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Description

[0001] The invention relates to a cable conduit system comprising cable conduit elements, which can be joined to one another in their longitudinal direction by means of the at least one coupling element, wherein the cable conduit elements consist of an approximately U-shaped conduit under-part as well as, in particular, a cover which can be arranged on the under-part, wherein the coupling element is inserted in a detachable and/or displaceable manner into the free end regions of the cable conduit elements, wherein the coupling element, which is guided in the end regions of a cable conduit element on at least one of the side walls, comprises at least two spring systems.

[0002] These types of cable conduit systems are generally known in the respective industry and have proven themselves for years. The cable conduit systems are, depending on the operating conditions, deliverable as plastic parts, produced in the extrusion and/or coextrusion method, as aluminum-extruded parts, or also as folded metal sheet profiles.

[0003] The cable conduit elements are delivered in fixed, defined lengths so that when longer cable conduit systems are laid and/or installed, a plurality of individual cable conduit elements must be connected at their face sides so that the region where the individual cable conduit elements are joined may represent a problem because a setoff and/or a gap between the individual cable conduit elements should be avoided as much as possible during the installation of the face sides.

[0004] A number of solutions are known from prior art for the performance of such an installation of the face sides of individual cable conduit elements.

[0005] DE 295 10 836 U1 proposes, for example, the use of metal elbows to reinforce cable conduit elements laid at an angle, wherein the reinforcements are inserted into recesses provided in the mitered ends of the cable conduit elements.

[0006] EP 0 721 243 A proposes another possibility for connecting two cable conduit elements that must be joined at their face sides. The cable conduit elements with a U-shaped under-part that has a bottom and that is open on one side, with two side walls, two narrow cover strips, which run parallel to the bottom and an approximately L-shaped cross-section, with two longitudinal strips fastened to the inside of the bottom and with two coupling elements that serve to join two cable sections, are configured such that the coupling element consists of a rear plate, a base strip approximately angled at a right angle, a top strip angled at a blunt angle and two front strips approximately angled at a right angle that are formed approximately in the center of the rear plate by a three-sided free punch, which has a lug on its side. What is considered a disadvantage about this connection possibility is that, during the face-side installation of individual cable duct elements, the coupling, which is already arranged on a cable conduit, is pushed back into the conduit by the

second cable conduit element to be installed, rendering this additional cable conduit channel impossible to install.

[0007] A further disadvantage is seen in the fact that the coupling elements described can only be used for a defined geometry of cable conduit elements, which increases the production and storage costs of this solution.

[0008] It is also considered disadvantageous that these coupling elements can always only be used at a side wall of the cable conduit element, which increases the storage costs and can lead to installation mistakes.

[0009] DE 20 2008 014 724 U1 discloses a coupling element for connecting two cable conduit sections. The coupling element consists of a side element, a top strip formed on a side element, which cooperates with cover closure profiles of a conduit under-side, a resilient tongue formed on the side element and an arm hinged on the side element, which can be folded in and out. The coupling element is described as one piece. Since the purpose of the coupling element is to ensure a sufficient potential equalization between the cable conduit sections in the case of metal conduits, the coupling element is formed at least in part from electrically conductive material.

[0010] In DE202004005987U, a coupling element for a cable conduit system according to the preamble of claim 1 that is made from plastic is described; in a second embodiment made from metal, the coupling element is also able to ensure the potential equalization between two cable conduit channels to be connected.

[0011] NL 2 004 158 C describes a further integrally formed coupling element for cable conduits.

[0012] DE 298 17 946 U1 discloses an electric installation conduit from axially joined conduit profiles made from electrically conductive material, wherein adjacent conduit profiles are connected with each other for a potential equalization via connecting parts. The connecting parts are made from sheet metal and are clamped with their side edges in the conduit cross-section and provided at the side facing the conduit opening with at least one tooth bent away from the side edges, wherein the tooth engages in a wall of a projection of the conduit profile adjacent to the clamping region of the side edges. The metal connection parts are shown as integral components in the figures.

[0013] DE 84 10 740 U1 discloses a protective conductor bridge for tub-shaped device conduits made from steel sheets or another conductive material. The side walls of the protective conductor bridge are flanged at the outer edges, wherein the protective conductor bridge consisting of steel spring metal or another conductive, accordingly spring-elastic material is formed at one end as an approximately right-angled, flanged spring leaf.

