

(19) World Intellectual Property
Organization
International Bureau



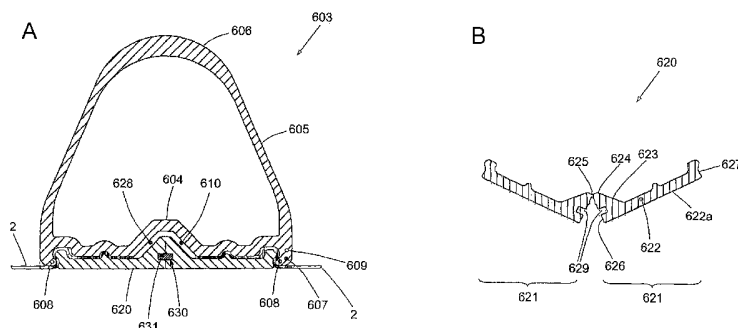
(43) International Publication Date
29 January 2004 (29.01.2004)

PCT

(10) International Publication Number
WO 2004/009933 A1

- (51) International Patent Classification: **E04H 4/10**, 15/64, F16B 5/06
- (21) International Application Number: PCT/NL2003/000529
- (22) International Filing Date: 17 July 2003 (17.07.2003)
- (25) Filing Language: Dutch
- (26) Publication Language: English
- (30) Priority Data: 1021101 18 July 2002 (18.07.2002) NL
- (71) Applicant (for all designated States except US): **POOLTECHNICS B.V.** [NL/NL]; Sluisweg 30A, NL-5145 PE Waalwijk (NL).
- (72) Inventor; and
- (75) Inventor/Applicant (for US only): **DE JONG, Leonardus, Johannes** [NL/NL]; De Merwede 3, NL-5152 RX Drunen (NL).
- (74) Agent: **GRIEBLING, Onno**; c/o Octrooibureau Griebling BV, Sportweg 10, NL-5037 AC Tilburg (NL).
- (81) Designated States (national): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.
- (84) Designated States (regional): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).
- Published:**
— with international search report
- For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: COVERING CONSTRUCTION, AND SUPPORT BEAM THEREFOR



(57) Abstract: A support beam (603) for a covering system for a swimming-pool or the like is described. This support beam comprises: (i) a bottom wall (604) and two stops (607) projecting from said bottom wall (604), mutually substantially parallel; (ii) a receiving space (610) defined by said stops (607) and the bottom wall (604); (iii) and a clamping profile (620) with a contour fitting to the receiving space (610), which comprises two clamping strip parts (621) pivotally coupled to each other; wherein the clamping strip parts (621) are coupled to each other by a pivoting device (625) which, in a clamping condition wherein the clamping strip parts (621) are clamped in the receiving space (610), is located at the side of the line which connects the free ends (627) of said clamping strip parts (621) directed towards the support beam.

WO 2004/009933 A1

Title: Covering construction, and support beam therefor

The present invention relates in general to a flexible, rollable covering construction, intended to be arranged over relatively large surfaces such as for instance a swimming pool, and to rest on the edges of this swimming pool. Although the present invention can also be applied in other situations, the invention will in the following be described more elaborately for the application of covering a swimming pool.

For several reasons, it may be desirable to cover a swimming pool when it is not in use. On the one hand it can be desirable to counteract cooling of the water, on the other hand it can be desirable to counteract pollution of the water by falling leaves. It may also be desirable to cover the pool with a view to security: the covering construction then serves to prevent playing children and/or animals to fall into the water. Thus, the covering construction must be capable to handle relatively large weight forces.

On the other hand, it is not desirable that the covering construction is designed as a completely stiff construction, on the one hand because this makes the construction heavy and expensive, but on the other hand because storing the construction, when the swimming pool is in use, would be very laborious. A swimming pool construction which has proved itself in practice therefore comprises in general a tarpaulin and a system of mutually substantially parallel support beams which support this tarpaulin. In use, the support beams rest at their ends on the edges of the swimming pool. When the swimming pool is used, the covering construction can simply be rolled up.

Herein, it is important that a strong connection exists between the tarpaulin, which typically is manufactured from a plastic, and the support beams, which typically are manufactured as a profiled beam, typically from aluminium or the like. For security considerations, the construction must be resistant to mechanical forces: for instance, if playing

children or animals find themselves on the construction, the tarpaulin may not come loose from the support beams.

In a known design, the tarpaulin is provided with longitudinal pockets, for instance by strips welded to the tarpaulin, wherein the support beams are located in those longitudinal pockets and thus are completely enveloped by the tarpaulin material. A disadvantage of such a design is that the tarpaulin must be manufactured as a whole, and that it is not simple to repair local damages. Another disadvantage concerns manufacturing: before insertion of the support beams into the longitudinal pockets, a support beam must first be positioned aligned with such longitudinal pocket, before the support beam can be shifted in its longitudinal direction into the pocket. This means that, for arranging the support beams, a work space is necessary which is at least two times as large as the length of the support beams.

Designs are already known in which individual strips of tarpaulin are fixed to the support beams at their edges. Each support beam then is a link in the covering construction, which not only determines the strength of the covering construction as a whole, but also provides for mutual connection of two successive strips of tarpaulin. In a known covering design of this type, such as for instance illustrated in European patent application 0.570.311, the strips of tarpaulin are at their longitudinal edges provided with a thickening, which fits in a longitudinal receiving space of the support beam, which receiving space close to the outer circumference of the support beam is narrowed to a width smaller than the thickness of the said thickening, such as to counteract that the strips of tarpaulin are pulled from said receiving space when a force is exerted thereon in a direction perpendicular to the longitudinal direction of the support beam.

Also in this case, a disadvantage is that the thickened edge of the strips must be threaded in the longitudinal direction into the groove-shaped receiving space of the support beams. Depending on the length of the support beams, this requires relatively much force. Moreover, it is already a disadvantage per se that thickenings must be formed to the

separate strips. Moreover, during use, the receiving space forms a gap in which dirt can collect, which is difficult to clean.

An objective of the present invention is to provide an alternative design which eliminates or at least reduces one or more of the said disadvantages.

To this end, the present invention provides a support beam which comprises a bottom wall and a receiving space associated with this bottom wall, as well as a clamping profile with a contour fitting to the receiving space, adapted to be inserted into the receiving space with a displacement direction perpendicular to the longitudinal direction of the support beam, and to clamp at least one strip of tarpaulin between a wall part of the receiving space on the one hand and the clamping profile on the other hand.

In a preferred embodiment, the receiving space is provided with two stops projecting from the bottom wall, and the clamping profile comprises two clamping strip parts hingedly coupled to each other, which are coupled to each other by a hinging device which, in the clamping condition in which the clamping strip parts are clamped in the receiving space, is located at the side directed to the support beam of the line which connects the free ends of those clamping strip parts.

It is noted that FR-1.467.374 describes a system with a clamping channel and a clamping bracket fitting in this clamping channel. In this case, the clamping channel has a substantially C-shaped contour. The clamping bracket is implemented as a flat plate, consisting of two plate halves which are hingedly connected to each other at their ends directed towards each other. At the surfaces hinging towards each other, each plate half is provided with a curved projection, of which the convex walls are directed towards the hinging point. At their ends, those projections are provided with a thickening, fitting in the curvature of curved ends of the clamping channel. In such a system, the clamping bracket is at the most usable for the function of decorative frame, but not for holding tarpaulin parts in a swimming pool

covering system, because this clamping channel is not resistant to the pulling forces which occur. After all, as soon as a pulling force is exerted on the tarpaulin, forces directed towards each other are exerted on the thickened end of the projections of the clamping bracket, which squeeze those projections towards each other. Since the known clamping bracket has no means for withstanding such forces, the two plate halves hinge towards each other and the clamping bracket becomes released. An important point in this case is that the hinge point is located outside the line which connects the clamping points to each other, i.e. the thickened ends of the projections of the clamping bracket. An important aspect of the present invention is that the hinge point is located inside the line which connects the clamping points, i.e. is located at the side of this line directed towards the bottom wall of the receiving space. On exerting squeezing forces on the clamping points of the clamping profile according to the present invention, the clamping profile is therefore only pushed more strongly into the receiving space of the support beam, such that the clamping profile is self-locking.

The present invention will be explained in more detail by the following description of preferred embodiments of a support beam according to the present invention with reference to the drawings, in which same reference numerals indicate same or similar parts, and in which:

figure 1 schematically shows a top view of a covering construction;

the figures 2A and 2B schematically show a cross-section of a first embodiment of a support beam according to the present invention, before and after clamping a tarpaulin, respectively;

the figures 3A and 3B schematically show a cross-section of a second embodiment of a support beam according to the present invention, before and after clamping a tarpaulin, respectively;

figure 3C at a larger scale shows a detail of this support beam;

the figures 4A and 4B schematically show a cross-section of a

third embodiment of a support beam according to the present invention, before and after clamping a tarpaulin, respectively;

the figures 5A and 5B schematically show a cross-section of a fourth embodiment of a support beam according to the present invention, before and after clamping a tarpaulin, respectively;

figure 6 schematically shows a cross-section of a fifth embodiment of a support beam according to the present invention, after clamping a tarpaulin;

figures 7A-D illustrate the use of the fifth embodiment of the support beam;

figure 8A schematically shows a cross-section of a sixth embodiment of a support beam according to the present invention, after clamping a tarpaulin;

figure 8B shows a detail of the sixth embodiment of figure 8A;

the figures 8C and 8D illustrate some preferred details;

the figures 9A-D illustrate the use of the sixth embodiment of the support beam.

Figure 1 schematically shows a top view of a covering construction 1, which comprises strips 2 of tarpaulin and support beams 3. The support beams 3 have ends 4, 5, which rest on an edge R of a swimming pool. This edge can be an elevated edge. In the following, the length direction of a support beam will be taken as longitudinal main direction. In figure 1, longitudinal side edges of a strip 2 are indicated by the reference numerals 6 and 7. The strip 2 further has transversal edges 8 and 9, which generally are directed perpendicular with respect to the longitudinal side edges 6 and 7, although this may differ depending on the shape of the swimming pool concerned.

The successive strips 2 can be sections of a tarpaulin which forms one hole, which are connected to the support beams in a suitable manner. It is, however, also possible that the successive strips 2 are individual strips of tarpaulin, which are connected to respective successive support beams 3 at their longitudinal edges 6 and 7.

