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(54) **Váltósínszék sinváltó számára**

Az európai szabadalom ellen, megadásának az Európai Szabadalmi Közlönyben való meghirdetésétől számított kilenc hónapon belül, felszólalást lehet benyújtani az Európai Szabadalmi Hivatalnál. (Európai Szabadalmi Egyezmény 99. cikk(1))

A fordítást a szabadalmas az 1995. évi XXXIII. törvény 84/H. §-a szerint nyújtotta be. A fordítás tartalmi helyességét a Szellemi Tulajdon Nemzeti Hivatala nem vizsgálta.

DESCRIPTION

[0001] The present invention relates to a slide chair for a rail switch, a rail switch having at least one such slide chair and a heating device for a rail switch.

[0002] Rail devices for rail vehicles are exposed to the weather to a particular extent. The proper performance of rail devices having movable parts, in particular, such as rail switches, can be limited, in particular in the event of cold and/or ice and snow. Such limitations can lead to considerable disruptions for rail traffic, including cancellation of train services. Therefore, rail switches, in particular, are generally equipped with heating devices to be able to heat them during bad weather. Owing to the complexity of the structure and the large number of different components of a rail switch, a suitable arrangement of heating components must be ensured to be able to achieve a desired heating result. WO 2009/109664 A1 discloses a railway switch having such a heating device. An object of the present invention consists in designing a slide chair of a rail switch such that compact and efficient heating of components of the rail switch is possible.

[0003] This object is achieved by a rail switch according to Claim 1. Advantageous embodiments and developments can be found in the dependent claims.

[0004] A slide chair for a rail switch is described. The slide chair comprises a base plate, by means of which the slide chair can be fixed, and a slide chair plate, which is fixedly connected to the base plate. A hot fluid duct channel is formed in the base plate. The slide chair can thus be designed such that it fulfils its normal function as a slide chair and also can act as a part of a heating device. The hot fluid duct channel is provided on the slide



chair, in particular on the base plate, for heat transfer; the heat can be transferred in particular via a thermally conductive contact. For example, it can be provided for the hot fluid duct and/or the hot fluid duct channel to be in or to be brought into thermally conductive contact with a hot fluid, for example via an inner wall, along which the hot fluid can flow. It can thus act as heating for the slide chair. Moreover, the hot fluid duct channel allows hot fluid to be conducted through the slide chair in a space-saving and protected manner. The base plate can be fixed to a suitable base device or support of the rail switch, in particular a sleeper, or to another reference point fixed to the ground. The fixing of the slide chair can in particular mean that the base plate is anchored in relation to the ground and/or to the support and/or is fastened to a suitable fixing device, for example by screw-fastenings, embedding in concrete, nails or another fastening device or anchor. A slide chair plate can be provided to fix a rail of the rail switch, in particular a stock switch, against displacement. To this end, the slide chair plate is connected fixedly to the base plate, for example by means of a suitable screw-fastening and/or weld. The base plate and/or the slide chair plate can generally be produced from a metallic material, for example from steel. It is conceivable for the base plate and/or slide chair plate and/or slide chair to be produced from a cast material. The hot fluid duct channel is designed according to the invention to receive a hot fluid and to conduct it through the base plate. The hot fluid duct is formed directly in the base plate, for example by means of one or more bores. In one variant, a pipeline can be accommodated, in particular embedded, in the base plate. The hot fluid duct channel and/or the hot fluid duct can have one or more fluid connections, via which a hot fluid can be supplied and/or discharged. Such connections can be arranged or arrangable in or at suitable openings in the base plate. In general, a rail switch in the context of the present

