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(71) Applicant: **Indupack BV**
3920 Lommel (BE)

(72) Inventor: **VAN BAELEN, Vincent**
3920 Lommel (BE)

(74) Representative: **Arnold & Siedsma**
Bezuidenhoutseweg 57
2594 AC The Hague (NL)

(54) **ROAD PLATE COUPLING DEVICE**

(57) A road plate coupling device for releasably coupling two road plates, which road plates are provided with at least one passage opening extending through the road plate in a direction transversely of the road plate surface, wherein the road plate coupling device comprises a base and two road plate fastening means, wherein the two road plate fastening means are arranged on the base at a distance from each other and extend in a direction transversely of the base, wherein the two road plate fastening means each comprise a fastening part which is mounted movably on the respective road plate fastening means so that the fastening part is movable between an inserting position and a fastening position, wherein in the inserting position the fastening part and the respective road plate fastening means are insertable through the at least one passage opening and wherein in the fastening position the fastening part is movable so that the fastening part extends at least partially over the second side of the road plate.

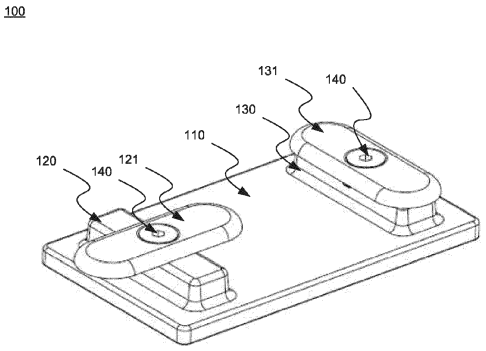

FIG. 4

EP 4 484 646 A1

Description

Field of the invention

[0001] The invention relates to a set of at least one road plate coupling device and at least two road plates. The invention further relates to a road plate coupling device.

Background

[0002] A road plate is a flat piece of metal or plastic which is used to create a temporary stable ground surface for vehicles, machines or persons at building sites, event locations or other areas with unstable or muddy ground. Road plates are usually used to distribute the load over a greater surface area and to prevent vehicles from sinking down or becoming stuck.

[0003] Road plates are often made of materials such as steel, aluminium or plastic, depending on the application and the required strength. They usually have a rectangular form, with rounded corners and reinforced edges in order to increase durability. Road plates can have different sizes, depending on the specific requirements, and can be combined to cover a greater surface area.

[0004] The use of road plates can help in preventing damage to the ground, facilitating access for vehicles and creating a safer environment for pedestrians. They are often used in the construction industry, in pipe-laying, at festivals and concerts, and in other situations where temporary paving of the ground surface is necessary.

[0005] It is time-consuming to attach road plates to each other. Traditional road plates are often coupled to each other using coupling pieces or connecting pins. This requires time and effort, especially when a large number of plates is needed.

Summary of the invention

[0006] Embodiments of the invention have the object of providing a road plate coupling device and road plates which enable simpler and quicker mutual coupling.

[0007] According to a first aspect, a set of at least one road plate coupling device and at least two road plates is provided. The road plates are provided with at least one passage opening which extends through the road plate in a direction transversely of the road plate surface. The road plate coupling device comprises a base and two road plate fastening means. The two road plate fastening means are arranged on the base at a distance from each other and extend in a direction transversely of the base. The two road plate fastening means each comprise a fastening part which is mounted movably on the respective road plate fastening means so that the fastening part is movable between an inserting position and a fastening position. In the inserting position the fastening part and the respective road plate fastening means are insertable through the at least one passage opening so that in the inserted position the base is situated on a first side of the road plate and the fastening part is situated on a second side of the road plate. In the fastening position the fastening part extends at least partially over the second side of the road plate.

[0008] The advantage of the road plate coupling device with base and two road plate fastening means is that the road plate coupling device provides for a simple and rapid fastening of the road plates. Owing to the movable road plate fastening means, the road plate fastening means can be inserted easily into the road plates and subsequently fastened in the fastening position. This is because the fastening part and the respective road plate fastening means can be inserted through the passage opening in simple manner in the inserting position, whereby the base is situated on one side of the road plate and the fastening part on the other side. In the fastening position the fastening part extends at least partially over the second side of the road plate, in which way the road plate is clamped between the base and the road plate fastening means, resulting in a stable connection. This provides for a reliable and durable anchoring of the road plates, whereby they remain firmly in place and form a solid ground surface for vehicles, machines and persons.

[0009] The at least one passage opening of each road plate is preferably an elongate passage opening which is longer than it is wide. The elongate passage opening lies substantially parallel to an edge of a road plate. In this way an efficient and convenient manner of manually transporting the road plates is provided. The elongate form makes it possible to grip the passage opening along the edge of the road plate in simple manner.

[0010] The fastening part is preferably elongate, wherein the fastening part is longer than it is wide and preferably has a length which is greater than 50% of the width of the passage opening. This elongate design of the fastening part provides for a strong and reliable fastening of the road plates. Owing to the elongate form, a greater area of the road plate is covered, which creates a stronger connection between the fastening part and the road plate. This contributes to the stability and durability of the fastening, whereby the road plates remain firmly in place even when subjected to heavy loads or movements. The elongate fastening part furthermore increases the ability to withstand shifting or detaching of the road plate. Covering a large part of the width of the passage opening prevents the road plate from coming loose or moving easily when forces are exerted thereon. This results in a stable and safe ground surface which is suitable for different uses. Owing to the elongate design of the fastening part, the road plate coupling device provides a strong and reliable connection between the road plates. This increases the stability, durability and safety of the road plates in use under different conditions and loads.

[0011] The fastening part is more preferably mounted movably on a shaft so that the fastening part is rotatable between the inserting position and the fastening position.

In this way the fastening part provides additional flexibility and convenience in fastening of the road plates. In the inserting position the fastening part can be rotated so that it can be inserted easily through the passage opening. This facilitates the process of placing and positioning the road plate, which enables an efficient installation. Once inserted, the fastening part can be rotated to the fastening position. The fastening part is secured firmly to the road plate by the rotation, this resulting in a strong and stable connection. This results in road plates remaining in place, even when subjected to loads or movements. The fastening part mounted rotatably on the shaft also provides flexibility in dismantling or removal of the road plates. By rotating the fastening part back to the inserting position the road plate can be easily released and removed, this simplifying the process of displacing or repositioning the road plates.

