 the two series of eyelets (631 and 632) are shown decoupled from each other, whereas in Figure 11 the two series of eyelets are shown coupled to each other through the connecting pin (632).

**[0044]** With specific reference to figures 7, 8 and 9, the above-mentioned engine unit (M) comprises a motor (2) and a toothed drum (4) dragged in rotation by said motor (2). Said drum (4) has a rotation axis (X) orthogonal to the longitudinal axis (Z) of the ski (1).

**[0045]** This drum (4) constitutes the component effectively intended to guarantee, during its rotation, the dragging of the above-mentioned belt (6), thanks to the fact that said drum (4) adopts at its two lateral edges respective radial series of teeth (40) suitable to couple exactly, during the rotation of the drum (4) itself, with respective longitudinal series of holes (60) provided at the edges of the belt itself (6), shown in figure 2.

**[0046]** With reference to Figure 9, the above-mentioned lift group (G) comprises a managing and control electronic unit (U) which manages the motor (2) of the engine unit (M) by sending it commands to optimize the

operation thereof. Moreover, the lift group (G) further comprises a power supply battery (3) for said motor (2) for said managing and control electronic unit (U).

**[0047]** With reference to Figures 1, 2, 7 and 9 said battery (3) is mounted above the ski (1) in position just behind the engine unit (M) and preferably it results to be connected to the above-mentioned motor (2) through power cables (not shown in the enclosed figures) equipped with traditional connectors suitable to be inserted at one end to the plug (P3) supplied with the battery (3) and at the other end to the plug (P2) supplied with the motor (2). The battery is further connected even to the management and control unit (U) through power cables not shown in the enclosed figures.

**[0048]** For the stable fastening of said battery (3) it is provided that the lift group (G) further comprises quick connection means (30) for the quick connection of the battery to the ski (1).

**[0049]** In the preferred embodiment of figure 7, said quick connection means (30) comprises a cradle-like support (30a), intended to embrace on the lower portion the battery (3), and an overlying pair of tapes (30b) made of Velcro suitable to embrace on the upper portion the battery (3), once having inserted it exactly in said cradle-like support (30a).

**[0050]** In order to guarantee a better stability to a similar coupling it is provided that the battery (3) adopts a median annular groove (3a), intended to receive exactly the above-mentioned cradle-like support (30) and the two tapes (30a) made of Velcro. To the purpose of the more effective operation of the sports equipment according to the invention, it is also provided that the above-mentioned lift group (G) comprises a tension and idler roller (7) for the belt (6) mounted in underlying position and in asset parallel with respect to the above-mentioned drum (4).

**[0051]** The tension roller (7) is equipped with suitable register means (8) allowing to adjust the position thereof along the longitudinal axis (Y) of the ski (1) with the purpose of optimizing every time the tension of the belt (6).

**[0052]** In the same line the presence, in intermediate position between the above-mentioned motor (2) and the above-mentioned toothed drum (4), of transmission means (9) is provided.

**[0053]** In the preferred embodiment shown in figure 9, said transmission means (9) comprises:

- a first pinion (91) keyed on the shaft of the motor (2)
- a second pinion (92) connected to the toothed drum (4); and
- a chain (not shown in the enclosed figures) engaging on the two above-mentioned pinions (91, 92).

**[0054]** Advantageously between the second pinion (92) and the drum (4) reduction means (90) is present, preferably consisting in a group of epicyclic gears known to a person skilled in the art.

**[0055]** To the purpose of its installation on the ski (1)

the above-mentioned engine unit (M) is associated to a supporting frame (T) equipped with means for hooking to the upper surface of the ski (1) so that said engine unit (M), if needed, could be disassembled from the ski (1).

**[0056]** In the preferred embodiment shown in figures 8 and 9 it is provided that the above-mentioned supporting frame (T) has a box-like structure comprising two identical opposite flanks (F1, F2), so as to define centrally a compartment suitable to contain the above-mentioned motor (2) and the above-mentioned toothed drum (4).

**[0057]** It is further specified that said supporting frame (T) is also used for supporting the above-mentioned register means (8) of the tension roller (7).

**[0058]** In particular, said supporting frame (T), at the base of the above-mentioned opposite flanks (F1, F2), has as many slots (Ap) extending in the sense of length of the ski (1) and which are suitable to be crossed by a transverse rod (71) belonging to a carriage (70), as well as capable of sliding from an end to the other one of said pair of slots (Ap).

**[0059]** Actually, the ends of said transverse rod (71) project outside such slots (Ap) to sustain the opposing arms (72) of the above-mentioned carriage (70), wherein said arms (72) sustain, at their end positioned on the side of the above-mentioned toothed drum (4), the above-mentioned tension and idler roller (7).

**[0060]** It is easy to understand, in this context, that said carriage (70) can alternatively slide with respect to the ski (1), under the manual impulse of the user and by exploiting the guiding action which the two above-mentioned slots (Ap) guarantee to its above-mentioned rod (71).

**[0061]** The above-mentioned arms of said carriage (70) further sustain, at the end opposite with respect to the one sustaining the tension roller (7), the above-mentioned register means (8), consisting in two threaded handwheels (81), cooperating too with the above-mentioned slots (Ap), as well as provided with the capability of locking their position in a desired point of said slots (Ap), once having found the right adjustment of the carriage (70) and then of the tension roller (7) of the belt (6). Advantageously the above-mentioned supporting frame (T) further houses a "S"-like shaped conveyor insert (IC) which with its particular shape promotes the insertion of the belt (6) inside the supporting frame (T) around the drum (4).

**[0062]** With reference to Figure 12 in order to avoid any transverse slipping of the belt (6) on inclined routes, said belt (6) is equipped with a central rib (65), also simply called rib, for alignment, protruding from an internal face of the belt (6) and which is suitable to settle in corresponding annular cavities (45; 55) obtained on the drum (4) and on the rollers (51 and 52). The above-mentioned annular cavities (45; 55) are visible in Figures 6 and 9.

**[0063]** The above-mentioned annular cavities (45; 55) are useful for sliding the rib (65).

**[0064]** Consequently, the track and in particular the belt (6) can include a central rib (65), also simply called

rib (65), protruding from the belt (6); and the ski (1) comprises a groove for sliding the rib (65) suitably obtained at the lower surface of the ski, that is of the surface configured to arrange in use proximate to the ground and thus opposite to the upper surface thereto the bindings (AT) are anchored.