[0014] In DE 20 2007 009 424 U1, a grounding clip for the potential equalization of cable routing conduits is disclosed. The grounding clip or also grounding coupling for cable routing conduits is

made from metal and comprises a cover element, a side element arranged toward the outer wall of the conduit, a side profile arranged toward the middle of the conduit, and contact tips for establishing an electrical contact with the conduit under-part, wherein at least one tongue is formed on the side element by a three-sided free punch, wherein a U-shaped holding profile is formed on the side profile and wherein the contact tips are formed on the side profile such that these cause an electrical potential equalization with the conduit under-part when the grounding coupling is inserted.

[0015] DE 297 11 068 U1 describes a further cable conduit system in which the coupling element, which is insertable in the cable conduit elements, is disclosed, in particular, for the potential equalization on cable conduit elements made from metal. A transfer element made from spring steel sheet is inserted both into the cable conduit and its cover and each is connected to a potential equalization line, wherein the transfer element conductively connects on the one hand two partial conduits that are axially positioned to one another and on the other hand their covers that are axially positioned to one another, wherein the transfer element is a punched, elongated component made of metal, which has contact tips at its longitudinal edges, which slightly protrude from the clear inner dimensions of the cable conduit under-part and wherein the transfer element is bent open in the upward direction at least at one of its free transverse edges in the form of at least one contact tip so as to electrically contact the cover part.

[0016] These types of coupling elements, in particular for the potential equalization in cable conduit elements made from metal, have proven themselves, but are not suitable, especially for their use for a face-side installation.

[0017] This is where the invention applies, which has the objective to provide a cable conduit system that overcomes the disadvantages of prior art, which can be produced in a cost-effective and economic manner, in which individual cable conduit elements can be mounted quickly, securely as well as cost-effectively and that offers, in addition to an approved mountability, a potential equalization possibility as well.

[0018] According to the invention, this object is achieved by the features of claim 1. Further advantageous embodiments are described in the subclaims.

[0019] It was surprisingly found that a cable conduit system comprising cable conduit elements, which, by means of at least one coupling element, can be joined to one another in their longitudinal direction, wherein the cable conduit elements consist of an approximately U-shaped conduit under-part as well as, in particular, a cover which can be arranged thereon, wherein the coupling element can be inserted in a detachable and/or displaceable manner into the free end regions of the cable conduit elements, wherein the coupling element, which is guided in the end regions of a cable conduit element on at least one of the side walls, comprises at least two spring systems, is

characterized in that the coupling element is arranged, via at least one element which is made at least partially of an electrically conductive material, such that it is spaced at a distance from the side wall of the cable conduit element and is in working connection with said element. Due to this advantageous configuration of the cable conduit channel according to the invention, a face-side installation of individual cable conduit elements is possible at any time so that the time- and cost-intensive reworking of coupling elements on cable conduit elements and the like is not necessary.

[0020] The cable conduit system according to the invention is further configured such that when it is delivered, the coupling element is already inserted on the free end regions of the cable conduit elements so that an appropriate installation at the construction site is possible at any time and so that the coupling elements are securely arranged during the transport and installation and make a face-side installation possible without any problems and without causing any offset or gaps.

[0021] The cable conduit system according to the invention is preferably formed such that the element is connected to the coupling element by adhesive bonding. This ensures that the face-side installation of cable conduit elements becomes easy and cost-effective, wherein the face-side mounted cable conduit elements are in an electrically working connection via the element fixed on the coupling element.

[0022] A further advantage of the cable conduit system according to the invention is that the element is connected to the coupling element by non-positive fit and/or positive fit. In this advantageous embodiment, the already described advantages of the cable conduit system according to the invention can be realized on the one hand, and, on the other hand, it is possible to recycle the element, which is made of metal, for example, and the coupling element, which is made of a polymer material, in accordance with their materials when the cable conduit system according to the invention is disposed of.

[0023] The element has an opening. Due to the arrangement and the dimensioning of this opening, the element can very quickly and easily be positioned and, if applicable, fastened to the coupling element.