[0012] In short, the use of a rotatable fastening part in the road plate coupling device provides convenience, flexibility and a strong connection. It facilitates installation, enables stable fastening and simplifies the process of displacing or removing the road plates when necessary.

[0013] The road plate coupling device preferably further comprises a fixing means which is configured to releasably fix the fastening part relative to the respective road plate fastening means, wherein the fixing means has a fixing position and an open position, wherein in the fixing position the fixing means fixes the fastening part in one of the inserting position and the fastening position and wherein in the open position of the fixing means the fastening part is free to move between the inserting position and the fastening position. The fixing means provides additional stability and security in fastening of the road plates. In the fixing position the fixing means holds the fastening part firmly in place, whereby the road plate remains firmly connected and does not shift or detach. This contributes to the stability and safety of the road plates, especially in use under conditions with heavy loads or vibrations. At the same time, the fixing means provides freedom of movement when necessary. In the open position of the fixing means the fastening part can move freely between the inserting position and the fastening position, enabling simple assembly, disassembly and repositioning of the road plates. With this fixing means the user can fix road plates safely and firmly when necessary, while also keeping the flexibility of making adjustments or modifications as desired. This results in a practical and versatile application of the road plate coupling device.

[0014] The fastening part preferably has a dimension which is smaller than the elongate passage opening, whereby the fastening part can be inserted through the passage opening without problem. Making the fastening part smaller than the passage opening enables a smooth and easy insertion of the fastening part. This enables the fastening part to be slid through the passage opening unimpeded, this simplifying installation and fastening of the road plates. This dimensional ratio ensures a good fit between the fastening part and the passage opening, whereby a strong and safe fastening is achieved. Although the fastening part is smaller than the passage opening, it is preferred for the fastening part to still be sufficiently large to bring about a sturdy connection between the road plate and the road plate coupling device. Making the fastening part smaller furthermore facilitates the disassembly or removal of the road plate when necessary. All in all, the use of a smaller fastening part in relation to the passage opening provides advantages in respect of simple insertion, proper fit and easy removal of the road plates. This contributes to the efficiency, durability and user friendliness of the road plate coupling device.

[0015] The road plate fastening means preferably have a second dimension which is smaller than the passage opening so that in the inserted position there is a space between the road plate and the inserted road plate fastening means, wherein the space is measured between respective peripheral walls of the road plate and the inserted road plate fastening means.

[0016] The road plate fastening means preferably have a second dimension which is smaller than the passage opening, which results in a space between the road plate and the inserted road plate fastening means when they are in the inserted position. This space is measured between the respective peripheral walls of the road plate and the inserted road plate fastening means. Having a second dimension which is smaller than the passage opening creates an intentional opening or space between the road plate and the inserted road plate fastening means. This space provides several advantages. Firstly, it can serve as a buffer zone for absorbing shocks, vibrations or impact, this reducing the load on the road plate and the fastening means. This contributes to the durability and stability of the system. In addition, the presence of the space enables the road plate to move or expand/shrink under temperature changes or other environmental factors to some extent, without there being any direct contact with the fastening means. This helps reduce stresses and possible damage due to thermal expansion or contraction.

[0017] In short, the presence of a space between the road plate and the inserted road plate fastening means provides advantages such as shock damping, flexibility in the event of temperature changes and accessibility for inspection and maintenance. This contributes to an optimal performance and long lifespan of the road plate coupling device.

[0018] The first dimension and optionally the second dimension is preferably at least 2 mm smaller than the passage opening, preferably at least 5 mm smaller.

[0019] A peripheral edge of the fastening part is preferably chamfered at the position of an upper outer end. The peripheral edge of the fastening part preferably has a chamfering, particularly at the upper outer end.

[0020] Arranging a chamfering on the peripheral edge

of fastening part creates an oblique or sloping angle. This chamfering can provide various advantages in the context of the road plate coupling device. The chamfering thus reduces the chances of injury or wounding due to sharp edges. This reduces the risk of cuts or unintended contact with the sharp edges of the fastening part. The same is true for tyres of vehicles that could become damaged by a sharp edge. The chamfering facilitates insertion of the fastening part into the passage opening. Owing to the chamfered edge, the fastening part can slide through the opening more smoothly and easily, this making the installing and fastening procedure more efficient. The chamfering can also contribute to a reduction in friction between the fastening part and the edges of the passage opening. This can reduce the resistance during insertion and result in a smoother movement of the fastening part. Chamfering the peripheral edge of the fastening part also enables the structural integrity and durability of the component to be improved. The chamfering can reduce the stresses on the edges and avoid possible stress concentration points, this reducing the chances of damage or failure due to fatigue.

[0021] The fastening part preferably further comprises an aligning means which is configured to align the fastening part relative to the respective road plate fastening means in at least one of the inserting position and the fastening position. The aligning means has the object of ensuring that the fastening part is correctly aligned with the corresponding road plate fastening means during installation and fastening. This contributes to an accurate positioning and correct operation of the road plate coupling device. By making use of an aligning means the correct orientation and angle of the fastening part relative to the road plate fastening means can for instance be guaranteed. This is particularly important when the fastening part is rotatable, as stated above. The aligning means helps to ensure that the fastening part is aligned and positioned in the correct way so that it is able to rotate correctly between the inserting position and the fastening position. The use of an aligning means can also facilitate the installation procedure and improve accuracy. It helps in guiding and positioning of the fastening part, this reducing the chances of incorrect alignment or assembly errors.