**[0065]** The central rib (65) is central since preferably lying on the plane, such as on said barycentre, on which the trajectory of the belt (6) lies.

**[0066]** The rib (65) protrudes from the belt (6) towards the ski (1). Then, it protrudes from the face of the belt (6) facing the ski (1).

**[0067]** The central rib (65) protrudes from the belt (6) for the whole extension of said belt (6) without continuity solution.

**[0068]** The rib (65) can develop for the whole extension of the belt (6) along the development trajectory of the belt itself.

**[0069]** When the belt (6) is moved with respect to the ski (2), the rib (65) is configured to slide into the groove and, suitably, in the annular cavities (45; 55).

**[0070]** The groove can develop for the whole extension of the lower surface of the ski (1) and then of the lower layer without continuity solution. Preferably it has a height, calculated perpendicularly to said lower surface, at least equal to that of the lower layer.

**[0071]** The rib (65) and the groove can have same height and in particular same section. The rib (65) can protrude from the primary level of the belt (6). It can be implemented in one single piece with said primary level of the belt (6).

**[0072]** Said level proximate to the ski and said central rib (65) can be of the same material and in particular implemented in one single piece. To be precise, rib (65) and belt are made of the same material and in detail in one single piece.

**[0073]** The components of the sports equipment according to the invention are completed by a unidirectional clutch (FU) controlled by the above-mentioned lift group (G) with the task of allowing the rotation of the toothed drum (4) in one direction and to prevent it in the other direction; as well as one or more movement or force sensors (not shown in the enclosed figures) which are operatively connected to the management and control unit (U) and which are suitable to detect the motion of the ski (1) and to send in real time the related piece of data thereof to the above-mentioned management and control unit (U).

**[0074]** Said sensors could consist in speed sensors, accelerometers, gyroscopes and load cells provided that they are capable of detecting motions, forces and torques.

**[0075]** Said sensors, being in communication with the above-mentioned control unit (U), allow having a system wherein the commands sent to the motor (2) by such management and control unit (U) are in function of the signals received by the sensors.

**[0076]** This then allows to obtain an optimum motion

assistance.

**[0077]** The motion of one ski during ski mountaineering consists of three main steps: a pushing step, a swing step (foot on the tip and ski moving forward) and resting step. Then, these sensors allow to detect the above-mentioned motion steps and to adapt the power of the motor (2) based upon said steps.

**[0078]** It is obvious that the sports equipment described previously and comprising the ski (1) and the lift group (G) is to be used together with another piece of sports equipment still comprising one ski (1) and one lift group (G) so that the user could use a piece of sports equipment for the right foot and one piece of sports equipment for the left foot.

**[0079]** It is also possible to associate a portable device (smartphone, smartwatch, or the like), comprising a user interface, to the two pieces of sports equipment.

**[0080]** Said portable device is configured so as to be able to communicate with the control and management units (U) of the two pieces of sports equipment so as to allow to vary the parameters thereof and to monitor the user's sporting activity.

**[0081]** To the present invention embodiment several variations and modifications of detail can be introduced, however all within the scope of the invention set forth by the enclosed claims.

## Claims

1. Sports equipment comprising a ski (1) and a lift group (G); wherein said ski (1) comprises a longitudinal axis (Z), a tip (11), a tail (12), two lateral edges (13) and a bridge-like structure (15), arranged between the tail (12) and the tip (11), above the ski (1); said bridge-like structure (15) comprising, on the upper portion, a hooking surface (15a) for bindings (AT) of a user's boot and defining, on the lower side, a duct (16) below said hooking surface (15a); said lift group (G) comprising:

- an engine unit (M) comprising a motor (2) and a drum (4) moved by said motor (2); said drum (4) having a rotation axis (X) orthogonal to the longitudinal axis (Z) of the ski (1);
- a management and control unit (U) connected to said motor (2);
- a power supply battery (3) for said motor (2) of the engine unit (M) and said control unit (U);
- a first roller (51) arranged on the tip (11) of the ski (1);
- a second roller (52) arranged on the tail (12) of the ski (1);
- a belt (6) closed on itself and wound longitudinally around the ski under a condition for which it slides around the two rollers (51, 52), being dragged in rotation by the above-mentioned drum (4) and being slidably inserted on the duct

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and characterized by the fact that

- 5 - said belt (6) comprises a central rib (65) protruding from said belt (6) towards said ski (1)
- said ski (1) comprises a groove for sliding said central rib (65) when said belt (6) is dragged in rotation by the above-mentioned drum (4).
- 10 2. The sports equipment according to claim 1, wherein said central rib (65) protrudes from said belt (6) for the whole extension of said belt (6) without continuity solution.
- 15 3. The sports equipment according to at least a preceding claim, wherein said drum (4) and said rollers (51 and 52) comprise annular cavities (45; 55) for sliding said central rib (65).
- 20 4. The sports equipment according to at least a preceding claim, wherein said central rib (65) and said belt (6) are made of the same material and in one single piece.
- 25 5. The sports equipment according to claim 4, wherein said belt (6) comprises at least a structural primary level proximate to said ski (1); and wherein said central rib (65) protrudes from said primary level of said belt (6) and it can be implemented in one single piece with said primary level of said belt (6).
- 30 6. The equipment according to claim 5, wherein said belt (6) even comprises an external level configured to come in contact with a ground and having a surface finishing of the seal skin type, or equivalent.
- 35 7. The sports equipment according to at least a preceding claim, wherein said groove extends on the entirety of the lower surface of the ski (1) without continuity solution.
- 40 8. The equipment according to any one of the preceding claims, wherein said engine unit (M) comprises a supporting frame (T) fastened to the ski (1), wherein said frame (T) comprises two flanks (F1, F2) which delimit a compartment for housing said motor (2) and said drum (4).
- 45 9. The equipment according to claim 6 if depending from claim 2, wherein said supporting frame (T), at the base of the above-mentioned opposite flanks (F1, F2), has as many slots (Ap) extending in the sense of length of the ski (1) and which are suitable to be crossed by a transverse rod (71) belonging to a carriage (70), suitable to slide from an end to another one of said pair of slots (Ap); wherein the ends of said transverse rod (71) project outside such slots
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- 55

(Ap) to sustain the opposing arms (72) of the above-mentioned carriage (70), which sustain, at their end positioned on the side of the above-mentioned drum (4), the above-mentioned tension roller (7); wherein the above-mentioned register means (8) of the tension roller (7) consists of two threaded handwheels (81) cooperating too with the above-mentioned slots (Ap), so as to be able to lock their position in a wished position of said slots (Ap).