description can be a point switch. A rail switch can have at least one rail pair of stock rail and point rail. A slide chair can be provided to fix a stock rail on the side thereof that faces the point rail. It is conceivable for a point switch to be able to be displaced on the slide chair. In particular, it can be provided for the slide chair plate to be designed to support the point switch in a displaceable manner. The slide chair plate can be fastened directly or indirectly to the base plate, above the latter. In particular, it can be provided for the slide chair plate to be substantially unable to move relative to the base plate and/or to be fastened or fastenable in a stationary manner relative to the base plate. It is generally conceivable for the slide chair plate to be attached to the base plate in a form-fitting manner, or for the slide chair plate to be integrally joined to the base plate. The hot fluid duct channel can be cast and/or milled and/or drilled into the base plate. It is conceivable for a hot fluid duct pipe to be installed, in particular embedded, in the hot fluid duct channel. A hot fluid duct pipe can generally be produced in particular from a suitable stainless steel. A hot fluid duct, in particular a pipe or a hose, accommodated in the hot fluid duct channel can run out of the base plate via an opening in the base plate or via a plurality of openings in the base plate in order to provide a possibility for connection that is arranged or can be arranged outside the slide chair. A hot fluid duct can generally have one or more connections for connection to a hot fluid line. It is conceivable for a hot fluid duct to comprise a line, a plurality of lines or a flow field, via each of which a heating medium is conducted or can be conducted. A hot fluid duct channel can be designed to accommodate a hot fluid duct and/or to be a hot fluid duct itself. A hot fluid can generally be any fluid that is suitable as a heat-transfer medium for a heating device. For example, a hot fluid can comprise a liquid and/or a gas, such as water, an oil, a water/glycol mixture, hot

steam and/or combustion gases. In general, a hot fluid duct can be fastened or fastenable in the hot fluid duct channel and/or on the slide chair and/or on the base plate in a suitable manner, for example by screw-fastening and/or adhesive bonding and/or clamping and/or welding and/or soldering and/or casting or embedding. In general, it can be provided for the hot fluid duct channel to have channel openings, for example at least or exactly one inlet opening in the base plate and at least or exactly one outlet opening in the base plate. The channel openings can be lateral openings in the base plate. The hot fluid duct channel can be formed with a hot fluid duct and/or a hot fluid duct can be accommodated between the openings. It can be provided for the hot fluid duct channel to be in a curved or angled form instead of describing a straight line in the base plate between the outlet opening and the inlet opening. In this case, a plurality of curves and/or angles can be provided. The shape of the hot fluid duct channel can be determined taking into account a desired heat transfer and/or structural requirements of the slide chair. A heat-transferring contact can be a thermally conductive contact. It is conceivable for a thermally conductive contact to be provided or providable between two components, for example between a hot fluid duct and the base plate and/or the hot fluid duct channel, by direct contact between the components. Alternative or additionally, a thermally conductive contact can be provided or providable between two components via one or more thermal conduction elements arranged between said components. A thermal conduction element in this case can have good thermal conduction properties and comprise for example a thermally conductive paste and/or a metallic element such as a metal layer or a foil. It can be provided, for example, for a thermally conductive paste to be arranged or arrangeable at least at some points between a hot fluid duct, for example a pipe, and the base plate and/or the hot fluid duct channel. In general, it can be

expedient if components provided for thermally conductive contact themselves have good thermal conduction properties and for example consist of and/or comprise metallic materials. Different components can have different materials. In one variant, the slide chair comprises a rail-holding device. The rail-holding device can be designed to fasten a rail, in particular a stock rail, to the slide chair. The rail can be fastened or fastenable to the slide chair by means of the rail-holding device. It is conceivable for the rail-holding device to be arranged such that a rail fastened thereto is accommodated or can be accommodated between the rail-holding device and the slide chair plate. In particular, the rail can be clamped or clampable by the slide chair plate on the side thereof opposite the rail-holding device. The rail-holding device can have a screw-fastening and/or a bolt device, by means of which the rail is fastened or can be fastened.

[0005] It can be provided for the hot fluid duct channel to be designed to accommodate a hot fluid duct. Such a hot fluid duct can for example be formed by a hose and/or pipe, which can be laid into the hot fluid duct. It is conceivable for hose and/or pipe to be embedded in the base plate. It is also conceivable for the pipe and/or hose to be introduced into the hot fluid duct and fastened thereto and/or therein. For example, a hot fluid duct in the form of a pipe can be laid into the hot fluid duct channel and connected or adhesively bonded to the hot fluid duct channel by means of a thermally conductive paste. It is conceivable for a clip device and/or a bridge device to be provided to keep a hot fluid duct inside the hot fluid duct channel.

[0006] The hot fluid duct channel can be arranged on the side of the base plate opposite the slide chair plate. In particular, the hot fluid duct channel can be arranged

under the base plate. This allows a hot fluid duct to be run close to the ground.