[0022] More preferably, the aligning means extends from a lower side in a direction of the road plate fastening means and the road plate fastening means comprises a recess which is congruent with the aligning means, so that the aligning means can be arranged in the recess. Placing the aligning means on the lower side and having it extend in the direction of the road plate fastening means makes a clear guiding and alignment between the two components possible. The recess in the road plate fastening means, which has the shape of the aligning means, functions as a fitting space in which the aligning means fits precisely. This ensures a strong and accurate connection between the fastening part and the road plate fastening means. The use of an aligning means and a corresponding recess provides multiple advantages. It facilitates installation of the fastening part and ensures that it is correctly placed and aligned with the road plate fastening means. This reduces the chances of installation errors and improves the accuracy and stability of the road plate coupling device. The aligning means can furthermore help to uniformly distribute the load over the fastening part and the road plate fastening means, this increasing the durability and reliability of the coupling device.

[0023] The aligning means is more preferably smaller than a width of the passage opening. By making the aligning means smaller than a width of the passage opening no unevenness will result on the upper surface of the road plate when the fastening part is in the fastening position. In this way the aligning means extends in the space located between the road plate fastening means and the wall of the road plate.

[0024] The distance between the two road plate fastening means is preferably greater than the shortest distance between two adjacent passage openings of the two road plates, preferably at least 3 cm greater.

[0025] According to a further aspect, a road plate coupling device for releasably coupling two road plates is provided, which road plates are provided with at least one passage opening extending through the road plate in a direction transversely of the road plate surface, wherein the road plate coupling device comprises a base and two road plate fastening means, wherein the two road plate fastening means are arranged on the base at a distance from each other and extend in a direction transversely of the base, wherein the two road plate fastening means each comprise a fastening part which is mounted movably on the respective road plate fastening means so that the fastening part is movable between an inserting position and a fastening position, wherein in the inserting position the fastening part and the respective road plate fastening means are insertable through the at least one passage opening so that in the inserted position the base is situated on a first side of the road plate and the fastening part is situated on a second side of the road plate, and wherein in the fastening position the fastening part is movable so that the fastening part extends at least partially over the second side of the road plate.

Brief description of the figures

[0026] The above and other advantageous features and objectives of the invention will become more apparent and the invention better understood with reference to the following detailed description when read in combination with the accompanying drawings, in which:

Figure 1 illustrates a schematic cross-section of two road plates and a road plate coupling device according to an exemplary embodiment;

Figure 2 illustrates the road plates and road plate coupling device illustrated in figure 1 in the inserted

position;

Figure 3 shows the road plates and road plate coupling device illustrated in figures 1 and 2 in a fastening position;

Figure 4 shows a perspective view of a road plate coupling device with a first road plate fastening means in the fastening position and a second road plate fastening means in the inserting position; and

Figure 5 shows a perspective view of a first road plate which is coupled to a road plate coupling device and a second road plate which is still being arranged on said road plate coupling device.

Detailed embodiments

[0027] The following detailed description relates to determined specific embodiments. The teaching hereof can however be applied in different ways. The same or similar elements are designated in the drawings with the same reference numerals.

[0028] The present invention will be described with reference to specific embodiments. The invention is however not limited thereto, but solely by the claims.

[0029] As used here, the singular forms "a" and "the" comprise both the singular and plural references, unless clearly indicated otherwise by the context.

[0030] The terms "comprising", "comprises" and "composed of" as used here are synonymous with "including". The terms "comprising", "comprises" and "composed of" when referring to stated components, elements or method steps also comprise embodiments which "consist of" the components, elements or method steps.

[0031] The terms first, second, third and so on are further used in the description and in the claims to distinguish between similar elements and not necessarily to describe a sequential or chronological order, unless this is specified. It will be apparent that the thus used terms are mutually interchangeable under appropriate circumstances and that the embodiments of the invention described here can operate in an order other than described or illustrated here.

[0032] Reference in this specification to "one embodiment", "an embodiment", "some aspects", "an aspect" or "one aspect" means that a determined feature, structure or characteristic described with reference to the embodiment or aspect is included in at least one embodiment of the present invention. The manifestations of the sentences "in one embodiment", "in an embodiment", "some aspects", "an aspect" or "one aspect" in different places in this specification thus do not necessarily all refer to the same embodiment or aspects. As will be apparent to a skilled person in this field, the specific features, structures or characteristics can further be combined in any suitable manner in one or more embodiments or aspects. Although some embodiments or aspects described here comprise some but no other features which are included in other embodiments or aspects, combinations of features of different embodiments or aspects are further intended to fall within the context of the invention and to form different embodiments or aspects, as would be apparent to the skilled person. In the appended claims all features of the claimed embodiments or aspects can for instance be used in any combination.

[0033] The same or similar elements are designated in the drawing with the same reference numerals.

[0034] Figure 1 illustrates a schematic cross-section of a set of two road plates 201, 202 and a road plate coupling device 100 according to an exemplary embodiment. The road plates 201, 202 are provided with at least one passage opening 211, 212 extending through the road plate in a direction transversely of the road plate surface. It will be apparent that more than one passage opening can be provided in each road plate. Figure 5 for instance shows that two passage openings are provided at the position of the end edges of each road plate 201, 202. It will further be apparent that passage openings can also be provided at positions other than an end edge, for instance at the position of the lateral edges of a road plate (not shown).

[0035] The road plate coupling device 100 shown in figures 1, 2, 3 and 4 comprises a base 110 and two road plate fastening means 120, 130. The two road plate fastening means 120, 130 are arranged on the base at a distance A1 from each other and extend in a direction transversely of the base. The two road plate fastening means 120, 130 each comprise a fastening part 121, 131 which is mounted movably on the respective road plate fastening means 120, 130. The first road plate fastening means 120 thus comprises a first fastening part 121 and the second road plate fastening means 130 a second fastening part 131. The first and the second fastening part 121, 131 are movable relative to their corresponding road plate fastening means 120, 130 so that the fastening parts 121, 131 are movable between an inserting position and a fastening position. The inserting position is shown in figures 1, 2, 4 and 5. In figures 1 and 2 both fastening parts 121, 131 are in the inserting position. In figures 4 and 5 only the second fastening part 131 is in the inserting position. In the inserting position the fastening part 121, 131 and the respective road plate fastening means 120, 130 are insertable through the at least one passage opening 211, 212. It will be apparent here that the first road plate fastening means 120 and the first fastening part 121 is inserted through the passage opening 211 of the first road plate 201 and that the second road plate fastening means 130 and the second fastening part 131 is inserted through the passage opening 212 of the second road plate 201. This is illustrated in figure 5. In the inserted position, which inserted position is shown in figures 2 and 3, the base 110 is situated on a first side S1 of the road plate 201, 202 and the fastening part 121, 131 is situated on a second side S2 of road plate 201, 202. In the fastening position the fastening part 121, 131 extends at least partially over the second side S2 of the road plate so that the fastening part clamps the road plate between