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**10.** The equipment according to any one of the preceding claims, wherein said lift group (G) comprises two sides (s) for the longitudinal edges of said belt (6) near the first roller (51) and near the second roller (52).

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**11.** The equipment according to any one of the preceding claims, wherein said lift group (G) comprises quick connecting means (30) to connect said battery (3) to the ski (1); and wherein the above-mentioned quick connection means (30) comprises a cradle-like support (30a) and an overlying pair of tapes (30b) made of Velcro.

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**12.** The equipment according to any one of the preceding claims, wherein the above-mentioned drum (4) at the ends has two radial series of teeth (40) suitable to engage with respective series of holes (60) implemented at the longitudinal edges of the belt (6).

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**13.** The equipment according to any one of the preceding claims, wherein said belt (6) comprises a first end (61) and a second end (62) suitable to be connected to each other through connecting means of detachable type (63).

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**14.** The equipment according to any one of the preceding claims wherein said lift group (G) comprises a unidirectional clutch (FU) shaped so as to allow the rotation of the drum (4) from a direction and to prevent it from the other direction.

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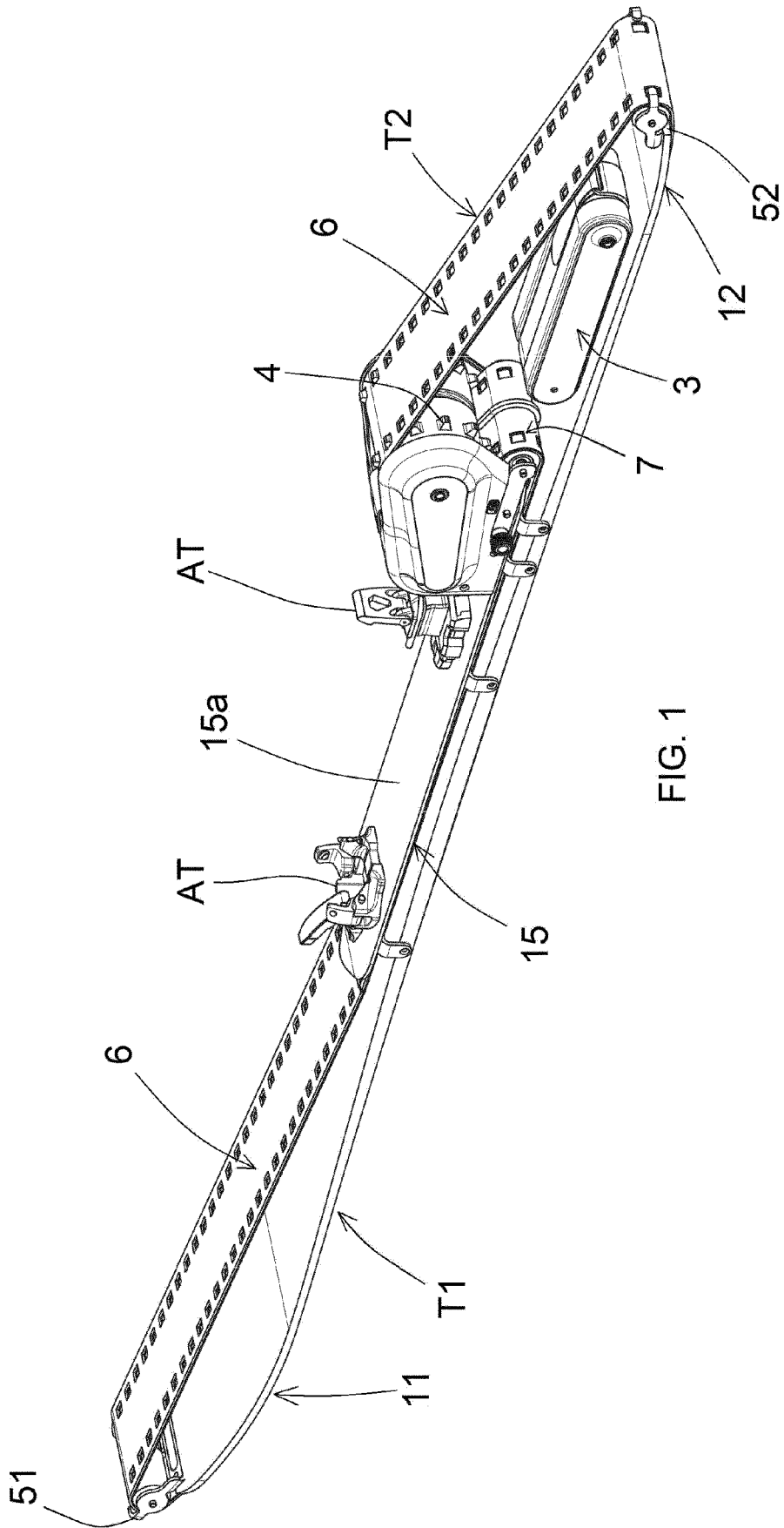