Figures 2A and 2B schematically show a cross-section of a first embodiment of a support beam 103 proposed by the present invention. In these figures, also two strips 2₁ and 2₂ of tarpaulin are shown, with their right hand longitudinal side edge 7₁ and their left hand longitudinal side edge 6₂, respectively. This support beam 103 consists of two support beam halves 110A and 110B, which are manufactured separately from each other, and which are connected to each other for forming the eventual support beam 103, in which case they firmly clamp the edge parts 6, 7 of successive strips 2 of tarpaulin between them. In principle, it is possible that the two support beam halves are mutually different. However, in the preferred embodiment shown, the support beam halves 110A and 110B are mutually identical, which means in fact that a manufacturing machine needs to manufacture only one beam profile.

Within the context of the present invention, it is possible in principle that the two support beam halves are connected to each other by means of any suitable connecting means. Preferably however, the two support beam halves are provided with hooks snapping into each other, such that assembling the two support beam halves can simply take place without any tools by pressing the two support beam halves against each other.

In figure 2A, the two support beam halves 110A and 110B are loose from each other. Each support beam half 110 comprises an outer wall part 111, which has a substantially half-circular contour in the embodiment shown, in order for the eventual support beam 103 to be formed to have a substantially circular-cylindrical contour. From the concave inner surface of the outer wall part 111, at least one coupling strip 112 extends upwards, which coupling strip 112 at its free upper end is provided with a transversely extending grip part 113 and an oblique run-in face 114. In the embodiment shown, two of such coupling strips 112 are arranged next to each other on the inner surface of the outer wall part 111. If desired, however, three or more of such coupling strips can be arranged. Eventually, it is possible to suffice with a single coupling strip.

When the two support beam halves 110A and 110B are pressed into each other, the two run-in faces 114 of coupling strips 112 cooperating with each other meet each other, in which case the free ends of these coupling strips 112 press each other slightly sideways. Eventually, the projections 113 will pass each other, causing the ends of the coupling strips 112 to spring back again, and these projections 113 will engage behind each other as locking hooks. This condition is shown in figure 2B.

For holding a strip 2 of tarpaulin, each support beam half 110 is provided with at least one fitting finger 121, and with at least one fitting recess 122. When the two support beam halves 110A and 110B are arranged onto each other, the fitting finger 121A of the one support beam half 110A engages precisely into the fitting recess 122B of the second support beam half 110B, in which case the fitting finger 121A and the fitting recess 122B together form a labyrinth-shaped clamp 120 for a strip 2 of tarpaulin. The part of a strip 2 of tarpaulin clamped in this clamp 120 has now forcedly taken a zigzag-shape, wherein the number of curves depends on the number of fitting fingers and fitting recesses. In the exemplary embodiment shown, the strip of tarpaulin clamped-in makes three curves in total: a first curve of about 90° to the right, a second curve of about 180° to the left, and a third curve of about 180° to the right. If desired, the clamping part 120 can induce more curves in the clamping strip, by increasing the number of fitting fingers per clamp.

This construction offers a very secure clamping connection, which can resist very large pulling forces in the plane of a strip of tarpaulin, perpendicular to the longitudinal direction of a support beam 3, i.e. forces in the plane of drawing as indicated by the arrows F. Assembling the covering construction 1 is very simple: a lower support beam half 110B is placed, and edge parts 7₁, 6₂ of two successive strips 2₁, 2₂ of tarpaulin are placed thereon. Subsequently, an upper half 110A is arranged and clamped to the lower half 110B, whereby the support beam 103 is completed and whereby also the two strips 2 of tarpaulin are connected firmly to the support beam 103.

Thus, for mutually connecting the two support beam halves 110A, 100B, no tools are necessary. However, if desired, one can secure the two support beam halves 110A and 110B to each other by applying locking screws or the like.

Within the context of the present invention, it is possible that the longitudinal size of the coupling strips 112 is limited, and that the support beam halves 110A, 110B thus are provided with a multitude of individual clamping strips aligned with each other. However, it is preferred that the coupling strips 112 are implemented as continuous strips.

Similarly to figures 2A and 2B, the figures 3A and 3B schematically show a cross-section of a second embodiment 203 of the support beam proposed by the present invention. In this case, the support beam 203 is formed as a hollow extrusion profile with an outer wall 211 with a substantially circular cylindrical contour, although other outer contours will be possible also. For connecting a strip 2 of tarpaulin, the support beam 203 is provided with a groove-shaped, longitudinal receiving groove 220. In the example shown, the support beam 203 has two of such receiving grooves, for connecting two successive strips of tarpaulin. If desired, an end beam can be provided, which is intended to connect only one strip of tarpaulin, and which therefore comprises only one receiving groove, and for the remainder has a substantially smooth outer wall.

In profile, the groove-shaped receiving space 220 has a bottom 221, a throat 222, and a substantially funnel-shaped mouth 223, which ends at the outer surface of the support beam 203. The funnel-shaped mouth 223 has two side walls 224 which are substantially flat, and which extend from the throat 222 to the outer surface 204 of the support beam 204. The two side faces 224 make an angle with each other, such that the smallest mutual distance is located at the throat 222.

Further, the groove-shaped receiving space 220 has a chamber 225 defined between the throat 222 and the bottom 221, with walls 226 which diverge from the throat 222 and meet each other at the bottom 221.

Further, for each receiving space 220, the support beam 203 is provided with a clamping bar 230, which preferably and as shown has a substantially circular cylindrical contour. The chamber 225 has a corresponding contour. The diameter D of the clamping bar 230 is slightly larger than the width of the receiving space 220 at the location of the throat 222, indicated by the letter a. The clamping bar can be made from metal, for instance steel or aluminium, but the clamping bar can also be made from plastic or even rubber.

For connecting a strip 2 of tarpaulin, a longitudinal side edge 206 of this strip 2 of tarpaulin is folded over, and a clamping bar 230 is placed in the fold 201, which bar is subsequently pressed into the receiving space 220, with a direction of displacement perpendicular to the longitudinal direction of the support beam 203, as indicated by arrows P in figure 3A. The clamping bar 230 is pressed beyond the throat 222, until this bar is located in the chamber 225. Then, the strip 2 of tarpaulin is located between the clamping bar 230 and the walls 226 and the bottom 221 of the chamber 225, as illustrated in figure 3B.

The dimensions of the clamping bar 230 and the chamber 225 can be adapted to each other, in relation to the thickness of the strips 2 of tarpaulin, such that the strips 2 of tarpaulin are clamped between the clamping bar 230 and the walls of the chamber 225. However, this is not necessary. The clamping principle of this support beam 203 proposed by the present invention is based on a clamping when the strip 2 is loaded with a pulling force, as indicated by the arrows F in figure 3B. In that case, the strip 2 will want to pull the clamping bar 230 out of the chamber 225, and in doing so, pulls the clamping bar 230 against the throat 222. In this case, the strip 2 of tarpaulin is firmly clamped between the clamping bar 230 and the throat 222. The larger the pulling force on the strip of tarpaulin, the larger the clamping force which the clamping bar 230 and the throat 222 cooperating with each other exert on the strip 2 of tarpaulin.

Figure 3C shows in more detail a preferred embodiment of the throat 222. It can be seen that the inner wall 226 changes into a shoulder part 227 which makes a sharp angle 228 with

the corresponding side wall 224. This sharp angle is approximately 90° in the example shown, but can also be smaller.

In that case, it is advantageous if the clamping bar 230 is provided with longitudinal grooves, such that the angle 228 can press the tarpaulin 2 into such groove of the clamping bar 230 in order to increase the holding force.

In the figures 3A and 3B, the clamping is shown of two independent strips 2 of tarpaulin. However, it is also possible to use this second embodiment 203 of the support beam in combination with a continuous part of tarpaulin: in that case, the folded side edge parts 206 are connected to each other by a part of tarpaulin not shown in these figures, which then continues under the support beam 203.

The figures 4A and 4B are cross-sections, comparable to the figures 3A and 3B, of a third embodiment of a support beam 303 proposed by the present invention, which can be considered as a variation of the support beam 203 of the figures 3A and 3B. In the case of the support beam 303, a receiving space 320 for a clamping bar 330 has a bottom 321, a mouth 323, two opposite side walls 324 directed from the bottom 321 towards the mouth 323, which side walls 324 have side wall parts 324A next to the mouth 323, which side wall parts 324A, which in the following will also be indicated as clamping wall parts, diverge from the mouth 323 towards the interior 325 of the receiving space 320. In other words, these two clamping wall parts 324A make such angle with each other that their smallest mutual distance is located close to the mouth 323 and their largest mutual distance is located at the side of the bottom 321. Further, the receiving space 320 has a chamber 325 defined between the side walls 324 and the bottom 321.

The support beam 303 is provided with a separate clamping device 340 with a substantially U-shaped cross-contour, with a bottom 341 and two clamping legs 342. The clamping legs 342 have an outer contour fitting to the contour of the side walls 324 of the receiving spaces 320. Particularly, the clamping devices 340 at the ends of the legs 342 are provided with

oblique faces 343 which, during use, abut against the said clamping walls 324a.

At their ends, the legs 342 of the clamping device 340 are provided with a thickening or two projections 344 directed towards each other, of which the mutual distance is smaller than the diameter of an associated clamping bar 330. Behind these projections 344, a receiving space 345 is large enough for receiving this clamping bar 330.

The use of this support beam 303 proposed by the present invention is as follows. A longitudinal side edge 306 of a strip 2 of tarpaulin is folded over, and a clamping bar 330 is placed in the fold 301. The combination of folded edge 306 of tarpaulin with clamping bar 330 is pressed into the receiving space 345 of the clamping device 340. The combination of the clamping device 340 and the strip 2 of tarpaulin with clamping bar 330 arranged therein is shifted lengthwise into the chamber 325 of the receiving space 320. This placing is relatively simple, without much force needed to be exerted on the tarpaulin 2, since the pulling and pushing forces can now be exerted on the clamping device 340. Advantageously, this clamping device 340 can be made from metal, for instance aluminium or steel.

In general, the clamping device 340 will fit with some play into the receiving space 320 of the support beam 303, while the clamping bar 330 with tarpaulin 2 can fit with a slight play into the clamping device 340. When, during use, a pulling force is exerted on the tarpaulin 2, as indicated by the arrows F in figure 4B, the tarpaulin 2 pulls the clamping bar 330 into the direction of the mouth 323, in which case the clamping bar 330 can not pass the said projections 344 on the ends of the legs 342 of the clamping device 340 since the mutual distance between these projections 344 is smaller than the diameter of the clamping bar 330. Now, an outwardly directed pulling force will also be exerted on the clamping device 340, causing the clamping device 340 to be pulled firmly against the clamping faces 324a of the receiving space 320, as a result of which these clamping faces 324a will exert an inwardly directed pinching force on the ends of the legs 342 of the clamping device 340. The tarpaulin 2 is firmly

clamped between the clamping bar 330 and the legs 342 of the clamping device 340 by this pinching force, such that the tarpaulin 2 can not be pulled loose from the construction.