the base and the fastening part. In this way the road plate coupling device 100 provides a simple and rapid fastening of road plates 201, 202. Owing to the movable road plate fastening means 121, 131, the road plate fastening means can be easily inserted into the road plates 201, 202 and subsequently fastened in the fastening position. This is because the fastening part 121, 131 and the respective road plate fastening means 120, 130 can be inserted through the passage opening 211, 212 in simple manner in the inserting position, whereby the base 110 is situated on the one side of the road plate and the fastening part on the other side. In the fastening position the fastening part extends at least partially over the second side of the road plate, the road plate being clamped between the base and the road plate fastening means in this way, this resulting in a stable connection through the base 110. This provides for a reliable and durable anchoring of the road plates 201, 202, whereby they remain firmly in place and form a solid ground surface for vehicles, machines and persons.

[0036] As shown in figure 5, the at least one passage opening 211, 212 of each road plate 201, 202 is preferably an elongate passage opening 211, 212 which is longer than it is wide. The elongate passage opening 211, 212 lies substantially parallel to an edge of a road plate. In this way an efficient and convenient manner of manually transporting the road plates 201, 202 is provided. The elongate form makes it possible to grip the passage opening 211, 212 along the edge of the road plate in simple manner.

[0037] Figures 3, 4 and 5 further show that the fastening part 121, 131 is preferably also elongate, wherein the fastening part 121, 131 is longer than it is wide and preferably has a length which is greater than 50% of the width of the passage opening 211, 212. This elongate fastening part 121, 131 provides for a strong and reliable fastening of the road plates 201, 202. Owing to the elongate form a greater surface area of the road plate 201, 202 is covered, which creates a stronger connection between the fastening part 121, 131 and the road plate. This contributes to the stability and durability of the fastening, whereby road plates 201, 202 remain firmly in place, even when subjected to heavy loads or movements. The elongate fastening part 121, 131 furthermore increases the ability to withstand shifting or detaching of the road plate. Covering a large part of the width of the passage opening 211, 212 prevents the road plate from coming loose or moving easily when forces are exerted thereon. This results in a stable and safe ground surface which is suitable for different uses. Owing to the elongate design of the fastening part 121, 131, the road plate coupling device 100 provides a strong and reliable connection between the road plates 201, 202. This increases the stability, durability and safety of road plates 201, 202 in use under different conditions and loads.

[0038] Figures 4 and 5 further show that the fastening part 121, 131 is mounted movably on a shaft so that the fastening part 121, 131 is rotatable between the inserting position and the fastening position. In this way the fastening part 121, 131 provides additional flexibility and convenience in the fastening of road plates 201, 202. In the inserting position the fastening part 121, 131 can be rotated so that it can be inserted easily through passage opening 211, 212, as shown in figures 1, 2 and 5. It is noted that in figure 5 only the second fastening part 131 is in the inserting position. This facilitates the process of placing and positioning the road plate 201, 202, enabling an efficient installation. Once inserted, the fastening part 121, 131 can be rotated to the fastening position. The fastening part 121, 131 is secured firmly to the road plate by the rotation, resulting in a strong and stable connection. This results in road plates 201, 202 remaining in place, even when subjected to loads or movements. The fastening part 121, 131 mounted rotatably on the shaft also provides flexibility in dismantling or removal of road plates 201, 202. By rotating fastening part 121, 131 back to the inserting position the road plate can be easily released and removed, this simplifying the process of displacing or repositioning the road plates 201, 202. In short, the use of a rotatable fastening part 121, 131 in the road plate coupling device 100 provides convenience, flexibility and a strong connection. It simplifies installation, enables stable fastening and simplifies the process of displacing or removing road plates 201, 202 when necessary.

[0039] Figures 4 and 5 further show that the road plate coupling device 100 preferably further comprises a fixing means 140 which is configured to releasably fix the fastening part 121, 131 relative to the respective road plate fastening means 120, 130, wherein the fixing means 140 has a fixing position and an open position, wherein in the fixing position the fixing means 140 fixes the fastening part 121, 131 in one of the inserting position and the fastening position and wherein in the open position of the fixing means the fastening part 121, 131 is free to move between the inserting position and the fastening position. The fixing means 140 provides additional stability and security in fastening of road plates 201, 202. In the fixing position the fixing means 140 holds the fastening part 121, 131 firmly in place, whereby the road plate remains firmly connected and does not shift or detach. This contributes to the stability and safety of road plates 201, 202, especially in use under conditions with heavy loads or vibrations. At the same time, the fixing means provides freedom of movement when necessary. In the open position of the fixing means the fastening part 121, 131 can move freely between the inserting position and the fastening position, enabling simple assembly, disassembly and repositioning of road plates 201, 202. With this fixing means the user can fix road plates 201, 202 safely and firmly when necessary, while also keeping the flexibility of making adjustments or modifications as desired. This results in a practical and versatile application of road plate coupling device 100.