[0007] In one development, the hot fluid duct channel can have an open profile. With such a profile, a hot fluid duct can easily be laid into the hot fluid duct channel. Furthermore, a hot fluid duct can be removed more easily via an open profile, if this is necessary for maintenance or repair purposes.

[0008] It can in particular be provided for the profile to be open towards the lower face of the base plate. The structural integrity of the slide chair plate is thus affected as little as possible and easy access to the hot fluid duct channel is permitted.

[0009] A hot fluid duct in the form of a hose or pipe for conducting a hot fluid can be accommodated or accommodatable in the hot fluid duct channel. The hot fluid duct channel can be dimensioned correspondingly to be able to receive the desired hose or pipe. The hose and/or pipe can lead or be routable out of the base plate and/or project out of the base plate in one or two directions. Thus, for example, connections can be provided on the hose or pipe and laid for connection remotely from the slide chair.

[0010] The hot fluid duct channel can run in at least one curve. For example, the hot fluid duct channel can have at least one U-shaped curve.

[0011] An accommodation region, which can accommodate a clamping device, can be provided between base plate and slide chair plate. Such a clamping device can be provided to have a positive effect on the fastening properties of the slide chair plate even under load, for example from a train driving over the slide chair. The hot fluid duct

channel is expediently arranged such that it does not affect the functioning of the clamping device.

[0012] Furthermore, a rail switch is provided with at least one slide chair described herein. The rail switch can in particular be a point switch and correspondingly have stock rails and point rails. The hot duct channels and/or hot fluid ducts accommodated in the hot fluid duct channels can be connected and connectable to each other and/or to a hot fluid source and/or to a hot fluid discharge means via suitable connections and/or connecting lines.

[0013] Furthermore, a heating device for a rail switch is provided, which is designed to conduct a hot fluid through a hot fluid duct in a hot fluid duct channel of at least one slide chair described herein. The rail switch can be a rail switch described herein. The heating device can have at least one pump for providing the hot fluid and/or at least one heat source for heating the hot fluid. A heat source can be for example a burner, an electrical heating device, a geothermal device or a similar device. The heating device can also have suitable connections such as pipes, hoses and/or corresponding lines and connection devices, via which one or more slide chairs and/or hot fluid duct channels of slide chairs and/or hot fluid ducts accommodated therein can be supplied with hot fluid, for example by means of one or more pump devices. It is conceivable for slide chairs and/or hot fluid ducts of slide chairs to be connected or connectable in series and/or in parallel in terms of flow.

[0014] Embodiments of the invention are described by way of example below with the aid of the attached drawings.

[0015] In the figures:

- Fig. 1 schematically shows a view of a slide chair plate with a hot fluid duct channel,
- Fig. 2 schematically shows a part of a rail switch with a plurality of slide chairs,
- Fig. 3 shows a side view of a slide chair of a rail switch,
- Fig. 4 shows a plan view of a slide chair,
- Fig. 5 shows a view of a slide chair from below,
- Fig. 6 shows a view of a slide chair from obliquely below,
- Fig. 7 shows a cross-sectional view of a slide chair.

[0016] Figure 1 schematically shows a plan view of a part of a slide chair 10. The slide chair 10 comprises a base plate 12 and a slide chair plate 14 arranged thereabove. The slide chair plate 14 is connected fixedly to the base plate 12 and arranged such that the slide chair plate 14 can hold a stock rail 100 of a point switch in a manner known per se. The base plate 12 is fastened or can be fastened to a rail sleeper 50 via fastening holes 16. A supporting device 21 of the slide chair 10 is provided to accommodate and protect a clamping device such as a clamping bracket. The slide chair can be regarded as part of a rail switch. A point rail 102, which is associated with the stock rail 100, of the rail switch is mounted on the slide chair plate 14 such that said point rail can be moved relative to the stock rail 100. A hot fluid duct channel 20, which is shown using dashed lines in the drawing, is provided in the base plate 12 of the slide chair 10. A hot fluid duct 22, which is in the form of a hot fluid duct pipe in this example, is accommodated in the