In order to counteract with more certainty that the clamping device 340 can be pulled from the chamber 325 of the receiving space 320, the mouth 323 is preferably provided with projecting side edges 329, as shown. When the clamping device 340 has been inserted in the chamber 325 of the receiving space 320, the legs 342 of the clamping device 340 are stopped by these side edges 329.

The figures 5A and 5B are schematical cross-sections which illustrate a fourth embodiment 403 of a support beam proposed by the present invention.

In the embodiment shown, the support beam 403 is intended for coupling two successive strips 2 of tarpaulin, to which end the support beam 403 is implemented symmetrically. However, such symmetry is not necessary, as will be clear to a person skilled in the art. Because of the symmetry, only one half of the support beam 403 will be discussed hereafter for sake of simplicity; thus, in the case of symmetry, this discussion relates to both halves.

The support beam 403 comprises a basic part 410 with an in this case substantially half-circular contour. Other contours are also possible of course. Although the present invention is applicable in solid support beams, the support beam 403 is preferably implemented as a hollow extrusion profile, and the base part 410 has a half-circular outer wall 411 and a substantially straight basic wall 410. Further, for increased strength, a supportive partition 413 is arranged.

At least one clamping recess 414 is arranged in the basic wall 412.

Further, the support beam 403 comprises a wing part 420, which in the example shown has a contour which substantially corresponds to a circle segment. The preferably hollow wing part 420 has a substantially partially circular outer wall 421, a first side wall 422 and a second side wall 423, which two side walls are substantially flat and meet each other under a sharp angle at a top part 426, which is connected to a

central part of the basic wall 412 of the basic part 410. According to an important aspect of the present invention, the wing part 420 is pivotable in relation to the basic part 410 with respect to a pivot axis directed in the longitudinal direction of the support beam 403. Within the context of the present invention, it is possible that the wing part 420 and the basic part 410 are formed as two independent components, which are connected by means of a pivot construction. However, preferably, and as show, the wing part 420 and the basic part 410 are formed together as an integral extrusion product. The pivoting capability of the wing part 420 with respect to the basic part 410 is then offered by a plastic deformation of the material bridge 425 which connects the top of the wing part 420 with the basic wall 412 of the basic part 410.

The first side wall 422 of the wing part 420 is provided with a clamping cam 424, with a contour which substantially corresponds to the contour of the said clamping recess 414. The position of the clamping cam 424 on the first side wall 422 of the wing part 420 fits to the position of the clamping recess 424 on the basic wall 412 of the basic part 410, such that, in the case of a pivot movement of the wing part 420, the clamping cam 424 can enter the clamping recess 414. In figure 5A, the support beam 403 is shown in an initial condition, in which the clamping cam 424 is located outside the clamping recess 414. In this condition, a strip 2 of tarpaulin can be arranged into the space which is confined by the basic wall 412 of the basic part 410 and the first side wall 422 of the wing part 420. Subsequently, the wing part 420 is pivoted down with respect to the basic part 410, in which case the said clamping cam 424 enters the said clamping recess 414 and the strip 2 of tarpaulin is clamped between the basic wall 412 of the basic part 410 on the one hand and the first side wall 422 of the wing part 420 on the other hand. More particularly, the strip 2 of tarpaulin is clamped between the clamping cam 424 and the clamping recess 414, wherein the strip 2 of tarpaulin is forced to take a zigzag shape at the location of the clamping recess 414. Because of this forced zigzag shape, a good securing is achieved against the strip 2 of tarpaulin being pulled free.

In the example shown, only one clamping recess 414 is present, with only one corresponding clamping cam 424. As a variation, it is possible that multiple clamping recesses are present, with multiple corresponding clamping cams, such that the strip of tarpaulin is then forced to take a meandering contour, comparable to the embodiment of clamp 120 discussed earlier.

In the embodiment shown, the clamping recess 414 is located in the basic part 410 and the clamping cam 424 is formed on the wing part 420. In a variation, a clamping recess can be arranged in the first side wall 422 of the wing part 420 and a clamping cam can be formed on the basic part 410.

Within the context of the present invention, it is possible that the longitudinal dimension of the clamping recess 414, and also the longitudinal dimension of the corresponding clamping cam 424, is limited, and that the support beam 403 is thus provided with a multitude of individual clamping recesses and clamping cams, preferably located aligned with each other. With a view to manufacturing technique, however, it is preferred that the clamping recess 414 is implemented as a continuous longitudinal groove, and that the corresponding clamping cam 424 is implemented as a continuous longitudinal ridge.

Making the wing part 420 pivot in order to thus clamp the strip 2 of tarpaulin requires some force in order to deform the said material bridge 425. This force can in principle be exerted with a special tool. Furthermore, it is desirable to provide a locking which counteracts the wing part 420 pivoting back. This function can in principle be offered by locking means which secure the wing part 420 to the base part 410. In this case, by way of example, one may think about a screw connection. However, in the preferred exemplary embodiment shown, the support beam 403 comprises a closure part 430 which fulfills multiple functions simultaneously. The closure part 430 has a wedge-shaped contour, with an outer wall 431 substantially having the shape of a circle segment, and two side walls 432 which substantially radially extend towards each other from the ends of this outer wall 431. The ends of these two side walls 432 are at a distance from each other.

The closure part 430 can be implemented partially solid, but preferably also the closure part 430 is implemented as a hollow extrusion profile. A strengthening bridge 439 connects the two side walls 432 with each other, substantially close to the centers of these side walls.

The closure part 430 serves on the one hand as tool for implementing the pivot movements of the two wing parts 420. In the initial condition as illustrated in figure 5A, the two wing parts 420 are at sufficient distance from each other, such that the free ends of the side walls 432 of the closure part 430 can be placed in the intermediate space between the two wing parts 420. The side edges 427 directed to each other of the outer walls 421 of the wing parts 420, in this case, make contact with the respective outer surfaces of the side walls 432 of the closure part 430.

Subsequently, a radially inwardly directed force is exerted on the outer wall 431 of the closure part 430, as indicated by arrow F in figure 5A, causing the closure part 430 to be pressed into the said intermediate space between the two wing parts 420. The oblique side walls 432 of the closure part 430, in this case, cause forces directed tangentially away from each other on the said side edges 427 of the wing parts 420, which force these two wing parts 420 to pivot around the said pivot axis. In this case, it is advantageous if the said side edges 427 are provided with a rounded run-in profile.

The design of the closure part 430 is adapted to the design of the basic part 410 with the two wing parts 420, such that the mutual angle between the two side walls 432 of the closure part 430 substantially corresponds to the angle which the two side walls 423 directed towards each other of the wing parts 420 make with each other in the operative condition wherein the wing parts 420 are pressed against the base part 410, as illustrated in figure 5B. In that case, the side walls 432 of the closure part 430 are directed substantially parallel to the respective second side walls 423 of the wing parts 420.

Now, the closure part 430 also fulfills the function of locking device, because a pivot movement of the wing parts 420

directed backwards is prevented by the closure part 430 lying between the wing parts. As shown in figure 5B, the closure part 430 rests on the said side edges 427 of the outer walls 421 of the wing parts 420, wherein the outer wall 431 of the closure part 430 forms a force-transferring bridge between these two side edges 427 of the two wing parts 420. In this case, the two wing parts 420 in fact rest against each other, with interposition of the outer wall 431 of the closure part 430.

In order to lock the closure part 430 in this position, the free edges of the side walls 432 of the closure part 430 are provided with hook parts 434 directed away from each other, which, on insertion of the closure part 430, can engage behind locking cams 428 formed on the said second side walls 423 of the wing parts 420. As clearly visible in figure 5A, these locking cams 428 have a substantially triangular contour, with a run-on wall 429 directed oblique with respect to the side walls 423 concerned of the wing part 420, which, on insertion of the closure part 430, will elastically deform slightly the corresponding side wall 432 of the closure part 430. When the hook-shaped end 434 of this side wall 432 has passed the run-on face 429, the side wall 432 springs back, wherein this hook part 434 engages itself behind the locking cam 428.

Thus, a very secure clamping connection is formed, which can resist large forces.

On insertion of the closure part 430, the side walls 432 will slightly deform elastically, as described above. The elastic deformation will occur substantially in the free lower part of the side wall 432, i.e. that part between the free hook-shaped end edge 434 and the support bridge 429. The length of this free end part determines inter alia the ease with which the hook-shaped end edges 434 can be pressed inwards over a certain distance. This means that the position of the support bridge 439 is a design parameter in this respect. The closer this bridge 439 is located to the hook-shaped end edges 434, the more difficult it will be to press these end edges inwards.

Figure 6 is a cross section of a fifth preferred embodiment of a support beam 503 proposed by the present invention. In the context of the present invention, this support beam 503 can be a solid support beam, but preferably the support beam 503 is formed as a hollow extrusion profile, as shown. Advantageously, the material of the support beam 503 is aluminium or steel, but other materials are also possible. The support beam 503 can have a circular cylindrical contour. In the embodiment shown, the support beam 503 has a somewhat flattened shape.

The support beam 503 is suitable to be connected at any position with respect to a continuous tarpaulin, but this support beam is also suitable to be connected to two neighboring strips of tarpaulin. In contrast to the embodiments discussed in the above, the support beam 503 has, for coupling with two adjacent strips of tarpaulin, a single common receiving space 510 which is shaped as a longitudinal groove-shaped recess in an outer wall 519 being otherwise substantially circularly shaped. On the ends of the side walls 512 directed away from the bottom 511, locking edges 514 directed towards each other are formed, between which a mouth 513 is left.

Preferably, and as shown, a central longitudinal ridge 515 is formed on the center of the bottom 511. Otherwise, the walls 512 and the bottom 511 can be completely flat, but preferably and as shown the bottom 511 and the side walls 512 are provided with longitudinal ribs 516.

The support beam 503 is provided with a substantially U-shaped clamping profile 520, with an outer contour which fits to the contour of the receiving space 510. Thus, this clamping profile has a bottom 521 and two side walls 522 diverging with respect to the bottom 521. At the free end of the diverging side walls 522 directed away from the bottom 521, a support edge 523 directed to the center of the clamping profile 520 is arranged, which in the embodiment shown has a substantially L-shaped contour. The transition between side wall 522 and support edge 523 forms a shoulder 524.

The clamping profile 520 is intended to be arranged in the receiving space 510, in which case the bottom 521 of the

clamping profile 520 corresponds to the bottom 511 of the receiving space 510. For receiving the central ridge 515 of the receiving space 510, the bottom 521 of the clamping profile 520 is provided with a longitudinal groove 525. To this end, the central part of the bottom 521 can be implemented as a substantially U-shaped bottom part 526, as shown.