[0040] It is further visible in figures 1 and 2 that the fastening part 121, 131 has a dimension which is smaller

than the elongate passage opening 211, 212, whereby the fastening part 121, 131 can be inserted through the passage opening 211, 212 without problem. Making the fastening part 121, 131 smaller than the passage opening 211, 212 enables a smooth and easy insertion of fastening part 121, 131. This enables the fastening part 121, 131 to be slid through the passage opening 211, 212 unimpeded, this simplifying installation and fastening of road plates 201, 202. This dimensional ratio ensures a good fit between fastening part 121, 131 and passage opening 211, 212, whereby a strong and safe fastening is achieved. Although the fastening part 121, 131 is smaller than the passage opening 211, 212, it is preferred for the fastening part 121, 131 to still be sufficiently large to bring about a study connection between the road plate and the road plate coupling device 100. Making the fastening part 121, 131 smaller furthermore facilitates the disassembly or removal of the road plate when necessary. All in all, the use of a smaller fastening part 121, 131 in relation to the passage opening 211, 212 provides advantages in respect of simple insertion, proper fit and easy removal of road plates 201, 202. This contributes to the efficiency, durability and user friendliness of the road plate coupling device 100. The road plate fastening means preferably have a second dimension which is smaller than the passage opening 211, 212, so that in the inserted position there is a space between the road plate and the inserted road plate fastening means, wherein the space is measured between respective peripheral walls of the road plate and the inserted road plate fastening means. Having a second dimension which is smaller than the passage opening 211, 212 creates an intentional opening or space between the road plate and the inserted road plate fastening means. This space provides several advantages. Firstly, it can serve as a buffer zone for absorbing shocks, vibrations or impact, this reducing the load on the road plate and the fastening means. This contributes to the durability and stability of the system. In addition, the presence of the space enables the road plate to move or expand/shrink under temperature changes or other environmental factors to some extent, without there being any direct contact with the fastening means. This helps reduce stresses and possible damage due to thermal expansion or contraction.

[0041] In short, the presence of a space between the road plate and the inserted road plate fastening means provides advantages such as shock damping, flexibility in the event of temperature changes and accessibility for inspection and maintenance. This contributes to an optimal performance and long lifespan of the road plate coupling device 100.

[0042] The first dimension and optionally the second dimension is preferably at least 2 mm smaller than the passage opening 211, 212, preferably at least 5 mm smaller.

[0043] Figure 4 further shows that a peripheral edge of the fastening part 121, 131 can be chamfered or rounded at the position of an upper outer end. The peripheral edge of fastening part 121, 131 preferably has a chamfering, particularly at the upper outer end. Arranging a chamfering on the peripheral edge of fastening part 121, 131 creates an oblique or sloping angle. This chamfering can provide various advantages in the context of the road plate coupling device 100. The chamfering thus reduces the chances of injury or wounding due to sharp edges. This reduces the risk of cuts or unintended contact with the sharp edges of the fastening part 121, 131. The same is true for tyres of vehicles that could become damaged by a sharp edge. The chamfering facilitates insertion of the fastening part 121, 131 into the passage opening 211, 212. Owing to the chamfered edge, the fastening part 121, 131 can slide through the opening more smoothly and easily, this making the installing and fastening procedure more efficient. The chamfering can also contribute to a reduction in friction between the fastening part 121, 131 and the edges of the passage opening 211, 212. This can reduce the resistance during insertion and result in a smoother movement of fastening part 121, 131. Chamfering the peripheral edge of fastening part 121, 131 also enables the structural integrity and durability of the component to be improved. The chamfering can reduce the stresses on the edges and avoid possible stress concentration points, this reducing the chances of damage or failure due to fatigue.

[0044] The fastening part 121, 131 preferably further comprises an aligning means which is configured to align the fastening part 121, 131 relative to the respective road plate fastening means in at least one of the inserting position and the fastening position. The aligning means has the object of ensuring that the fastening part 121, 131 is correctly aligned with the corresponding road plate fastening means during installation and fastening. This contributes to an accurate positioning and correct operation of the road plate coupling device 100. By making use of an aligning means the correct orientation and angle of the fastening part 121, 131 relative to the road plate fastening means can for instance be guaranteed. This is particularly important when the fastening part 121, 131 is rotatable, as stated above. The aligning means helps to ensure that the fastening part 121, 131 is aligned and positioned in the correct way so that it is able to rotate correctly between the inserting position and the fastening position. The use of an aligning means can also facilitate the installation procedure and improve accuracy. It helps in guiding and positioning of the fastening part 121, 131, this reducing the chances of incorrect alignment or assembly errors. The aligning means are not visible due to the perspective view and cross-sectional drawings. More preferably, the aligning means extends from a lower side in a direction of the road plate fastening means and the road plate fastening means comprises a recess which is congruent with the aligning means, so that the aligning means can be arranged in the recess. Placing the aligning means on the lower side and having it extend in the direction of the road plate fastening means makes a clear guiding and alignment between the two components pos-

sible. The recess in the road plate fastening means, which has the shape of the aligning means, functions as a fitting space in which the aligning means fits precisely. This ensures a strong and accurate connection between the fastening part 121, 131 and the road plate fastening means. The use of an aligning means and a corresponding recess provides multiple advantages. It facilitates installation of the fastening part 121, 131 and ensures that it is correctly placed and aligned with the road plate fastening means. This reduces the chances of installation errors and improves the accuracy and stability of the road plate coupling device 100. The aligning means can furthermore help to uniformly distribute the load over the fastening part 121, 131 and the road plate fastening means, this increasing the durability and reliability of the coupling device. The aligning means is more preferably smaller than a width of the passage opening 211, 212. By making the aligning means smaller than a width of the passage opening 211, 212 no unevenness will result on the upper surface of the road plate when the fastening part 121, 131 is in the fastening position. In this way the aligning means extends in the space located between the road plate fastening means and the wall of the road plate.

[0045] The distance between the two road plate fastening means is preferably greater than the shortest distance between two adjacent passage openings 211, 212 of the two road plates 201, 202, preferably at least 3 cm greater.

[0046] The skilled person will appreciate on the basis of the above description that the invention can be embodied in different ways and on the basis of different principles. The invention is not limited here to the above described embodiments. The above described embodiments and the figures are purely illustrative and serve only to increase understanding of the invention. The invention is not therefore limited to the embodiments described herein, but is defined in the claims.

Claims

1. Set of at least one road plate coupling device (100) and at least two road plates (201, 202), which road plates are provided with at least one passage opening (211, 212) extending through the road plate in a direction transversely of the road plate surface, wherein the road plate coupling device comprises a base (110) and two road plate fastening means (120, 130), wherein the two road plate fastening means are arranged on the base at a distance from each other and extend in a direction transversely of the base, wherein the two road plate fastening means (120, 130) each comprise a fastening part (121, 131) which is mounted movably on the respective road plate fastening means so that the fastening part is movable between an inserting position and a fastening position, wherein in the inserting position the fastening part and the respective road plate fastening means are insertable through the at least one passage opening so that in the inserted position the base is situated on a first side (S1) of the road plate and the fastening part is situated on a second side (S2) of the road plate, and wherein in the fastening position the fastening part is movable so that the fastening part extends at least partially over the second side of the road plate.