hot fluid duct channel 20. The hot fluid duct channel 20 has a first channel opening or inlet opening 24, in which the pipe 22 enters the base plate and the hot fluid duct channel 20. Furthermore, a second channel opening or outlet opening 26 is provided, via which the pipe 22 exits from the hot fluid duct channel 20 after it has described a substantially U-shaped curve embedded in the hot fluid duct channel 20 inside the base plate 12. The pipe 22 projects beyond the base plate 12 both at the first channel opening 24 and at the second channel opening 26. In this example, it is provided for the pipe 22 to extend even beyond the sleeper 50 to which the base plate 12 is fastened. A fluid connection 28, 30 is provided at each end of the pipe 22, via which fluid connection a hot fluid can be fed into or discharged from the pipe 22 via an associated line 32, 34 of a heating device. If a warm heating fluid flows via the lines 32, 34 and the pipe 22, the heating fluid in the hot fluid duct channel 20 can emit heat to the base plate 12 and the slide chair 10 in order to heat the latter.

[0017] Figure 2 shows a larger part of a rail switch having a plurality of slide chairs 10. The slide chairs 10 each correspond to the slide chair 10 described with reference to Figure 1. In Figure 1, it can be seen that point rail 102 and stock rail 100 are not arranged parallel to each other. A rail-holding device 25 is provided on each slide chair 10, by means of which rail-holding device the stock rail 100 is in each case screw-fastened to the slide chair 10 and held against displacement. The corresponding rail-holding device cannot be seen in the limited detail of Figure 1, although it can be present. The stock rail 100 is secured against displacement by the slide chair 10 on the side of the stock rail 100 facing the point rail 102 and opposite the rail-holding device 25 in relation to the stock rail 100. The point switch 102 is mounted on the slide chair plate 14 and can be displaced thereon. The slide chairs 10 are each connected in series in terms of

flow via connecting lines 32, 34 so that a hot fluid can flow successively through the slide chairs shown and heat them. Another arrangement in terms of flow is of course also conceivable, for instance a parallel arrangement or a single arrangement, in which one or more slide chairs 10 can each be supplied or are each supplied separately with hot fluid. It can also be provided for differently designed slide chairs to be used instead of every slide chair 10 of a rail switch having a hot fluid duct channel 20 as indicated herein or a corresponding hot fluid duct. For example, slide chairs 10 as shown in Figures 1 and 2 can be used at particularly temperature- or weather-sensitive locations of a rail switch, while different types of slide chairs without the described hot fluid duct channel 20 can be used at less sensitive locations.

[0018] Figure 3 shows a cross-sectional view of a mounted slide chair 10. The rail-holding device 25 is arranged on the base plate 12 of the slide chair 10 to hold the stock rail 100 on the side facing away from the point rail 102. The point rail 102 is arranged movably on the slide chair 10, as shown, and can in particular be displaced on the slide chair plate 14. The slide chair plate 14 is arranged such that it can clamp the stock rail 100 on the side opposite the rail-holding device 25 and in particular secure said stock rail against lateral movements. A hot fluid duct 22 in the form of a pipe with the connection 28 is laid inside the hot fluid duct channel 20. An accommodation region of the supporting device 21 is provided between the slide chair plate 14 and the base plate 12, in which accommodation region a clamping device that can be supported by the supporting device 21 can be accommodated. Furthermore, the base plate 10 can be fixed or fixable by means of a fastening hole 16 shown by way of example. It is self-evident that a plurality of fastening holes can be provided.

[0019] Figure 4 shows a view of the slide chair 10 from above. In contrast to the view of Figure 1, the rail-holding device 25 for fixing a stock rail 100 together with fastening holes 16 can be seen here.

[0020] Figure 5 shows a view of a slide chair 10 from below. It can be seen that the hot fluid duct channel 20 is formed in the base plate 12 and extends in a substantially U-shaped manner between the channel openings 24, 26. A substantially oval opening 32 is also formed in the base plate 12, through which opening a clamping device can be seen. Such a clamping device can be arranged in the supporting device 21 between base plate 12 and slide chair plate 14 (not shown here). The opening 32 is used to receive the clamping device and can allow access to the clamping device. Furthermore, the base plate 12 can be structurally relieved of loading in the region of the clamping device by means of the opening 32.