[0024] The element itself comprises at least one contact means. This contact means, which is for example resiliently arranged on the element itself, may be positioned such that it applies electrical contact to the two cable conduit elements to be connected at their face sides and thus brings them into an electrical working connection.

[0025] In this context, at least one contact element configured as triangular in cross-section is arranged at the free end of the contact means. This embodiment of the cable conduit system according to the invention makes it possible, for example in the case of cable conduit elements to be mounted on the face side, which are made from metal and have a coating in the form of paint or

film, for the contact elements of the coupling element arranged on the means to establish an electrical working connection between cable conduit elements to be mounted at their face sides.

[0026] A further advantage of the cable conduit channel according to the invention is that the contact element is connected to the element itself by means of a connection means.

[0027] On the one hand, this makes it possible to significantly reduce the production of the element to be arranged on the coupling element, and on the other hand, this makes it possible to adapt the force of the contact means consisting of the connection means and the contact element to the requirements of different cable conduit elements so that when the coupling element is inserted into the cable conduit elements, a simple installation as well as a potential equalization are possible without any problems.

[0028] The cable conduit system according to the invention is preferably configured such that two contact means are arranged opposite one another at the opening of the element. Thus, the means can be produced cost-effectively, for example from a metallic material in the form of a prismatic sheet by using generally known punching and forming processes.

[0029] It was furthermore found to be advantageous that the contact means moves away from the surface of the element at an approximately acute angle and may, in this respect, be arranged both parallel as well as orthogonal to the spring system of the coupling element.

[0030] A further advantage of the cable conduit system according to the invention is that the spring systems are arranged approximately parallel over an opening spaced at a distance from one another, wherein a first spring element is connected to a second spring element at an acute angle by at least one web. With this advantageous embodiment, the coupling element can easily and quickly be fastened to the side walls of the cable conduit elements and can easily slide from the delivered state, in which the coupling element does not protrude over the face side of the cable conduit elements, to the installed state, in which the coupling element protrudes from the face sides of the cable conduit elements, securely position and safely realize the electric working connection between the cable conduit elements.

[0031] It has furthermore been found advantageous that the coupling element comprises at least one engagement element projecting away from its surface, by means of which the element can be connected to the coupling element by non-positive means. By means of this engagement element, it is very easily possible that the element, which comprises accordingly positioned openings, is placed on the coupling element and connected with the same by means of these engagement elements.

[0032] A further advantage of the cable conduit system according to the invention is that the coupling element comprises at least one positioning element that projects away from its surface. This positioning element may preferably be configured such that it bridges the gap between the

surface of the coupling element and the side wall of the cable conduit element and thus stabilizes the coupling element because this positioning element has approximately the same height as the web of the spring systems.

[0033] It is, however, also within the scope of the invention that the positioning element has a smaller height, for example the height of the first guide elements arranged on the coupling element.

[0034] The positioning element has, however, a further advantage. It serves to ensure that the element can be placed on this positioning element over precisely positioned openings and that subsequently the positioning element itself can be used to fasten the element as it is pressed, deformed or altered in another manner.

[0035] A further advantageous embodiment of the cable conduit system according to the invention is that the coupling element is made from an electrically non-conductive material. This ensures that the positioning during the face-sided installation of the cable conduit elements is easy to realize and that the potential equalization can be realized by means of the element made from an electrically conductive material. The coupling element may, in this case, be made from a polymer material. Polymer material refers to materials such as polyvinyl chloride (PVC); polyolefin, such as polypropylene (PP) or polyethylene (PE); styrol-based polymer, such as polystyrol (PS) or styrol butadiene copolymer or with a predominant styrol component (SB) or acryl nitrile styrol acryl ester copolymers (ASA) or acryl nitrile butadiene styrol copolymers (ABS) or styrol acryl nitrile (SAN); polybutylene terephthalate (PBT); polyethylene terephthalate (PET); polyoxymethylene (POM); polyamide (PA); polymethylmethacrylate (PMMA); polyphenylene oxide (PPO); polyetheretherketone (PEEK); polyphenylene sulfide (PPS); liquid crystal polymer (LCP); polyamide imide (PAI); polyvinylidene fluoride (PVDF); polyphenylsulfone (PPSU); polyaryletherketone (PAEK); polyacrylonitrile (PAN); polychlorotrifluoroethylene (PCTFE); polyetherketone (PEK); polyimide (PI); polyisobutylene (PIB); polyphthalamide (PPA); polypyrrole (PPY); polytetrafluorethylene (PTFE); polyurethane (PUR); polyvinyl alcohol (PVA); polyvinyl acetate (PVAC); polyvinylidene chloride (PVDC); as well as mixtures of at least two of these materials. Suitable fillers and/or reinforcing agents, which have a positive influence on the mechanical properties, especially glass fiber, glass balls, but also fillers such as chalk, Teflon and the like, may be mixed with the polymer material of the coupling element.