2. The set according to the foregoing claim, wherein the at least one passage opening (211, 212) of each road plate (201, 202) is an elongate passage opening which is longer than it is wide, wherein the elongate passage opening lies substantially parallel to an edge of a road plate.

3. The set according to the foregoing claim, wherein the fastening part (121, 131) is elongate, wherein the fastening part is longer than it is wide and preferably has a length which is greater than 50% of the width of the passage opening.

4. The set according to the foregoing claim, wherein the fastening part is mounted movably on a shaft so that the fastening part is rotatable between the inserting position and the fastening position.

5. The set according to any one of the foregoing claims, wherein the road plate coupling device further comprises a fixing means which is configured to releasably fix the fastening part relative to the respective road plate fastening means, wherein the fixing means has a fixing position and an open position, wherein in the fixing position the fixing means fixes the fastening part in one of the inserting position and the fastening position and wherein in the open position of the fixing means the fastening part is free to move between the inserting position and the fastening position.

6. The set according to any one of the foregoing claims 2-5, wherein a dimension of the fastening part is smaller than the elongate passage opening, so that the fastening part is insertable through the passage opening.

7. The set according to any one of the foregoing claims 2-6, wherein the road plate fastening means have a second dimension which is smaller than the passage opening so that in the inserted position there is a space between the road plate and the inserted road plate fastening means, wherein the space is measured between respective peripheral walls of the road plate and the inserted road plate fastening means.

8. The set according to any one of the foregoing claims 6-7, wherein the first dimension and optionally the

second dimension is at least 2 mm smaller than the passage opening, preferably at least 5 mm.

9. The set according to any one of the foregoing claims, wherein a peripheral edge of the fastening part is chamfered at the position of an upper outer end.

10. The set according to any one of the foregoing claims, wherein the fastening part further comprises an aligning means which is configured to align the fastening part relative to the respective road plate fastening means in at least one of the inserting position and the fastening position.

11. The set according to the foregoing claim, wherein the aligning means extends from a lower side in a direction of the road plate fastening means; and wherein the road plate fastening means comprises a recess which is congruent with the aligning means so that the aligning means can be arranged in the recess.

12. The set according to the foregoing claim, wherein the aligning means is smaller than a width of the passage opening.

13. The set according to any one of the foregoing claims, wherein the distance between the two road plate fastening means is greater than the shortest distance between two adjacent passage openings of the two road plates, preferably at least 3 cm greater.

14. A road plate coupling device (100) for releasably coupling two road plates (201, 202), which road plates are provided with at least one passage opening (211, 212) extending through the road plate in a direction transversely of the road plate surface, wherein the road plate coupling device comprises a base (110) and two road plate fastening means (120, 130), wherein the two road plate fastening means are arranged on the base at a distance from each other and extend in a direction transversely of the base, wherein the two road plate fastening means (120, 130) each comprise a fastening part (121, 131) which is mounted movably on the respective road plate fastening means so that the fastening part is movable between an inserting position and a fastening position, wherein in the inserting position the fastening part and the respective road plate fastening means are insertable through the at least one passage opening so that in the inserted position the base is situated on a first side (S1) of the road plate and the fastening part is situated on a second side (S2) of the road plate, and wherein in the fastening position the fastening part is movable so that the fastening part extends at least partially over the second side of the road plate.