[0021] Figure 6 schematically shows a view of a slide chair 10 from obliquely below. In this view, the slide chair plate 14 and the rail-holding device 25 and the fastening openings 16 are indicated. The hot fluid duct channel 20 runs around the oval base plate opening 32 in a substantially U-shaped manner between the channel openings 24, 26. It can be seen that the hot fluid duct channel 20 has a profile that is open at the bottom, so that a hot fluid duct pipe or a hot duct hose can easily be introduced into the hot fluid duct channel 20.

[0022] Figure 7 shows a cross-sectional view of a slide chair 10 from behind. A supporting device opening 36 can be seen, which allows access to the accommodation region between slide chair plate 14 and base plate 12. As can be seen generally from the drawings, the hot fluid duct channel 20 runs inside the base plate 12 in such a manner that said channel does not affect the structural integrity

of the base plate 12 and the fastening of the slide chair 10 to a sleeper or support.

List of reference symbols

[0023]

10	Slide chair
12	Base plate
14	Slide chair plate
16	Fastening holes
20	Hot fluid duct channel
21	Supporting device
22	Pipe
24	Inlet opening
26	Outlet opening
25	Rail-holding device
28	Connection
30	Connection
32	Opening
36	Supporting device opening
50	Sleeper
100	Stock rail
102	Point rail