FIG. 1



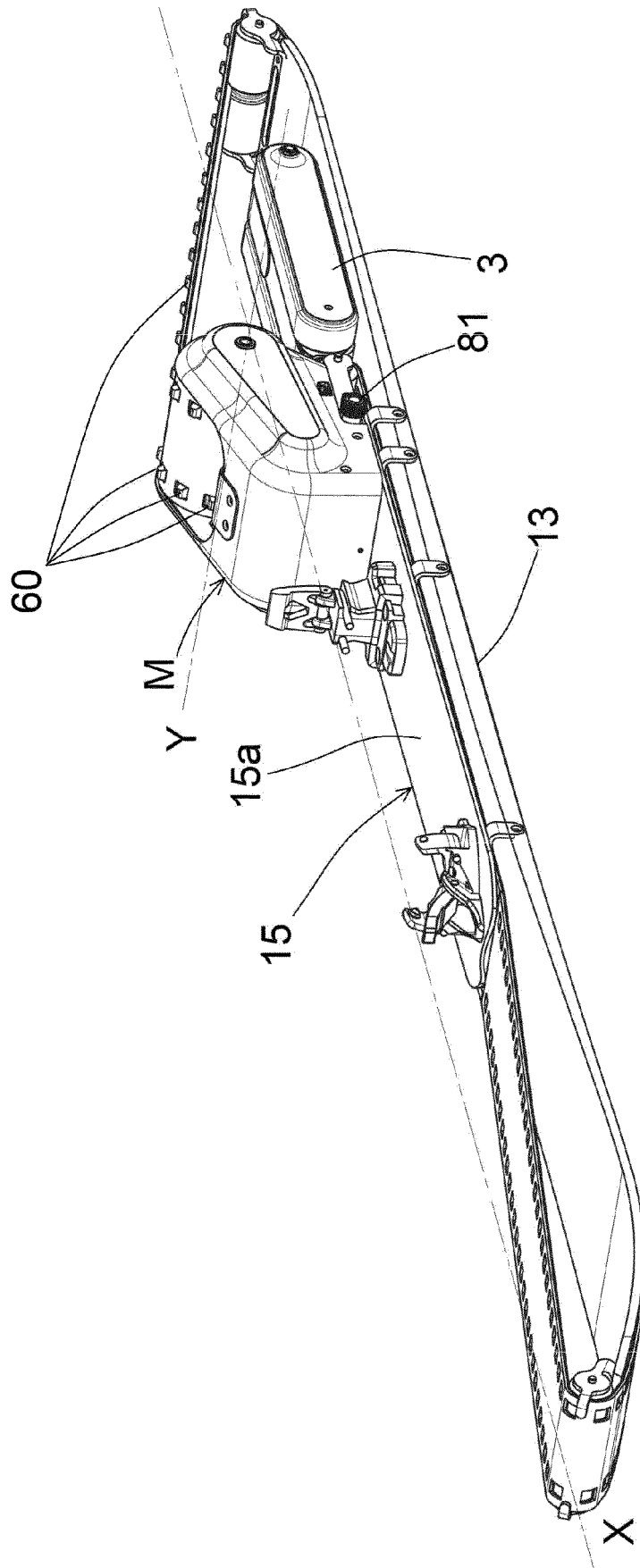
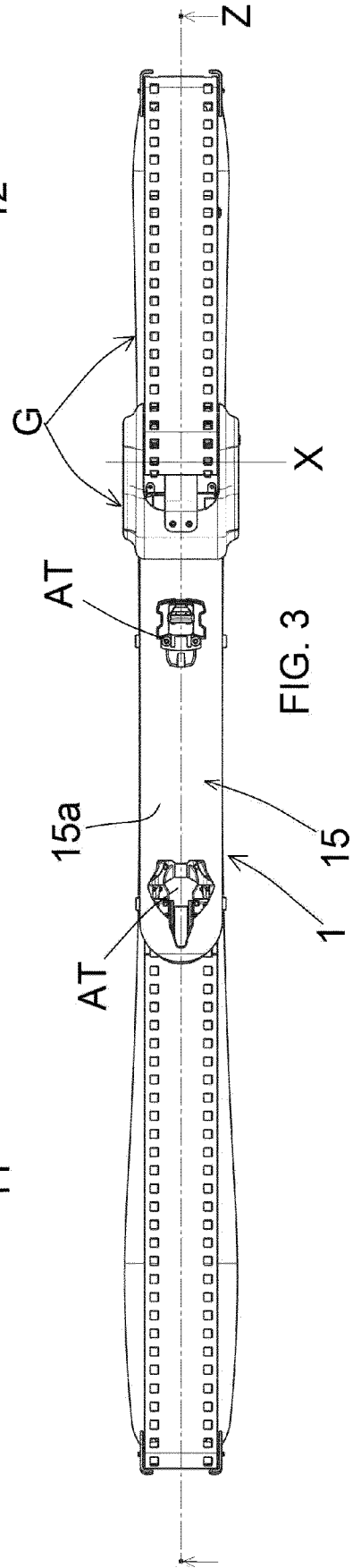
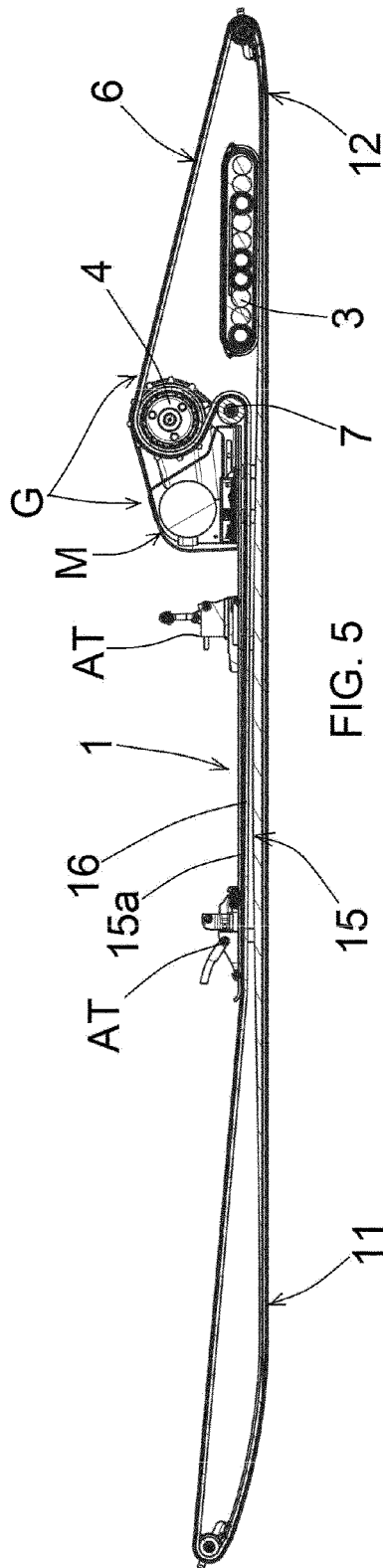
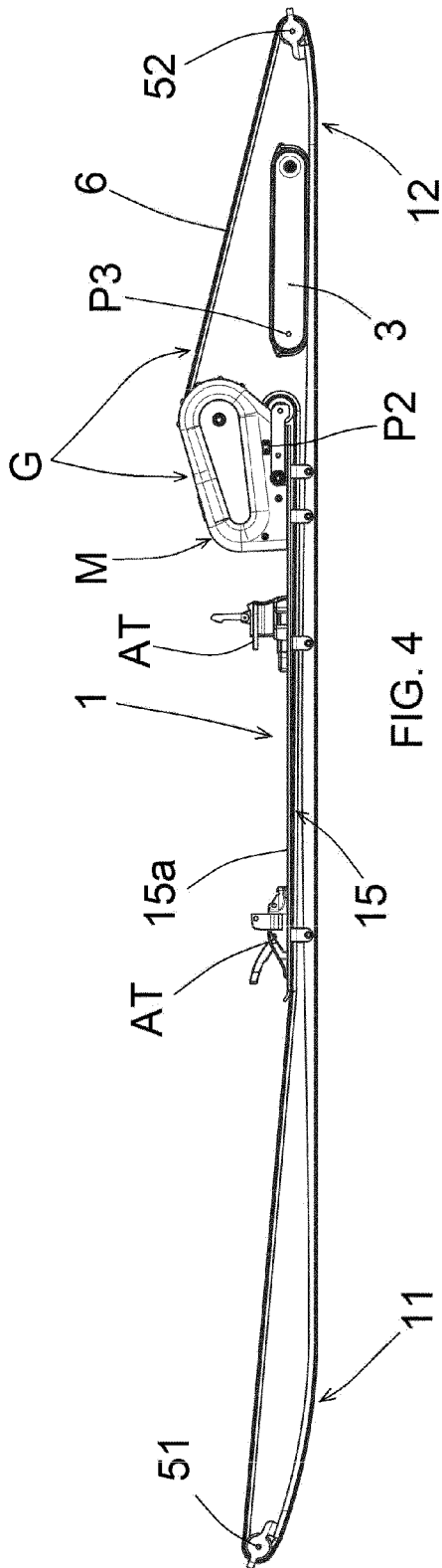