Preferably, the clamping profile 520 is implemented as an extrusion profile from a metal, preferably aluminium or steel, but other materials are also possible.

The space which is enclosed by the bottom 521 and the side walls 522 of the clamping profile 520 will be indicated as receiving space 527.

Further, the support beam 503 is provided with a locking profile 540, which preferably and as shown has a substantially circular cylindrical outer contour. The locking profile 540 may be implemented as a solid bar, but is preferably implemented as a hollow extrusion profile. Preferably, the locking profile 540 is made from aluminium or steel, but other materials are also possible.

Now, with reference to figures 7A-D, connecting two strips of tarpaulin to the carrying profile 503 will be discussed. It is noted in this context, that same or similar actions may also be used in connecting a continuous tarpaulin, so this is not illustrated separately.

In a first step (illustrated in figure 7A) the edge parts of two neighboring strips 2 of tarpaulin are placed over the mouth 513 of the receiving space 510 of the support beam 503 (shown only partly), in which case they partly overlap each other. The clamping profile 520 is placed in front of the receiving space 510, with its bottom 521 directed towards the receiving space 510. Figure 7A further schematically shows a part of a placing tool 560 which is movable up and down, which at an end is provided with a pressing table 561. The placement tool 560 is placed in front of the clamping profile 520, and moved upwards, into the receiving space 527.

In a next step, illustrated in figure 7B, the placement tool 560 is moved upwards, such that the pressing table 561 comes into contact with the bottom part 521 of the clamping profile 520. More particularly, in the embodiment shown, the U-shaped central part 526 of the bottom 521 comes to rest on the pressing table 561, which preferably and as shown has a somewhat concave upper surface, fitting to the contour of this U-shaped bottom part 526. The placement tool 560 now moves further upwards, and presses the clamping profile 520 into the receiving space 510.

In figure 7B is shown that the clamping profile 520 has already been partly pressed into the receiving space 510 of the support 503 by the placement tool 560. In this case, the clamping profile 520 has folded the edge parts of the strips 2 of tarpaulin around the locking edges 514 and pressed into the receiving space 510. On positioning the strips of tarpaulin with respect to the support beam 503, the strips of tarpaulin were positioned such that the length of the strip parts now folded inwards correspond to the half of the circumference of the receiving space 510, i.e. the height of one side wall 512 plus half the width of the bottom 511, such that these strips 2 of tarpaulin now do not overlap each other anymore.

The placement tool 560 is pressed upwards further, into the receiving space 510. The form and dimensions of the clamping profile 520 are chosen to fit well with the form and dimensions of the receiving space 510, wherein, in the relaxed condition, the mutual distance between the two shoulders 524 is larger than the mutual distance between the two locking edges 514 of the receiving space 510. On the continuous pressing movement of the placement tool 560, the side walls 522 of the clamping profile 520 are thus pressed towards each other when they pass the locking edges 514. Eventually, when the shoulders 524 pass the locking edges 514, the clamping profile 520 relaxes, in which case the side walls 522 move outwards, towards the side walls 512 of the receiving space 510, in which case the shoulders 524 of the clamping profile 520 come to rest on the locking edges 514 of the receiving space 510.

Now, the placement tool 560 can be withdrawn from the clamping profile 520, in which case the locking edges 514 stop the shoulders 524 and thus stop the clamping profile 520, which remains behind in the receiving space 510. The edge parts of the strips 2 of tarpaulin are now locked between the side walls 512 of the receiving space 510 on the one hand and the side walls 522 of the clamping profile 520 on the other hand.

Subsequently, the locking profile 540 is placed on the placement tool 560, and the placement tool 560 is moved upwards again, in which case the placement tool 560 presses the locking profile 540 between the support edges 523 of the clamping profile 520, into the receiving space 527. This phase is illustrated in figure 7C.

Subsequently, the placement tool 560 can be withdrawn as illustrated in figure 7D, in which case the locking profile 540 is stopped by the support edges 523 of the clamping profile 520.

Preferably, the diameter of the locking profile 540 is chosen such that this is slightly larger than the available space between the side walls 522 in the receiving space 527. On passing the support edges 523, the locking profile 540 then is deformed somewhat to an ellipse-shaped contour, and the locking profile 540, in the receiving space 527, wants to relax to its original, substantially circular shape, in which case the locking profile 540 exerts forces directed away from each other on the inner surfaces of the side walls 522 of the clamping profile 520. In other words, the side walls 522 of the clamping profile 520 are pressed firmly outwards by the locking profile 540, against the side walls 512 of the receiving space 510, in which case the strips of tarpaulin are clamped firmly between the clamping profile 520 and the walls 512 of the receiving space 510.

An important advantage of this embodiment of the support beam 503 is that a possible pulling force which is exerted by a strip 2 of tarpaulin, as indicated in figure 6 with the arrow F, now has a main force component which is directed perpendicularly to the direction of the mouth 513, wherein with the direction of the mouth 513 is intended the

displacement direction which the locking profile 540 and the clamping profile 520 must undergo with respect to the receiving space 510 when they want to leave this receiving space 510. Thus, this direction corresponds to the direction of movement of the placement tool 560 as discussed with reference to the figures 7A-D.

Figure 8A is a cross-section of a sixth preferred embodiment of a support beam 603 proposed by the present invention. In the context of the present invention, this support beam 603 may be a solid support beam, but preferably the support beam 603 is formed as a hollow extrusion profile, as shown. The material of the support beam 603 is preferably aluminium or steel, but other materials are also possible. The support beam 603 may have a circular cylindrical contour. In the embodiment shown, the support beam 603 has a substantially triangular contour, with a substantially flat bottom wall 604, two side walls 605, and a rounded top wall part 606. Hereby, the advantage is inter alia achieved of a saving of material with respect to a circular-round contour.

The support beam 603 is suitable to be connected at any position with respect to a continuous tarpaulin, but this support beam is also suitable to be connected to two neighboring strips of tarpaulin. As in the case of the fifth embodiment described in the above, the support beam 603, for coupling with two neighboring strips of tarpaulin, has a single common receiving space 610 which is defined under the bottom wall 604 by two stops 607 projecting from the bottom wall 604. In the preferred embodiment shown, these stops 607 are formed as elongation of the respective side walls 605, such that these stops 607 are located at the ends of the bottom wall 604. Preferably, and as shown, the stops 607 are provided at their free ends directed away from the bottom 604 with locking edges 608 directed towards each other, such that the mutual distance between these locking edges 608, measured parallel to the bottom 604, is smaller than the mutual distance between the roots 609 of the stops 607, there where the stops 607 meet the bottom 604.

The support beam 603 is provided with a self-locking clamping strip or clamping profile 620, which comprises two clamping strip parts 621 coupled to each other in a pivoting manner. The clamping strip 620 is preferably implemented as an extrusion profile from metal, preferably aluminium or steel, but other materials are also possible. In the detailed drawing of figure 8B, it can be recognized that each clamping strip part 621 has a substantially L-shaped contour with a leg section 622 and a foot section 623. Each foot section 623 has a free end which will be indicated as toe section 624. The toe sections 624 of the clamping strip parts 621 are coupled to each other in a pivoting manner by a pivot device 625. The two clamping strip parts 621 may be separate parts, which are connected by a separate pivoting device 625. Preferably, however, the two clamping strip parts 621 and the pivoting device 625 are implemented as a single integrated part, i.e. the pivoting device 625 is a deformable material bridge between the two clamping strip parts 621.

The two clamping strip parts 621 can pivot with respect to each other over an angular range of about 180°. In a first extreme position, the leg sections 622 are located substantially aligned with each other, wherein heel parts 626 of the foot sections 623 lie against each other. In a second extreme position, the free ends 627 of the two leg sections 622 are located at a short distance from each other, or they even touch each other.

The length of the two clamping strip parts 621 is chosen such that their overall length in the first extreme position is substantially equal to, or even slightly larger than, the length of the receiving space 610.

Now, with reference to figures 9A-D, connecting two strips of tarpaulin to the support profile 603 will be described. It is noted in this respect that the same or similar operation may also be applied when connecting a continuous tarpaulin, so this is not illustrated separately.

In a first step (illustrated in figure 9A) the edge parts of two neighboring strips 2 of tarpaulin are placed over the receiving space 610 of the support beam 603. In this case, the dimension of a possible overlap or a possible mutual distance

is not critical. The clamping profile 620 is placed in front of the receiving space 610, with the toe sections 624 being directed towards the receiving space 610. The clamping profile 620 is located in a pivot position between the two said extreme positions, such that the two heel parts 626 are at a mutual distance.

In this case, the mutual distance between the two free ends 627 of the two leg sections 622 is smaller than the mutual distance of the stops 607, such that the clamping profile 620 can be pressed into the receiving space 610, in which case the two free ends 627 of the two leg sections 622 are pressed against the bottom 604, with the two strips of tarpaulin in between.

Then, a pressing force is exerted on the foot sections 623 in the direction of the bottom 604, such that the two clamping strip parts 621 pivot with respect to each other in the direction of the first extreme position. In this case, the two free ends 627 of the two leg sections 622 move away from each other, until they come to lie against the stops 607. In this case, the two strips of tarpaulin are folded over the stops 607, against the bottom 604. This situation is illustrated in figure 9B.

The pivoting clamping profile 620 is then still not in its first extreme position. In order to bring the pivoting clamping profile 620 in its first extreme position, a substantially larger pressing force is necessary. Figure 9B schematically shows a part of a pressing tool 660 which is movable up and down, which is capable to exert a sufficient pressing force F . The two free ends 627 of the two leg sections 622 then press against the stops 607 with ever increasing force, until the pivot 625 passes a plane defined by the two stops 607. The force exerted by the stops 607 on the two free ends 627 of the two leg sections 622 now cooperates to pivot the pivoting clamping profile 620 to its first extreme position, and to hold the pivoting clamping profile 620 in this first extreme position (figure 9C). Thus, the pivoting clamping profile 620 has self-locking properties.

In this condition, the strips of tarpaulin are clamped between the free ends 627 of the two leg sections 622 and the

stops 607. Depending on the precise dimensioning, the clamping force occurring in this case can be extremely large, much larger than the required pressing force F . The clamping force can be large to such extent that, under normal circumstances, it is not possible to pull free the strips of tarpaulin.

The same large clamping force achieves a locking of the clamping profile 620. The amount of locking depends inter alia on the distance between the pivot 625 and the said plane defined by the two stops 607, i.e. the length of the foot section 623, as will be clear to a person skilled in the art. In figure 8A is shown that the bottom 604 may be provided of a groove-shaped recess 628 for accommodating these foot sections.