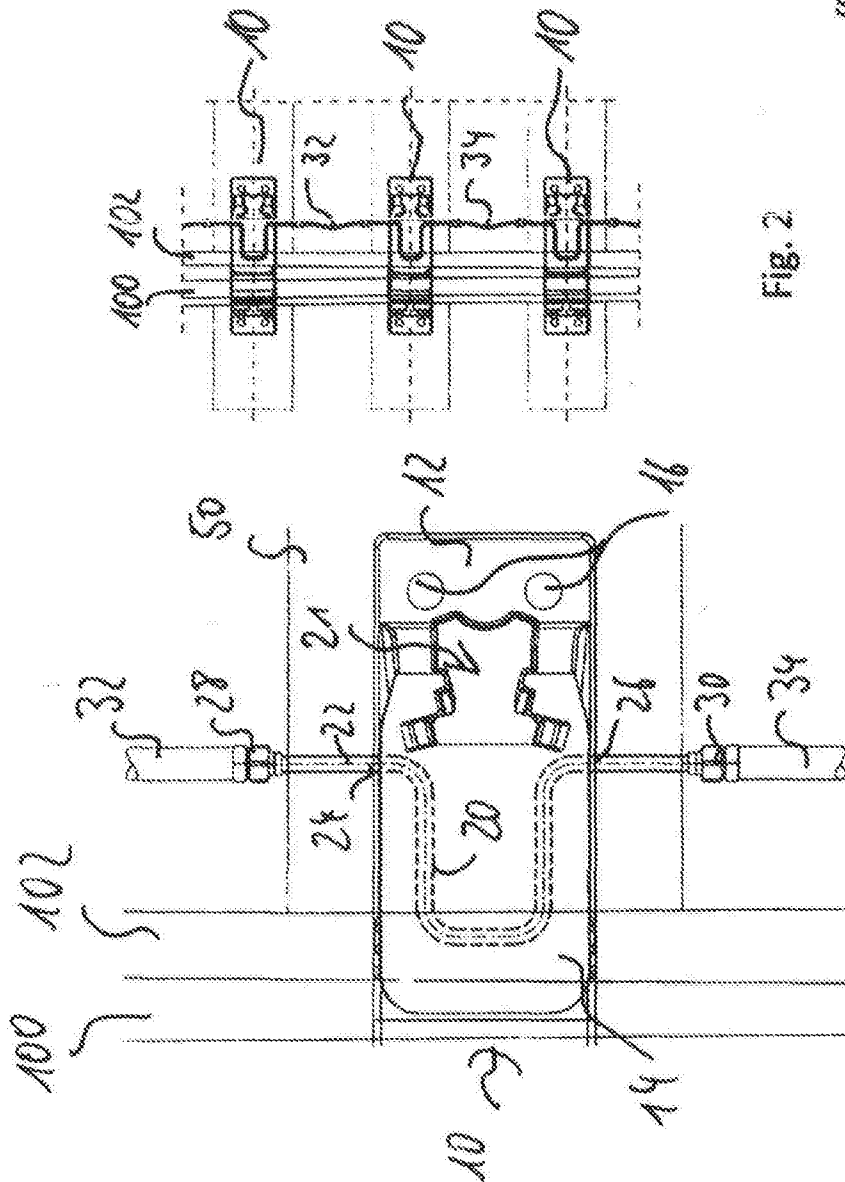
Szabadalmi igénypontok

1. Váltósínszék (10) sínváltó számára, amely tartalmaz
alaplemezt (12), aminek révén a váltósínszék (10) rögzítve van vagy rögzíthető;
váltósínszék lemezt (14), amely az alaplemezzel (12) szilárdan össze van kötve; azzal
5 jellemezve, hogy az alaplemezben (12) fűtőfluidvezető csatorna (20) van kialakítva.
2. Az 1. igénypont szerinti váltósínszék, ahol a fűtőfluidvezető csatorna (20) arra van
kialakítva, hogy fűtőfluidvezeték (22) fogadjon be.
3. Az előző igénypontok bármelyike szerinti váltósínszék, ahol a fűtőfluidvezető csatorna
(20) az alaplemeznek (12) a váltósínszékkel (14) szembenfekvő oldalán van elhelyezve.
- 10 4. Az előző igénypontok bármelyike szerinti váltósínszék, ahol a fűtőfluidvezető csatorna
(20) nyitott profilú.
5. A 4. igénypont szerinti váltósínszék, ahol a profil az alaplemez (12) alsó oldala felé
nyitott.
6. Az előző igénypontok bármelyike szerinti váltósínszék, ahol a fűtőfluidvezető
15 csatornában (20) fűtőfluidvezeték (22) tömlő vagy cső fűtőfluid vezetésére van
felvéve vagy felvehető.
7. Az előző igénypontok bármelyike szerinti váltósínszék, ahol a fűtőfluidvezető csatorna
(20) legalább egy ívben van vezetve.
8. Az előző igénypontok bármelyike szerinti váltósínszék, ahol az alaplemez (12) és
20 váltósínszék lemez (14) között felvevőterület van betervezve, amely képes
feszítőberendezés elhelyezésére.
9. Sínváltó legalább egy váltósínszékkel (10) az 1-8. igénypontok bármelyike szerint.
10. Fűtőberendezés sínváltó számára, amely arra van kialakítva, hogy fűtőfluidot vezessen
fűtőfluidvezetéken (22) át az 1-8. igénypontok bármelyike szerinti legalább egy
25 váltósínszék (10) fűtőfluidvezető csatornájában (20).