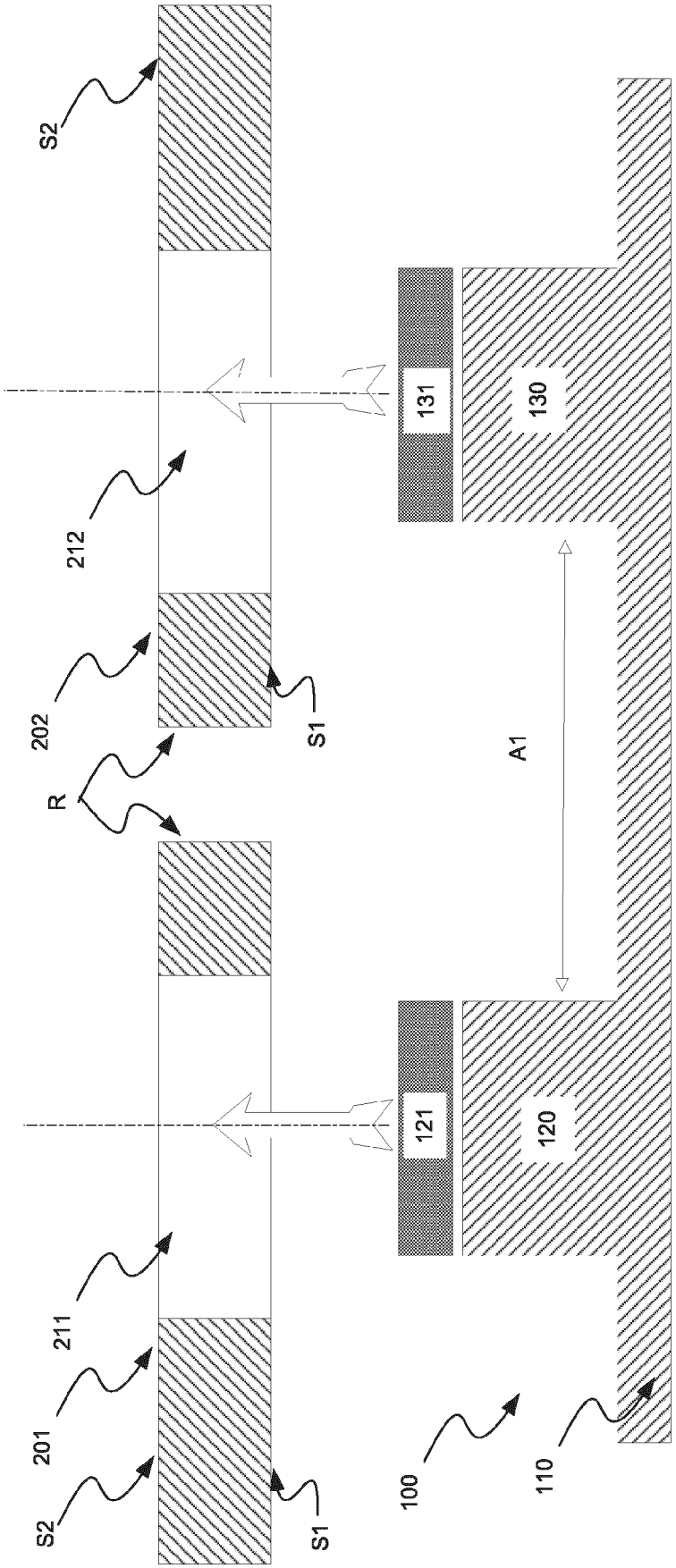

FIG. 1

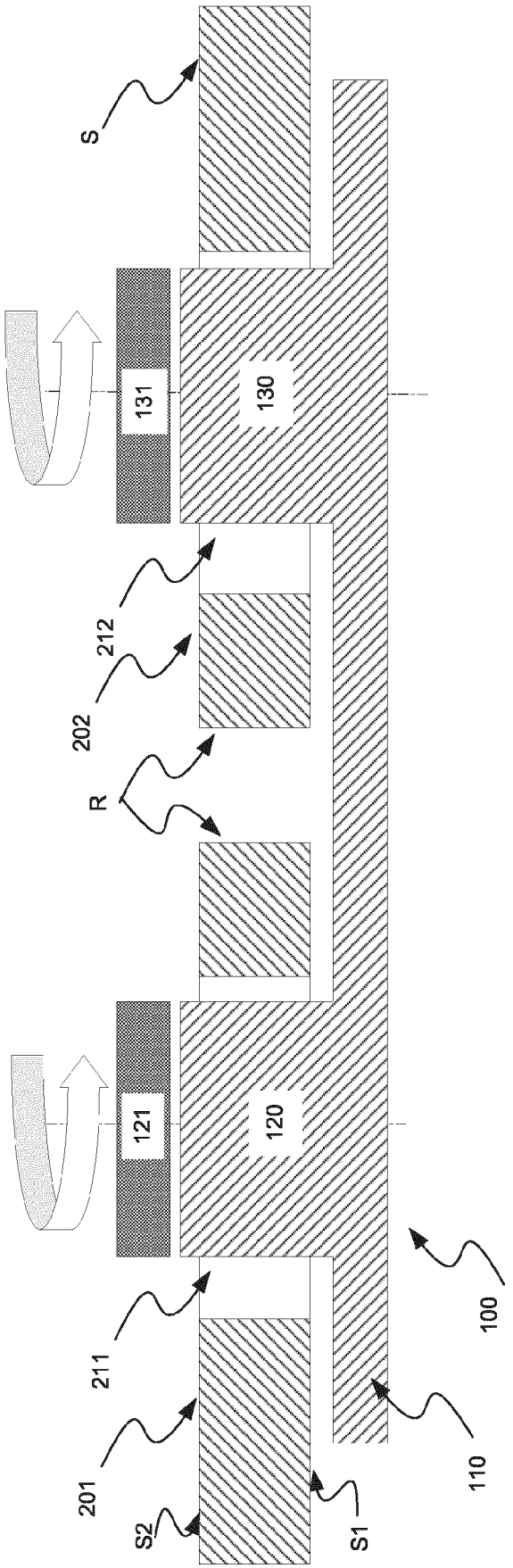

FIG. 2

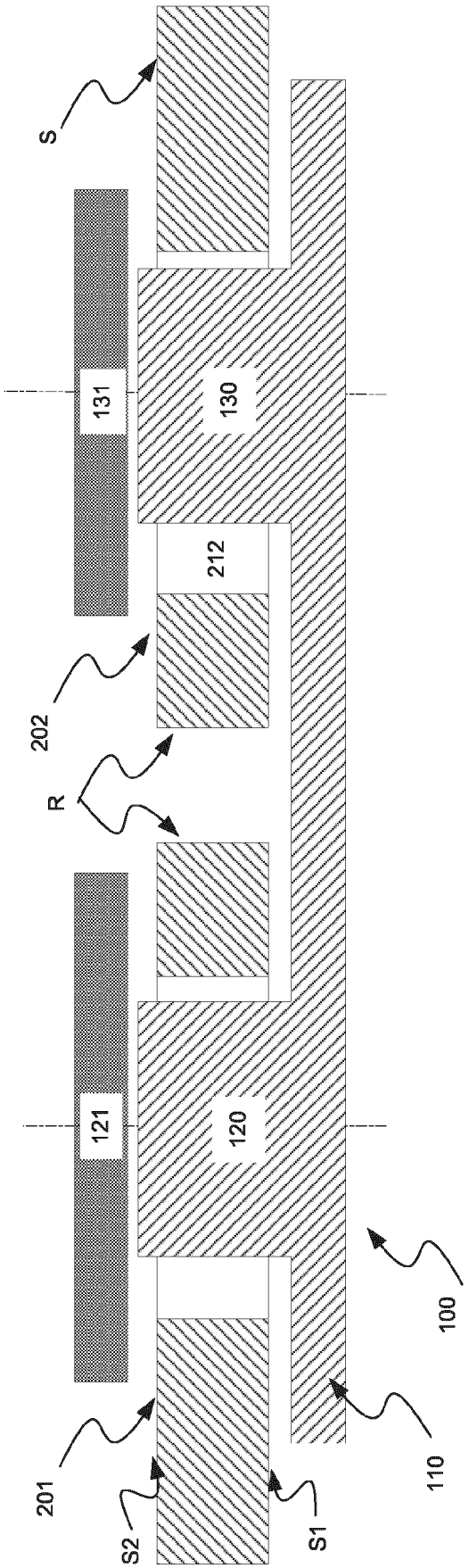

FIG. 3

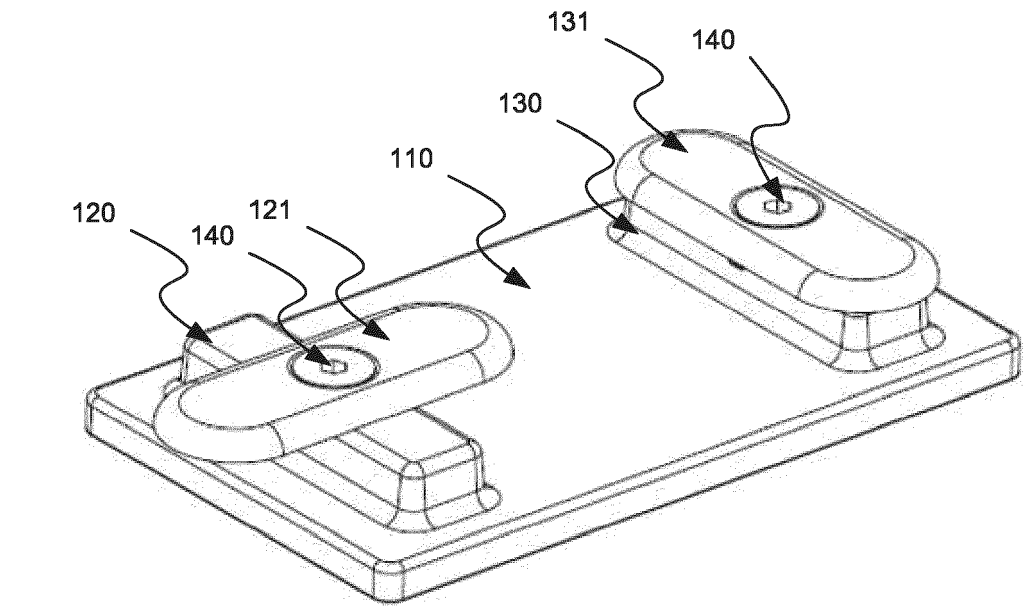

FIG. 4

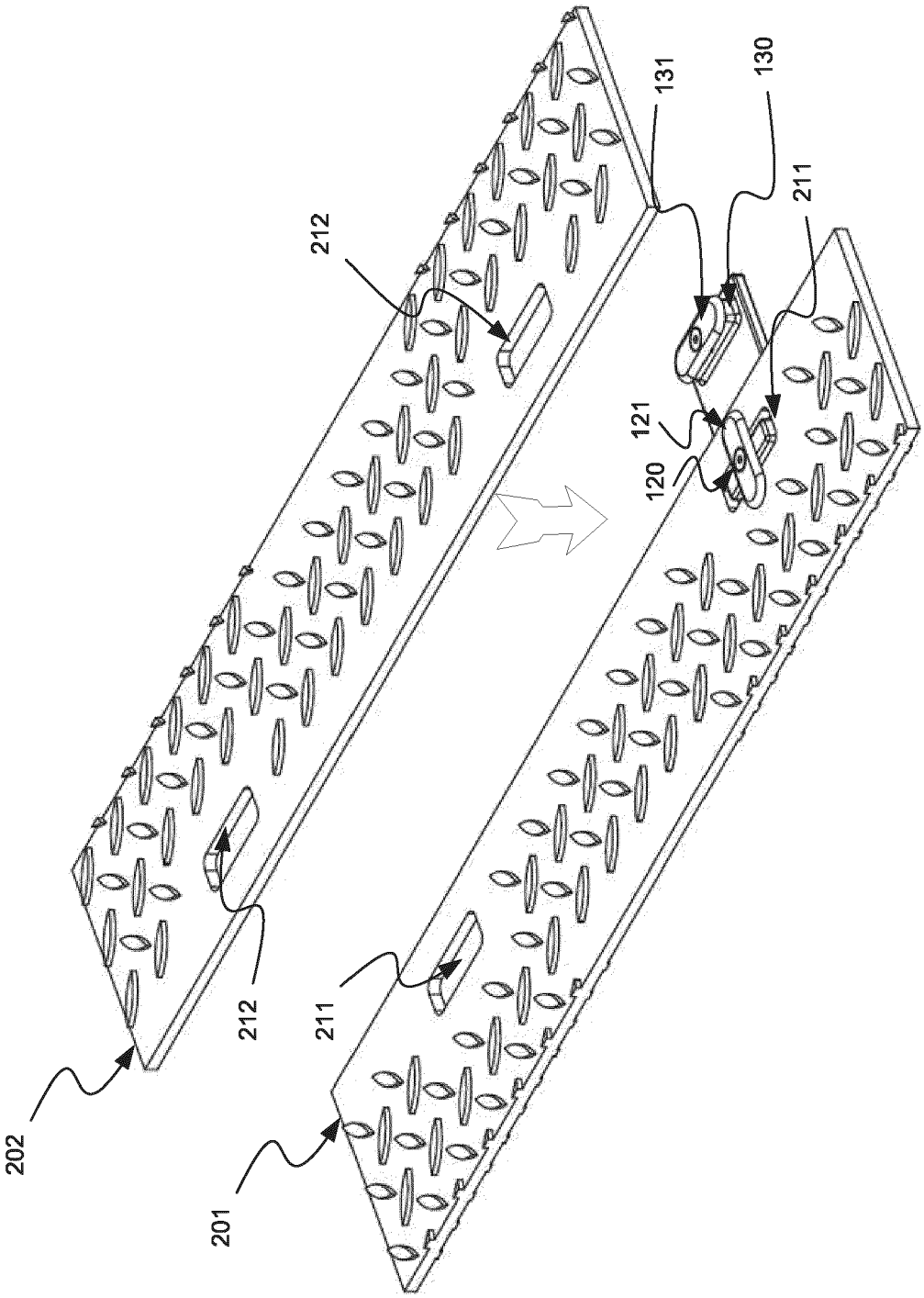

FIG. 5

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EUROPEAN SEARCH REPORT

Application Number
EP 24 18 5686

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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E01C

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	4 October 2024	Movadat, Robin

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