FIG. 2



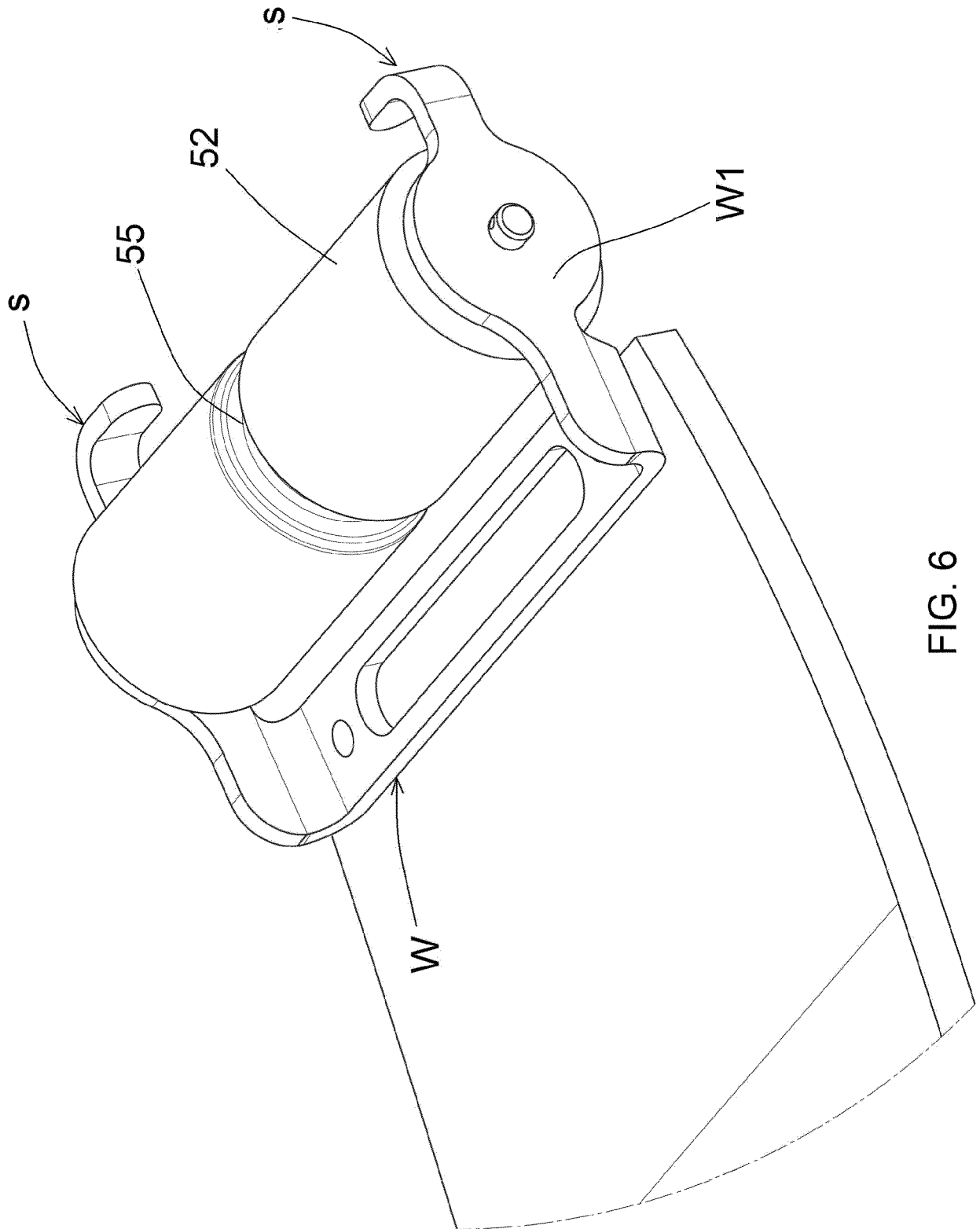


FIG. 6

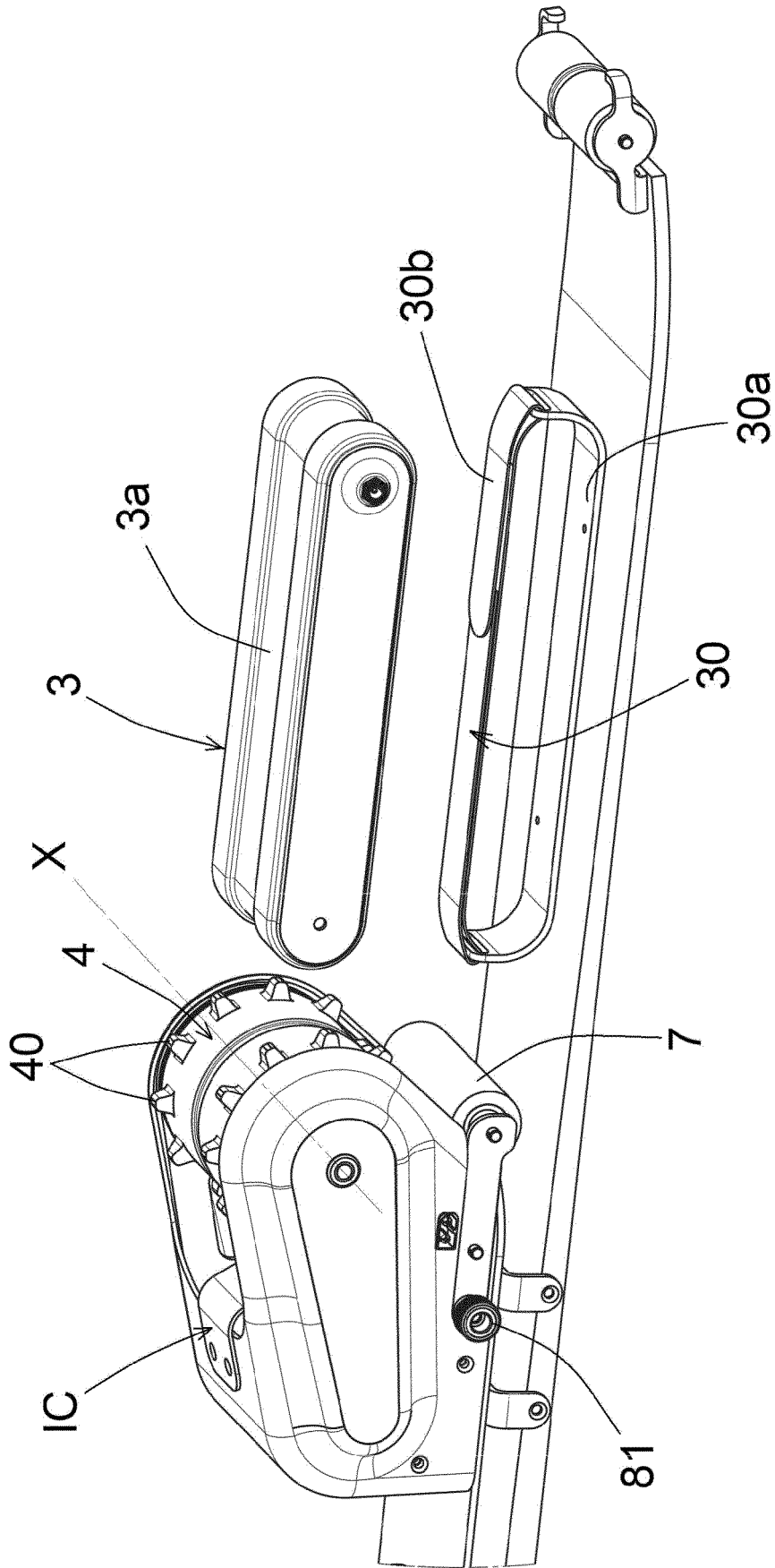


FIG. 7

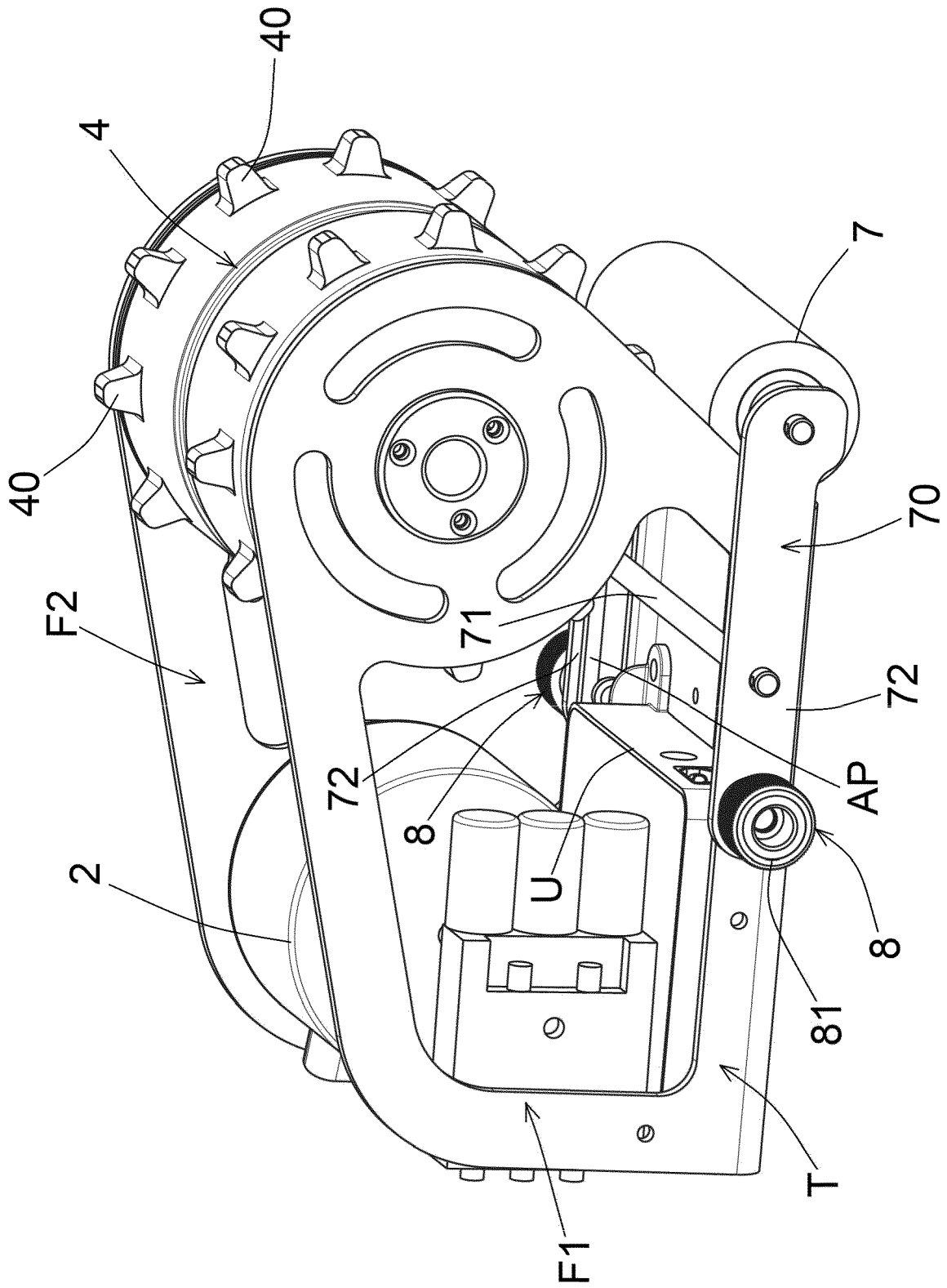


FIG. 8

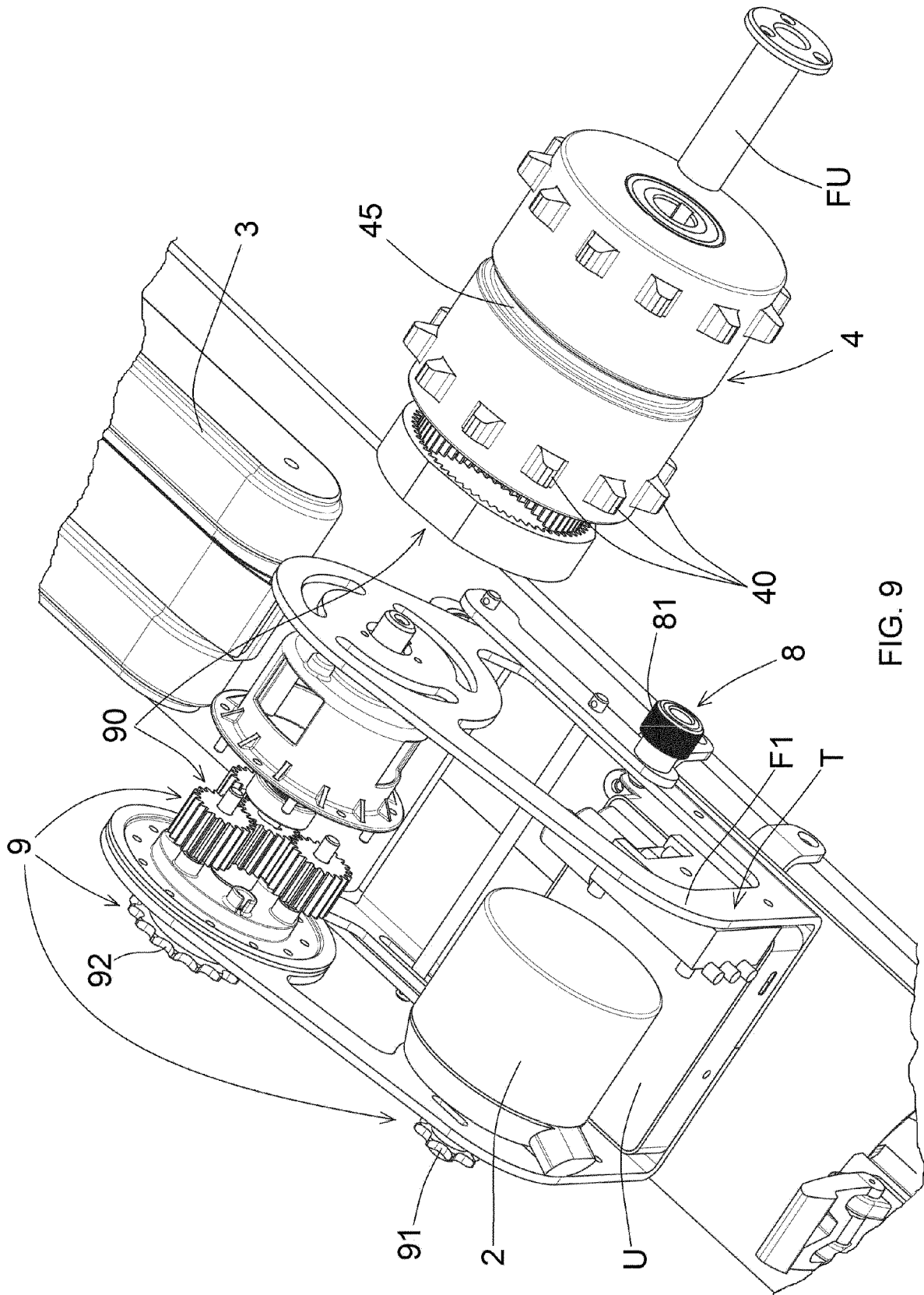


FIG. 9