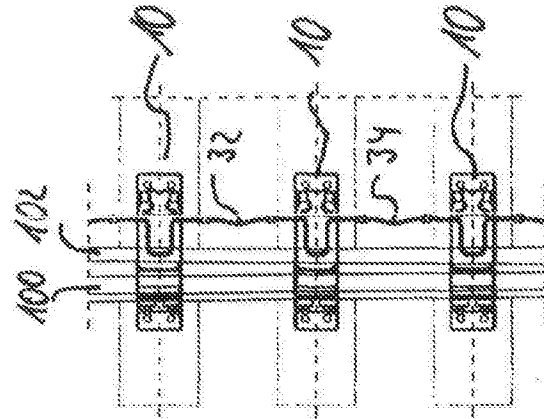




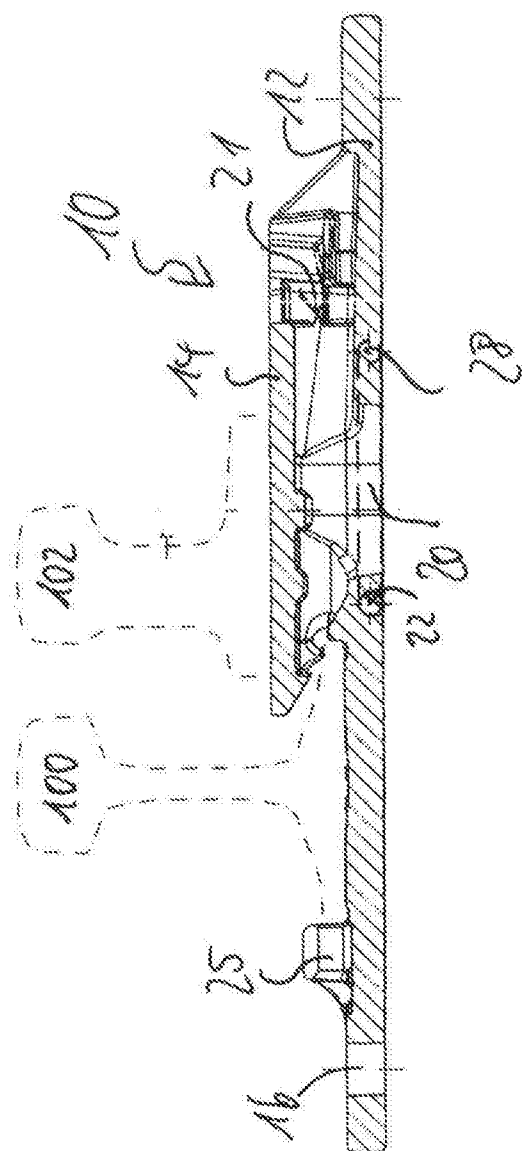
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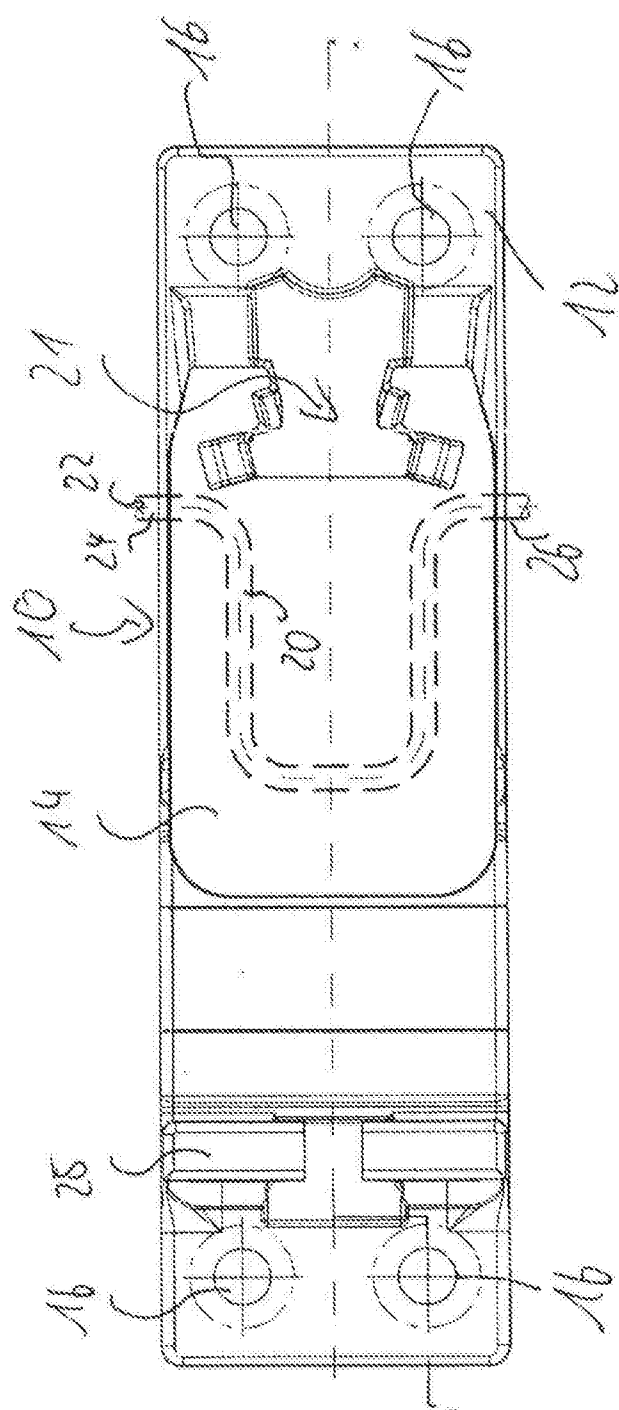