If desired, it is possible to provide an even larger locking security by arranging a locking device 630 which is capable of accomplishing a mechanical coupling between the two clamping strip parts 621 to thus eliminate the pivot freedom of the two clamping strip parts 621. To this end, in the embodiment shown, recesses 629 corresponding to each other are arranged in the foot sections 623, which together, in the first extreme pivoting position, form a completely enclosed receiving space 631 for a locking strip 630, which in this case both have a rectangular contour. After snapping-in of the clamping profile 620 (figure 9C), this locking strip 630 can be inserted longitudinally into this receiving space 631.

An important advantage of this sixth embodiment is that placing the two strips of tarpaulin and clamping the two strips of tarpaulin to the carrier beam can take place in a single processing step.

Further, it is advantageous that the dimensioning of the receiving space 610 and the clamping strip 620 can be such that surfaces 622a of the leg sections 622, directed away from the bottom 604, can lie in one plane with each other and with the strips of tarpaulin. Hereby, an esthetically nice appearance is achieved, but this also makes it possible that the whole of strips of tarpaulin and carrier beams comes to lie as close as possible on the water surface, reducing the risk that the wind catches under the tarpaulin. Further, the chance on entry of dirt is relatively small.

Further it is advantageous that, in the assembled condition as shown in figure 8A, the lower end of the side wall 605 can make a relatively large angle with the strips of tarpaulin. In the embodiment illustrated in figure 8A, this angle is about 90°, but it can be even larger if desired. Hereby, the chance on collecting dirt is extremely small.

Figure 8C shows, in a larger scale, a detail of a variation of the clamping profile 620. Also in this case, recesses 629 corresponding to each other are arranged in the foot sections 623, but now the heel sections 626 are implemented shorter, such that they do not touch each other in the first extreme position. Then, the receiving space 631 is not completely enclosed in the first extreme position, but has a substantially T-shaped contour, wherein the leg of this T-shape is defined by the heel sections 626 located at a distance from each other, and thus is open at the free surface 622a of the clamping profile 620. A locking strip 630 with an adapted contour can now simply be snapped into this receiving space 631.

Figure 8D shows, in a larger scale, another detail of a variation of the clamping profile 620. In the embodiment of figure 8A, the outer surfaces 622a of the clamping profile 620 are in one line with the tarpaulin 2. In the embodiment of figure 8D, the leg sections 622 of the clamping profile 620, at the side of these outer surfaces 622a, always have an elongation 622b, which extends to about the outer edge of the support beam 603.

This elongation 622b functions as a protective edge for the tarpaulin 2, which prevents the tarpaulin 2 from getting between the support beam 603 and a support face and possibly getting damaged.

It will be clear to a person skilled in the art that the invention is not limited to the embodiments discussed in the above, but that several variations and modifications are possible within the protective scope of the invention as defined in the attached claims.

For instance, it is preferred that the support beams at their under side, at least at those parts with which the support beams rest on the swimming-pool edge, are provided with a protective cap or protective profile or protective strip or the like, serving to prevent damage and wear and tear of the beam and the swimming-pool edge. Such protective device can be connected to the beam by means of screws or the like, but preferably the support beam is provided with a fitting groove in which a connecting projection of the protective device fits, preferably in a clamping manner.

CLAIMS

1. Support beam (603) for a covering system, comprising a bottom wall (604) and a receiving space (610) associated with this bottom wall;
and a clamping profile (620) with a contour fitting to the receiving space (610), designed to be inserted into the receiving space (610) with a direction of movement perpendicular to the longitudinal direction of the support beam, and to clamp thereby at least one strip of tarpaulin between a wall part (607) of the receiving space (610) on the one hand and the clamping profile (620) on the other hand;
wherein the receiving space (610) is provided with two stops (607) projecting from the bottom wall (604);
and wherein the clamping profile (620) comprises two clamping strip parts (621) coupled pivotingly with each other;
wherein the clamping strip parts (621) are coupled to each other by a clamping device (625) which, in a clamping condition wherein the clamping strip parts (621) are clamped in the receiving space (610), is located at the side of the line which connects the free ends (627) of these clamping strip parts directed towards the support beam.
2. Support beam according to claim 1, wherein each clamping strip part (621) has a substantially L-shaped contour, with a leg section (622) and a foot section (623), and wherein the free ends (624) of the foot sections (623) are coupled pivotingly with each other by a pivoting device (625).
3. Support beam according to claim 2, wherein the two clamping strip parts (621) and the pivoting device (625) are implemented as a single integrated part, preferably an extrusion product.
4. Support beam according to claim 2 or 3, wherein the bottom wall (604) is provided with a groove-shaped recess (628) for accommodating the foot sections (623).

5. Support beam according to any of claims 1-4, wherein the stops (607) at their free ends, directed away from the bottom (604), are provided with locking edges (608) directed towards each other.
6. Support beam according to any of claims 1-5, wherein the stops (607) are formed as elongation of respective side walls (605) of the support beam (603).
7. Support beam according to claim 6, wherein said side walls (605) meet the bottom (604) under an angle of about 90° or less.
8. Support beam according to any of the previous claims 1-7, wherein the clamping strip parts (621) are provided with recesses (629) corresponding to each other, which together, in a first extreme pivoting position, form a receiving space (631) for a locking strip (630).
9. Support beam according to claim 8, wherein the receiving space (631) opens in the front face (622a) of the clamping strip (620).
10. Support beam according to claim 9, further provided with an ornamental strip or locking strip (630) fitting in said locking strip receiving space (631).
11. Support beam according to any of the previous claims, implemented as a hollow extrusion profile, preferably from aluminium or stainless steel.
12. Support beam according to any of the previous claims, further comprising two side walls (605) and a rounded top wall (606).
13. Support beam according to any of the previous claims, at its lower side, at least at those parts which are intended to rest on a swimming-pool edge (R), provided with a protective cap or protective profile or protective strip or the like,

which serves to prevent damage and wear and tear of the beam and the swimming-pool edge.

14. Support beam according to any of the previous claims, wherein the leg sections (622) of the clamping profile (620) are always provided with an elongation (622b).

15. Covering system, comprising a support beam according to any of the previous claims and at least one strip (2) clamped to this support beam.

16. Covering system according to claim 15, wherein a part of said strip is clamped-in between the clamping profile (620) and the stops (607) of the receiving space (610).

17. Covering system according to claim 16, wherein the clamped strip part is an edge part of said strip.

18. Support beam (503) for a covering system, comprising:
at least one receiving space (510);
a clamping profile (520) with a contour fitting to the receiving space (510);
and a locking profile (540), designed to press the clamping profile (520) against the receiving space (510).

19. Support beam according to claim 18, wherein the receiving space (510) has a substantially U-shaped contour with a bottom (511) and side walls (512).

20. Support beam according to claim 19, wherein the side walls (512) diverge from the bottom (511).

21. Support beam according to any of the previous claims 18-20, wherein the receiving space (510) has a mouth (513) with two locking edges (514) directed towards each other on opposite sides thereof.

22. Support beam according to any of the previous claims 18-21, wherein the bottom (511) is provided with a central longitudinal ridge (515).
23. Support beam according to any of the previous claims 18-22, wherein a bottom (511) and/or a side wall (512) of the receiving space (510) is provided with longitudinal ribs (516).
24. Support beam according to any of the previous claims 18-23, wherein the clamping profile (520) has a substantially U-shaped contour with a bottom (521) and side walls (522) diverging from the bottom (521).
25. Support beam according to claim 24, wherein the free ends of the side walls (522) of the clamping profile (520) are provided with support edges (523) directed towards each other.
26. Support beam according to claim 24 and 25, wherein the free end of a side wall (522) of the clamping profile (520) defines a shoulder (524).
27. Support beam according to any of the claims 24-26, wherein a longitudinal groove (525) is formed in the bottom (521) of the clamping profile (520).
28. Support beam according to any of the previous claims 18-27, wherein the locking profile (540) is a hollow profile with a substantially circular cylindrical contour.
29. Support beam according to any of the previous claims 18-28, wherein the clamping profile (520) has a receiving space (527) with an entry opening, and wherein the locking profile (540) has an outer diameter which is larger than the width of said entry opening.
30. Support beam according to any of the claims 24-29, wherein the locking profile (540) has a diameter which substantially

corresponds to the mutual distance between the side walls (522) of the clamping profile (520).

31. Support beam according to any of the previous claims 18-30, wherein the clamping profile (520) is positioned in the receiving space (510) of the support beam (503), and wherein the locking profile (540) is positioned in the receiving space (527) of the clamping profile (520).

32. Support beam according to claim 31, wherein the locking profile (540) clampingly fits in the clamping profile (520), and exerts forces directed away from each other on the side walls (522) of the clamping profile (520).

33. Support beam according to claim 31 and 32, wherein the shoulder (524) of the clamping profile (520) engages behind the locking edge (514) of the receiving space (510).

34. Covering system, comprising a support beam according to any of the previous claims 18-33 and at least one strip (2) connected to this support beam.

35. Covering system according to claim 34, wherein a part of said strip is clamped-in between the clamping profile (520) and the receiving space (510).

36. Covering system according to claim 35, wherein the clamped strip part is an edge part of said strip.

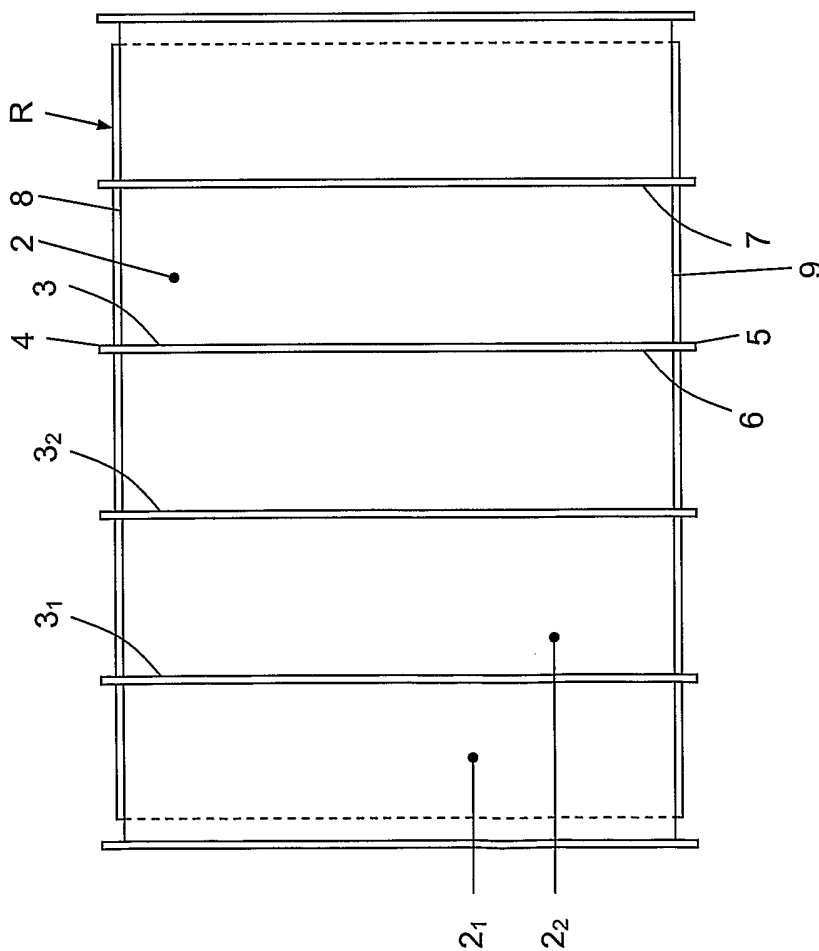
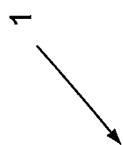