[0036] A further advantage of this embodiment is that, due to the positioning of the element in the gap between the coupling element and the side wall of the cable conduit element, said element is, when mounted, no longer visible and/or no longer touchable. This ensures that electrical conductors and/or components laid in the cable conduit element cannot come in contact with the electrically conductive element. Since the coupling means arranged on the element are located only in the gap between the coupling element and the side wall of the cable conduit element, it is considered a

further advantage of this embodiment that the wires, cables and the like laid in the cable conduit element cannot be damaged by the sharp-edged contact means.

[0037] It is furthermore advantageous that the coupling element comprises at least one first guide element arranged approximately parallel to the spring systems. This first guide element facilitates the positioning of the coupling element to be fastened on the side wall of the cable conduit element, especially due to a slight insertion slope, so that the coupling element can be quickly and easily arranged and/or displaced on the side walls of the cable conduit elements.

[0038] A further also advantageous embodiment of the cable conduit system according to the invention is that the coupling element comprises at least one second guide element, which is arranged so that it protrudes from its surface approximately orthogonally to the first guide element. It preferably serves on the one hand to increase the stability of the coupling elements, and on the other hand this second guide element improves the ease of use when the coupling elements are inserted or removed on the side walls of the cable conduit elements.

[0039] A further advantage of this embodiment is that the first guide element and the second guide element form a receiving space into which the element can be inserted and/or on which it can be fastened on the coupling element.

[0040] Furthermore, the element of the coupling element is formed such that is comprises at least one recess. This recess serves on the one hand to stabilize and/or reinforce the element itself across the geometry as well as the extension of this recess and on the other hand to render the element able to be inserted in equivalent recesses during the installation on or in the coupling element so that it is not movably arranged. Thus, when the coupling element on the side walls of the cable conduit elements is used as intended, it is ensured that, during the installation or removal, the element is arranged and remains arranged on the coupling element in a non-positive or positive fit.

[0041] This further advantageously causes the coupling element with the element arranged thereon to be optimally suited for the connection as well as for the potential equalization of cable conduit elements made of metallic materials on the one hand and on the other hand, also by removing the element, for the connection and/or installation of cable conduit elements made, for example, of polymer materials.

[0042] The cable conduit system according to the invention is furthermore formed so that the coupling element, when installed, rests on the face side of the side wall of the cable conduit element by means of at least one web of the spring system. This ensures in the cable conduit system according to the invention that the coupling element is arrested in a non-displaceable manner, positioned for the face-side installation of a further cable conduit element and that, by means of the contact means of the element on the side wall that are in an electrical working connection, potential equalization is later possible as well.

[0043] The cable conduit system according to the invention is furthermore configured in such a way that, in the installed state, the surface of the spring system is in contact essentially flush on the outer side of the side wall of the cable conduit element. This makes it possible, in the cable conduit system according to the invention, in particular when it is installed below ceilings and/or above floors, where both the side wall and the bottom wall of the cable conduit system make contact on both sides, for a further cable conduit element to be easily installed and to safely lead to the potential equalization via the element.

[0044] The invention will now be described in further detail on the basis of exemplary embodiments, which are not intended to have a limiting effect.

[0045] The figures show the following:

Fig. 1: shows a perspective representation of a detail of a cable conduit system according to the invention,

Fig. 2: shows a perspective representation of a coupling element of the cable conduit system according to the invention,

Fig. 3: shows a perspective representation of a coupling element as well as a means of the cable conduit system according to the invention.