Fig. 4

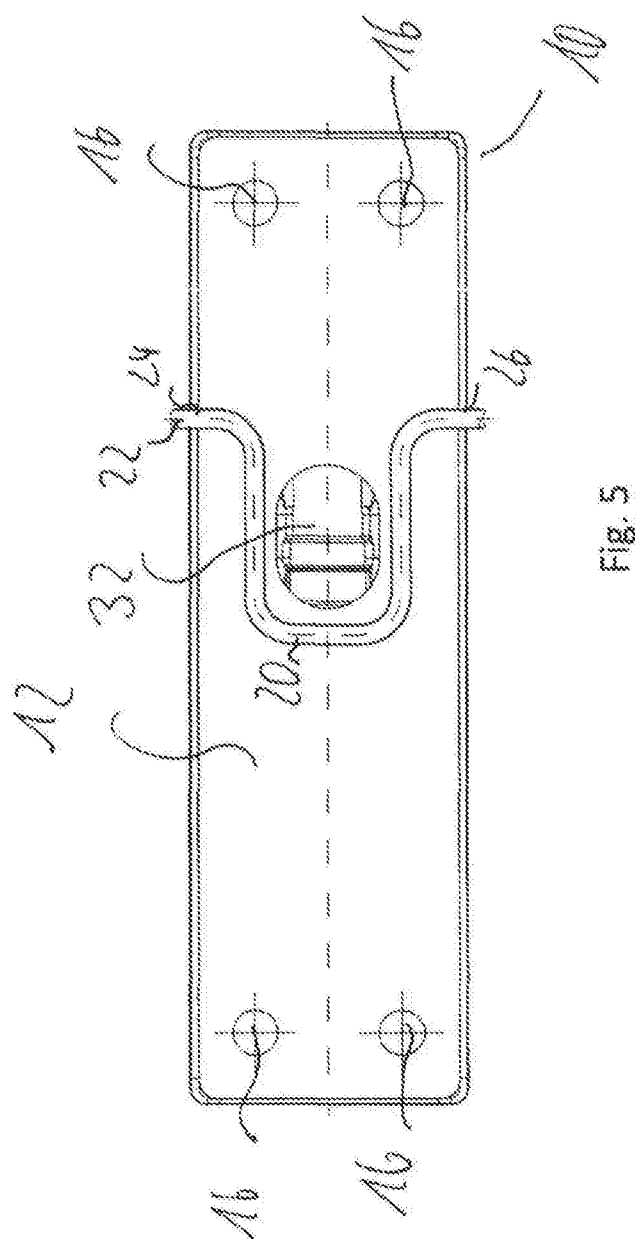


Fig. 5

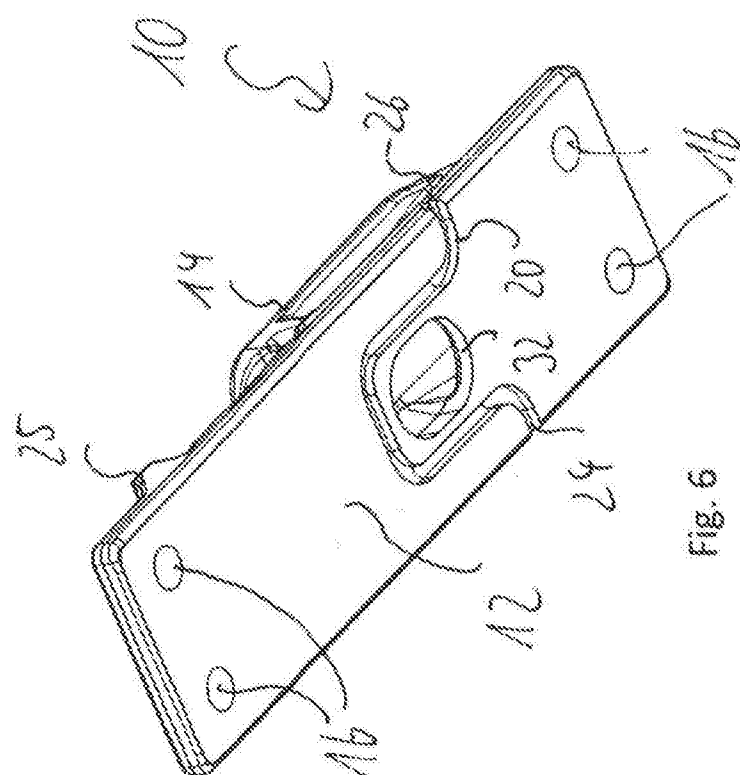


Fig. 6