FIG. 1

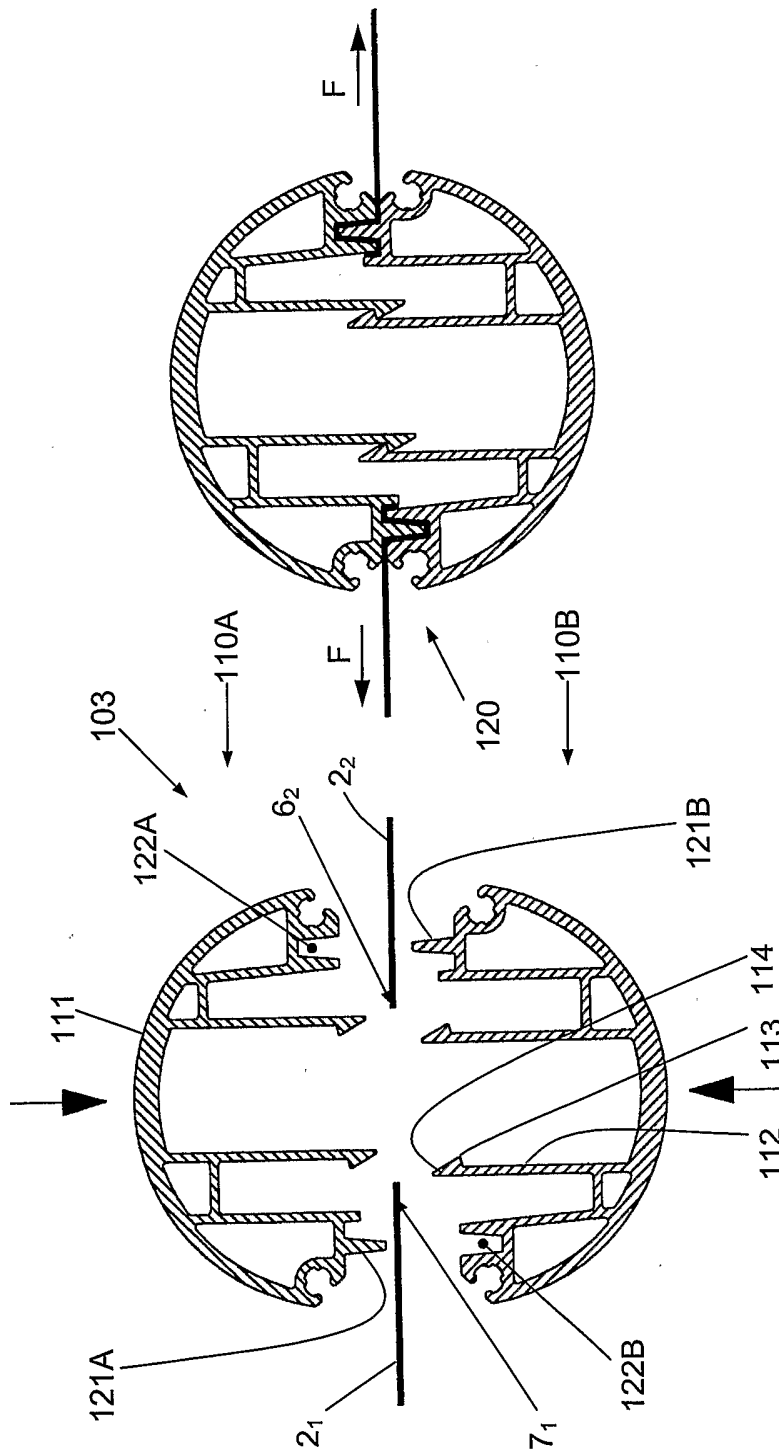


FIG. 2B

FIG. 2A

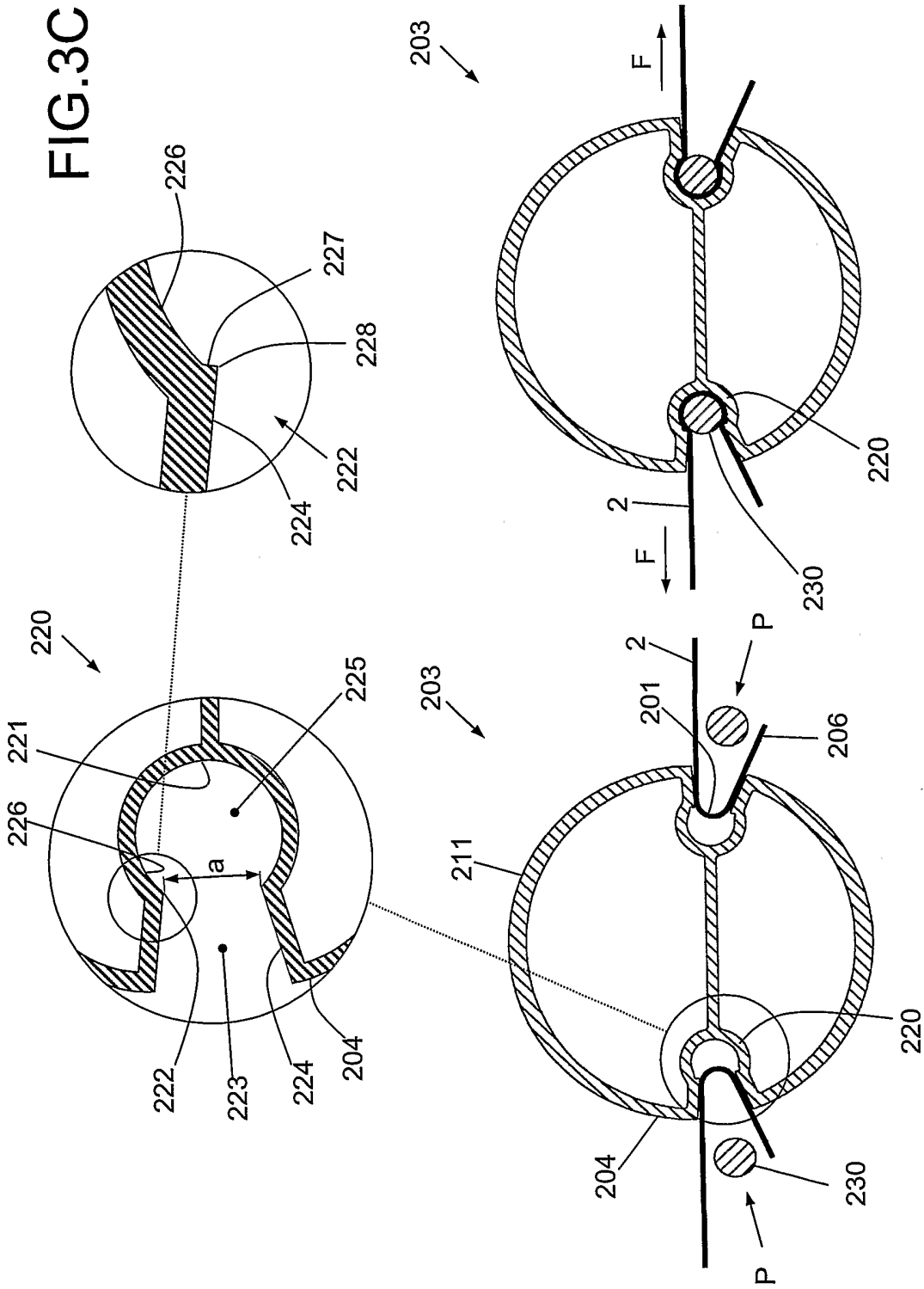


FIG. 3C

FIG. 3B

FIG. 3A

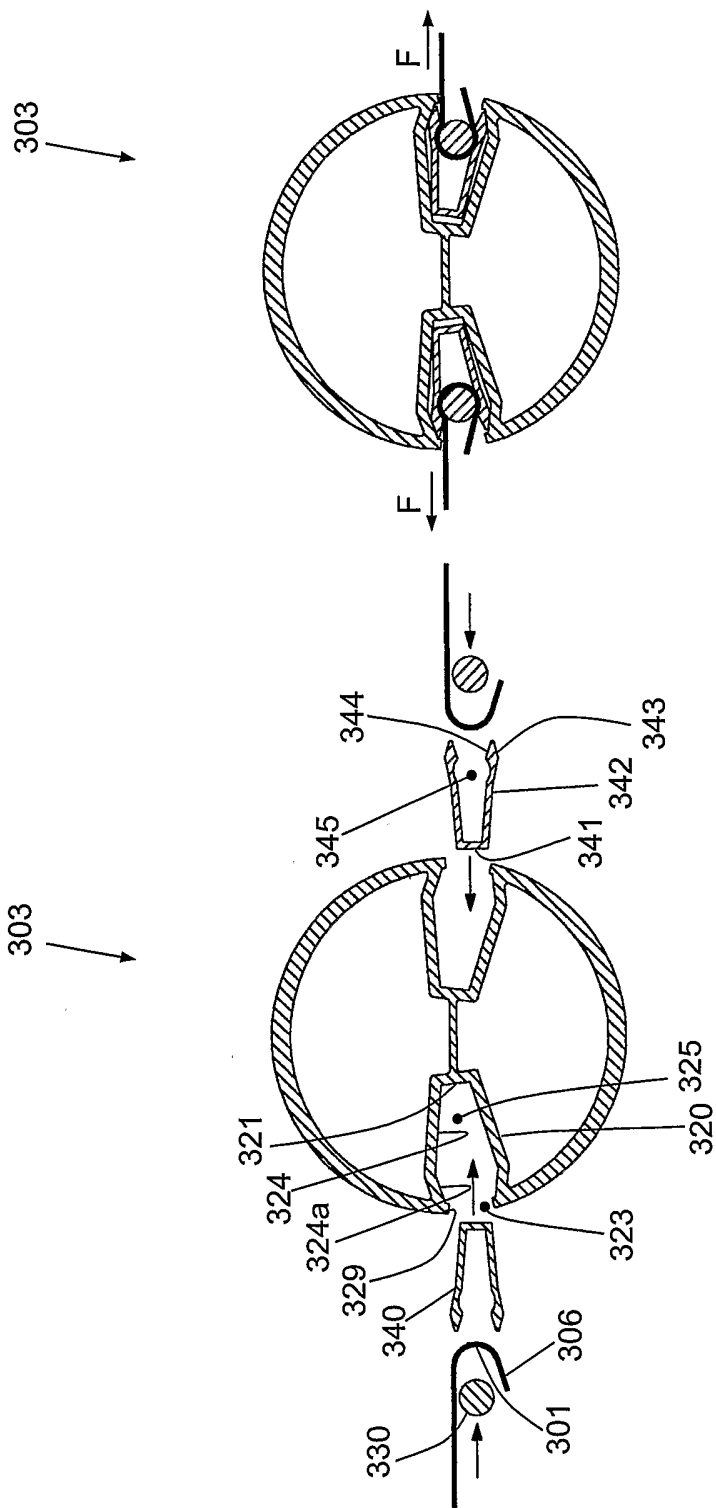


FIG. 4A

FIG. 4B

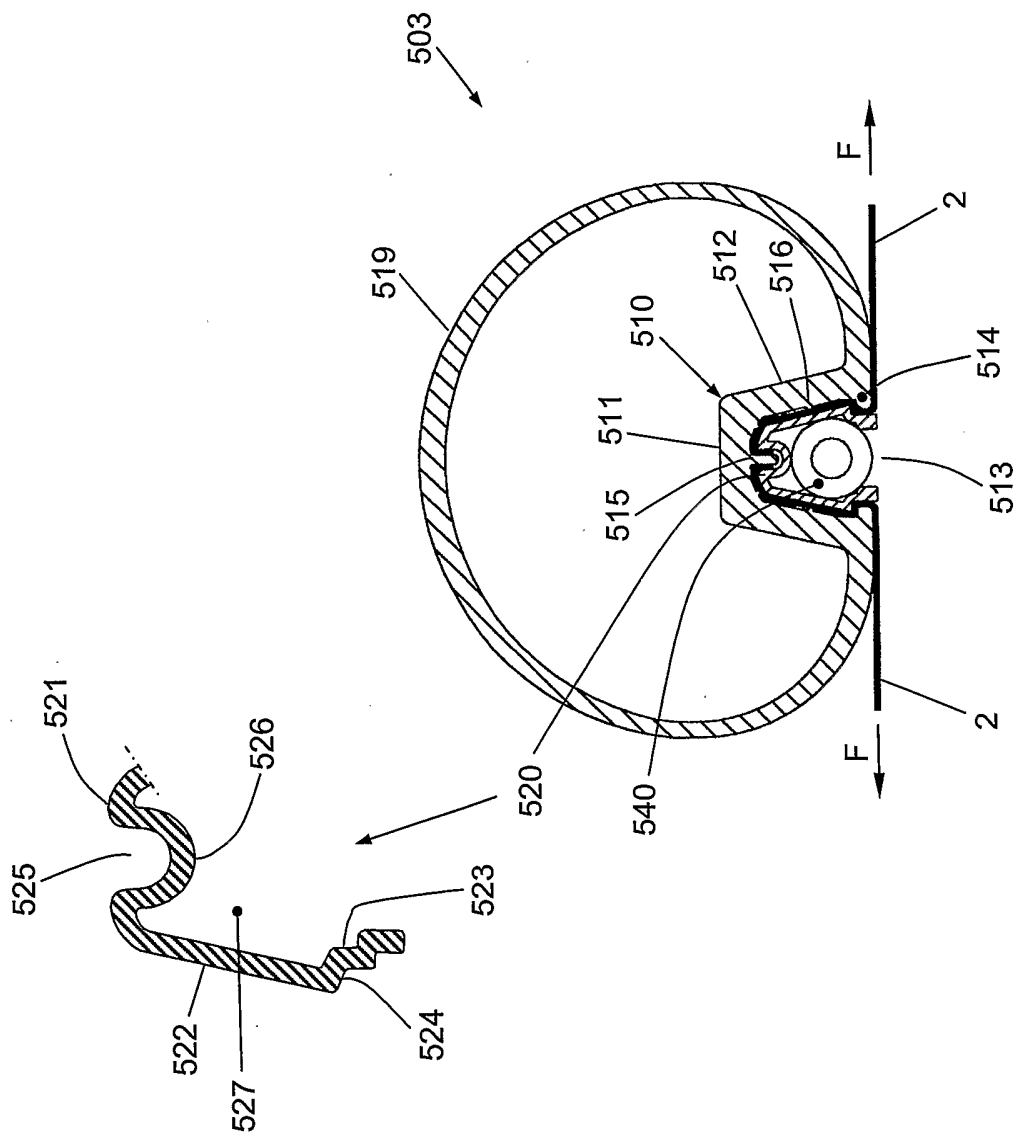


FIG. 6

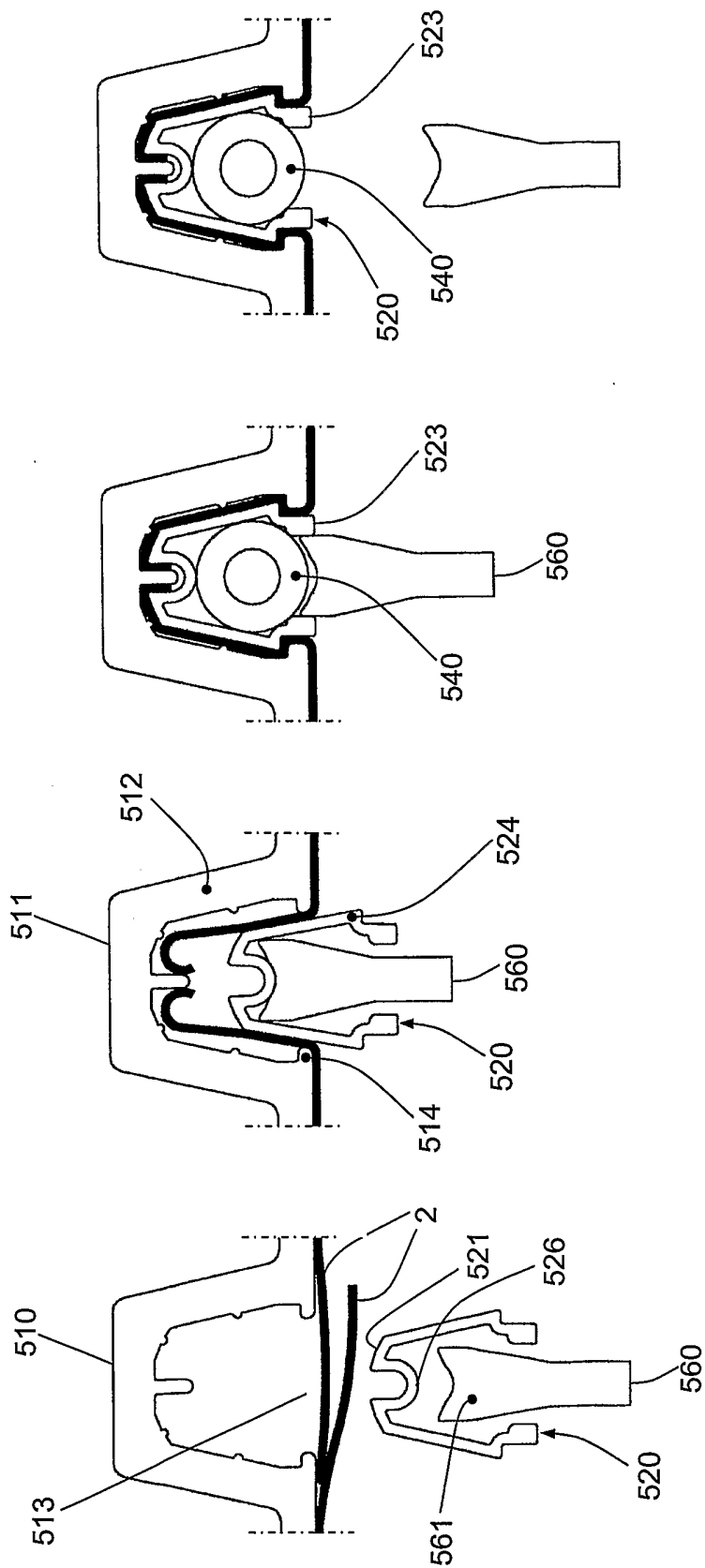


FIG. 7D

FIG. 7C

FIG. 7B

FIG. 7A

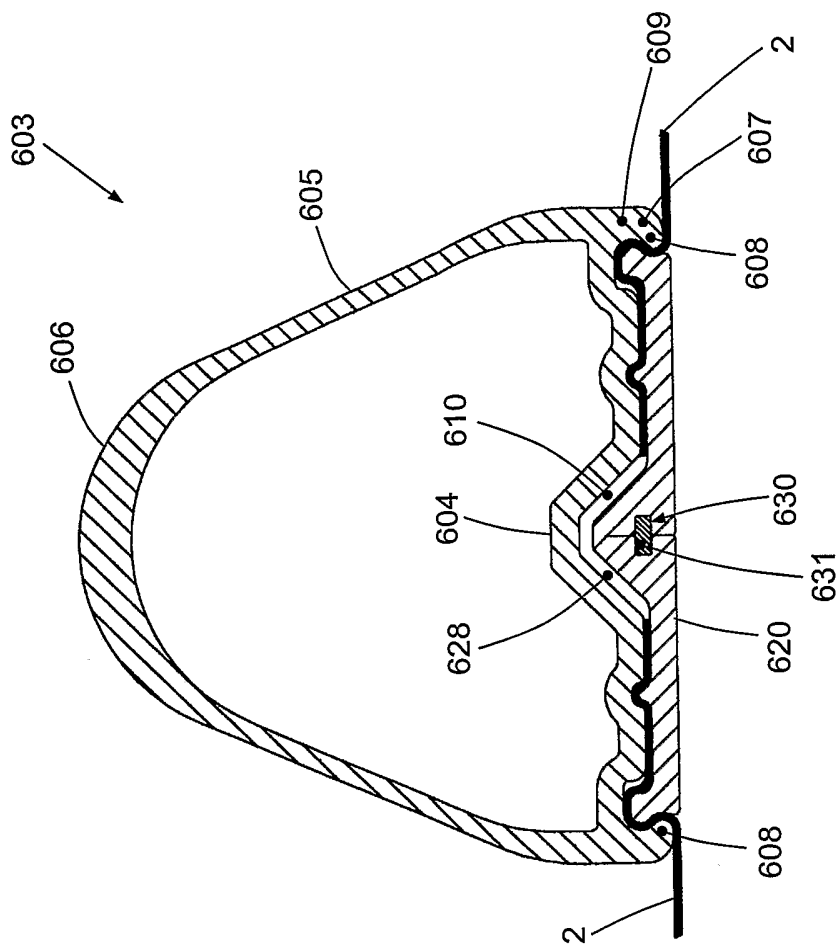


FIG. 8A

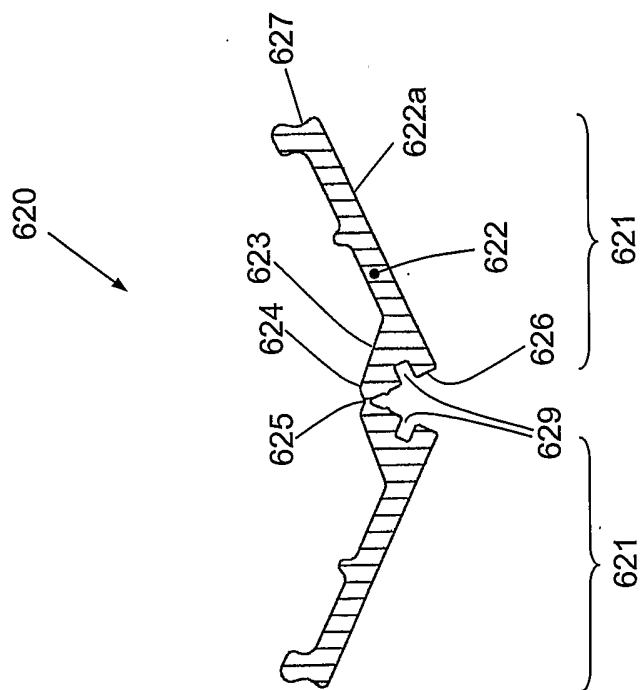


FIG. 8B

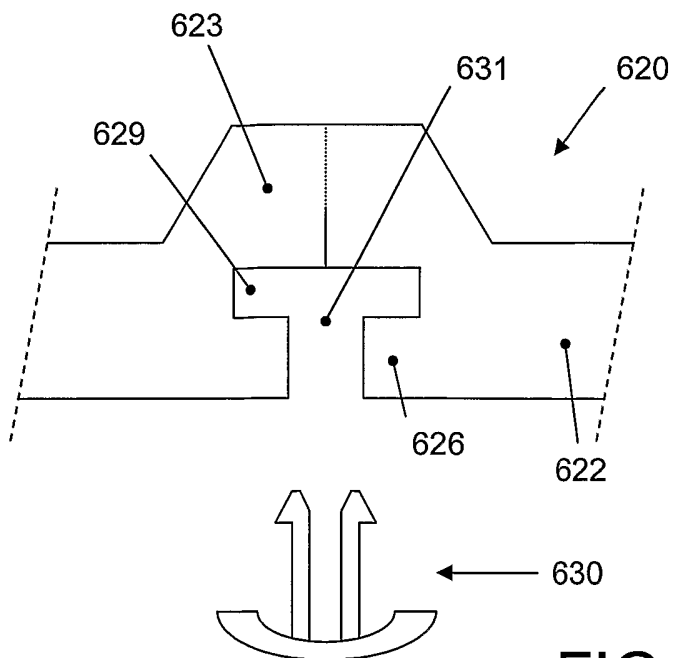


FIG. 8C

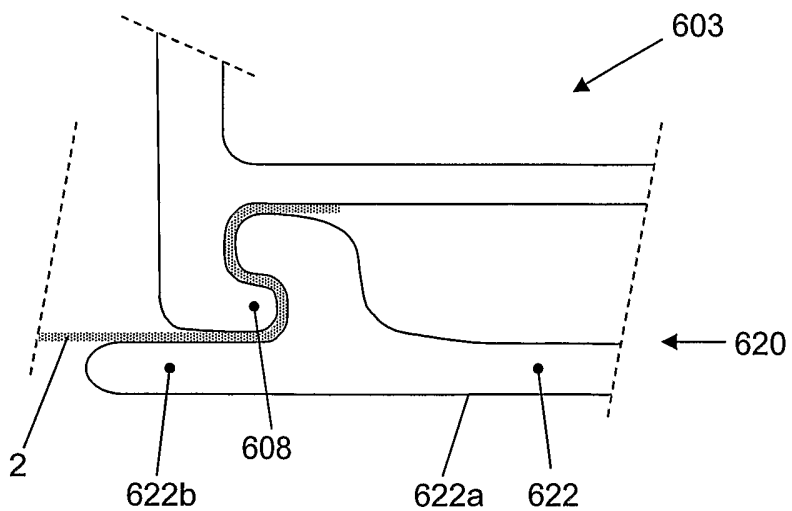


FIG. 8D

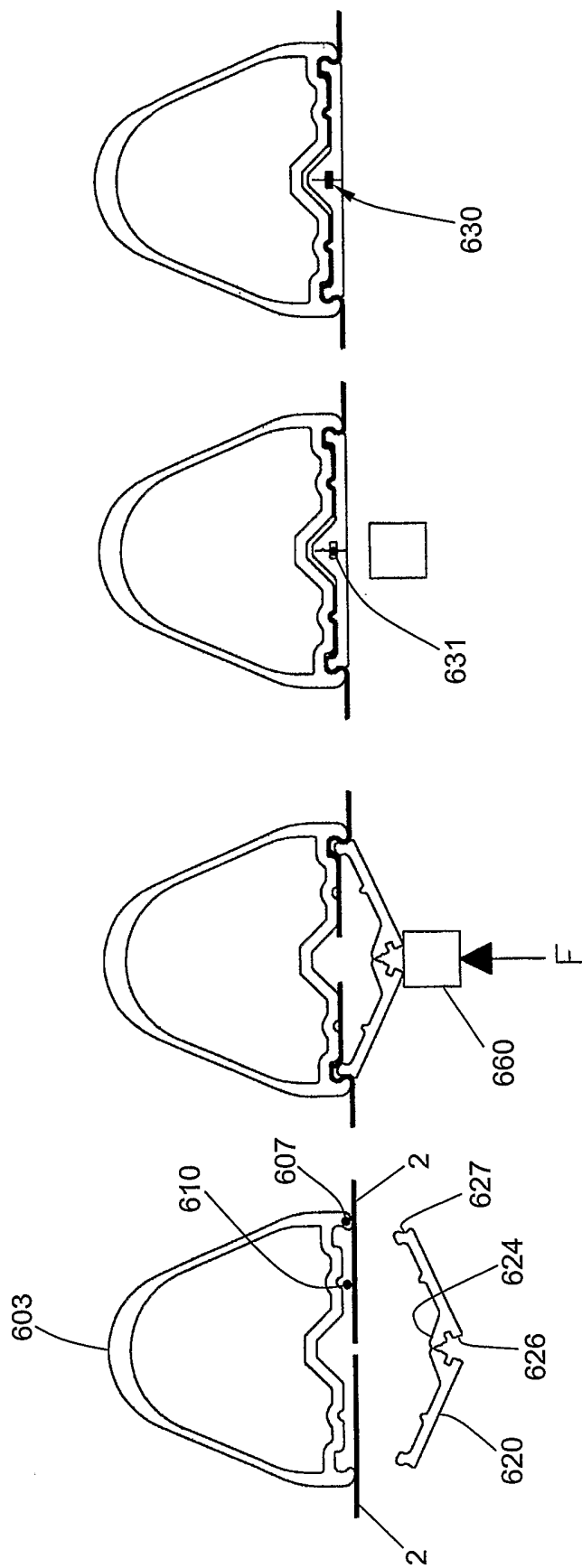


FIG. 9A

FIG. 9B

FIG. 9C

FIG. 9D

INTERNATIONAL SEARCH REPORT

Intern	Application No
PCT/NL 03/00529	

A. CLASSIFICATION OF SUBJECT MATTER
 IPC 7 E04H4/10 E04H15/64 F16B5/06

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED
 Minimum documentation searched (classification system followed by classification symbols)
 IPC 7 E04H F16B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)
 EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 5 242 004 A (STILLING JOHANN) 7 September 1993 (1993-09-07)	1, 11
X	column 5, line 12 -column 6, line 34; figures 3-5	15-17