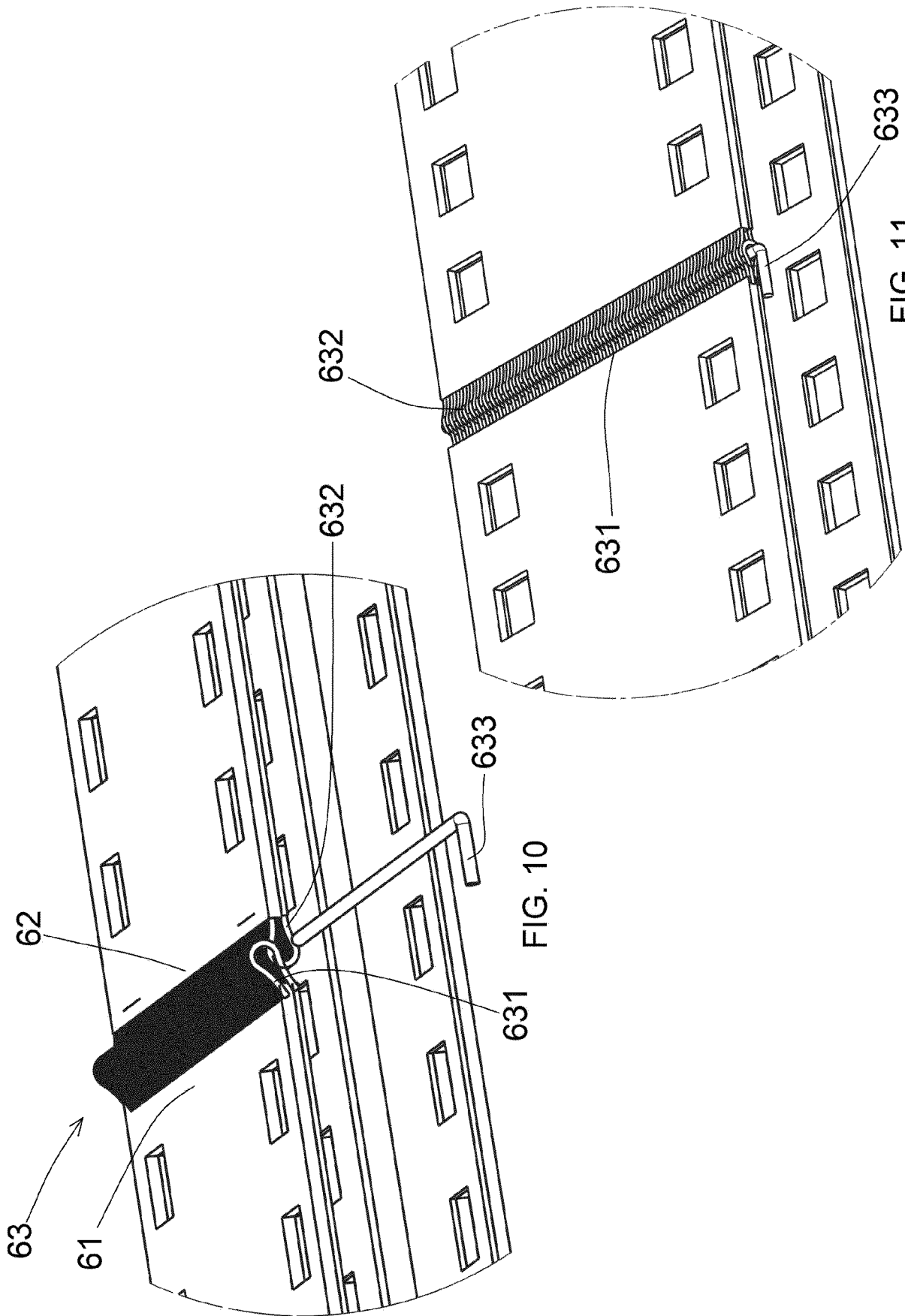


FIG. 10

FIG. 11

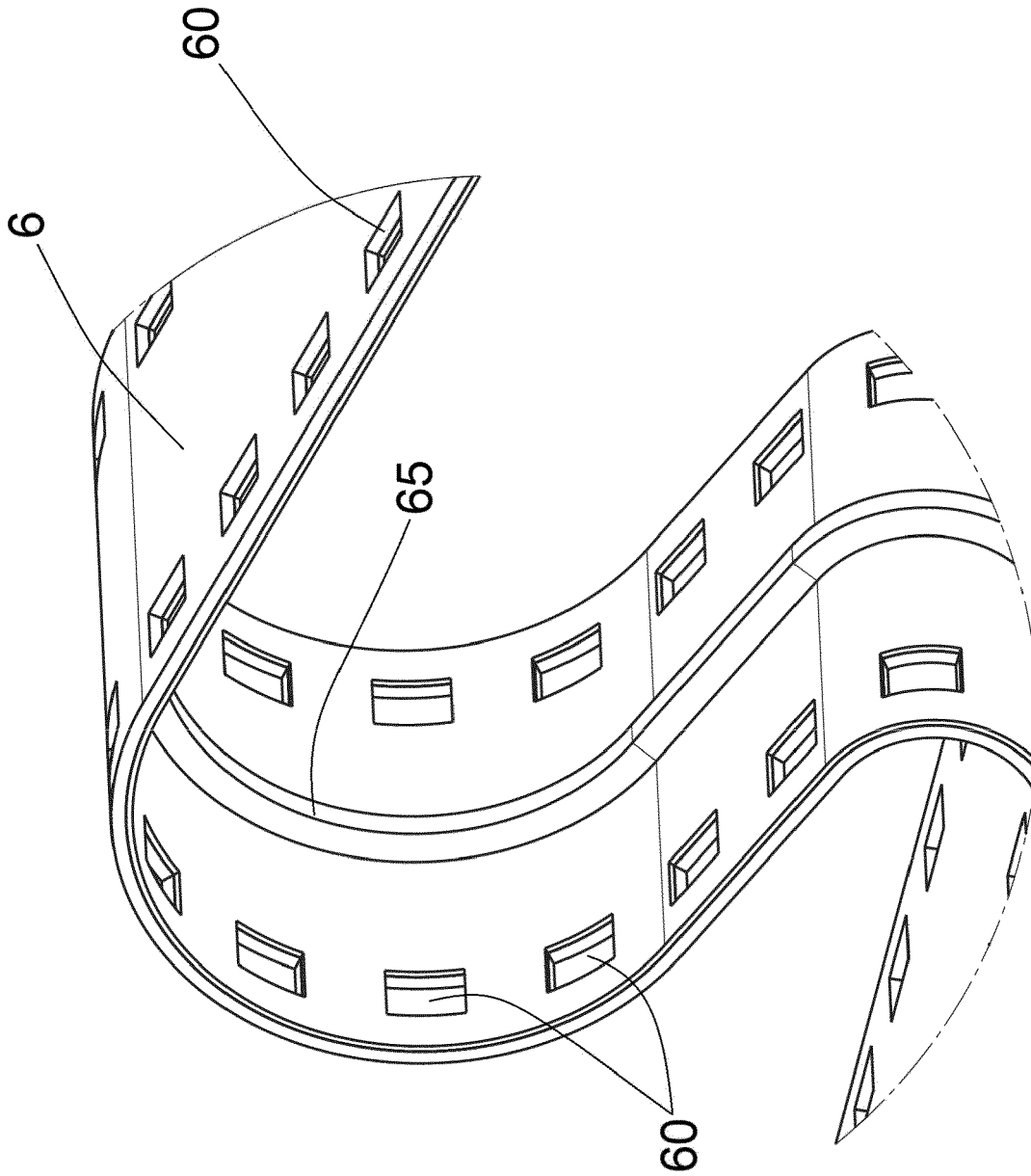


FIG. 12





EUROPEAN SEARCH REPORT

Application Number

EP 23 20 4137

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A	* paragraphs [0042], [0055]; figures 1, 5a, 5b, 5c * -----	1-9, 11-14	
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	* claims 1, 2; figure 1 * -----		
The present search report has been drawn up for all claims			
Place of search <b>Munich</b>		Date of completion of the search <b>6 March 2024</b>	Examiner <b>Murer, Michael</b>
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06-03-2024

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