A	FR 1 467 374 A (BOURDELLOT ROGER) 27 January 1967 (1967-01-27) cited in the application	1-3, 5, 6, 15
X	the whole document	18, 34-36

A	US 4 926 605 A (MILLIKEN LES ET AL) 22 May 1990 (1990-05-22)	1, 11
X	column 3, line 65 -column 4, line 28; figure 3	15-19, 21, 29, 34-36

-/--		

Further documents are listed in the continuation of box C. Patent family members are listed in annex.

* Special categories of cited documents :

A document defining the general state of the art which is not considered to be of particular relevance *E* earlier document but published on or after the international filing date *L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) *O* document referring to an oral disclosure, use, exhibition or other means *P* document published prior to the international filing date but later than the priority date claimed	*T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention *X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone *Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art. *Z* document member of the same patent family
---	---

Date of the actual completion of the international search 20 October 2003	Date of mailing of the international search report 27/10/2003
---	---

Name and mailing address of the ISA European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Authorized officer Vrugt, S
--	---

INTERNATIONAL SEARCH REPORT

Internation No	PCT/INL US/00529
----------------	------------------

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	EP 0 389 104 A (URQUHART PETER JOHN) 26 September 1990 (1990-09-26)	1, 11, 28
X	the whole document	15, 18, 24, 25, 29-33
A	<div style="text-align: center;">---</div> GB 2 138 882 A (ENDALL MONTAGU) 31 October 1984 (1984-10-31) the whole document <div style="text-align: center;">-----</div>	18, 28, 34-36

INTERNATIONAL SEARCH REPORT

Intern ication No
PCT/NL us/00529

Patent document cited in search report		Publication date	Patent family member(s)		Publication date
US 5242004	A	07-09-1993	CA	2087365 A1	22-07-1993
			JP	1984182 C	25-10-1995
			JP	5248049 A	24-09-1993
			JP	7006266 B	30-01-1995
			KR	132138 B1	18-04-1998
FR 1467374	A	27-01-1967	NONE		
US 4926605	A	22-05-1990	CA	1329108 C	03-05-1994
			US	5647176 A	15-07-1997
EP 0389104	A	26-09-1990	EP	0389104 A1	26-09-1990
GB 2138882	A	31-10-1984	NONE		