[0046] Fig. 1 shows a perspective representation of a detail of the cable conduit system according to the invention. The cable conduit system comprises a cable conduit element 1, which can be joined to a further cable conduit element 1, not shown here, in its longitudinal direction by means of at least one coupling element 3, wherein the cable conduit elements 1 consist of an approximately U-shaped conduit under-part as well as, in particular, a cover which can be arranged thereon and not shown here, wherein the coupling element 3 is inserted in a detachable and/or displaceable manner into the free end regions of the cable conduit elements 1, wherein the coupling element 3, which is guided in the end regions of a cable conduit elements 1 on at least one of the side walls 2, comprises at least two spring systems 4, 5, wherein the coupling element 3 is arranged over at least one element 10, which is made at least partially of an electrically conductive material, is spaced at a distance from the side wall 2 of the cable conduit element 1 and is in a work connection with the same.

[0047] In Fig. 1, the means 10 is at least partially visible, wherein the means 10 comprises an opening 12 at its one free end on which two contact means 14 are arranged opposite one another at a distance from each other.

[0048] The contact means 14 are arranged at an approximately acute angle so that they project away from the surface of the means 10 as well as of the coupling element 3. The contact means 14 therefore lead in a part of the cable conduit system 1 on the side wall 2 that is not visible here to an electrically conductive working connection because the means 10 is made from a metallic material. The cable conduit element 1 is, in this embodiment, also made from a metallic material and finished with a generally known coating such as, for example, paint, Eloxal and the like.

[0049] The spring system 4 shown comprises a first spring element 41, which is connected to a second spring element 42, which is not shown here, by at least one web 43 at an approximately acute angle.

[0050] The cable conduit element 1 comprises at its side wall 2 the guide rails 21, 22, 24 as well as on the bottom wall 20 the guide rail 23. The guide rails 21, 22, 23, 24 of the cable conduit element 1 ensure that the coupling element 3 can be inserted in the same and can thus be arranged on the side wall 2 of the cable conduit system 1 so that they can be displaced in the longitudinal direction.

[0051] The coupling element 3 of the cable conduit system according to the invention is formed in this case so that it can be inserted and/or displaced both in the guide rails 21, 22 of the side wall 2 and in the guide rails 24 of the side wall 2 as well as the bottom wall 20.

[0052] Fig. 2 provides a perspective representation of the coupling element 3 of the cable conduit system according to the invention. The coupling element 3 comprises in this embodiment two spring systems 4, 5, which are arranged approximately parallel over the opening 6 spaced at a distance from one another. In this case, a first spring element 41, 51 is arranged so that it is connected to a second spring element 42, 52 at approximately an acute angle by at least one web 43, 53. In this embodiment, the first spring element 41, 51 is integrally connected to the second spring element 42, 52 by the web 43, 53.

[0053] The web 43, 53 is approximately orthogonally arranged to the second spring element 42, 52. The web 43 of the first spring system 4 is arranged at a distance from the web 53 of the second guide system 5. The coupling element 3 further comprises at least one first guide system 31 arranged approximately parallel to the spring systems 4, 5. This first guide system 31 of the coupling element 3 ensures that the coupling element 3 can be arranged easily displaceable in the guide rails 21, 22, 23, 24 of the cable conduit element 1.

[0054] Furthermore, the coupling element 3 comprises at least one second guide element 32, which is arranged approximately orthogonally to the first guide element 31, projecting away from its surface.

[0055] The second guide element 32 results, on the one hand, in a mechanical stabilization of the coupling element 3 and further serves to make the coupling element 3 displaceable through the actuation of the second guide element 32 on the side wall 2 of the cable conduit element 1. The

second guide element 32 has, in this exemplary embodiment, a lower height than the first guide element 31, wherein the first guide element 31 and the second guide element 32 in this embodiment are integrally connected with each other on the surface of the coupling element 3.

[0056] The coupling element 3 comprises an element 10, which is made from an electrically conductive material, wherein the means 10 is positioned in a receiving space formed by the first guide element 31 and by the second guide element 32.

[0057] The surface of the means 10 is rectangular in shape and comprises an opening 12 at each of its free ends. The opening 12 is also formed prismatically, wherein contact means 14 are arranged opposite one another at the opening 12 of the means 10.

[0058] In this embodiment, the contact means 14 are formed such that they have an approximately triangular contact element 13, which is connected to the means 10 via a connection means 11. The connection means 11 is arranged at an acute angle from the surface of the means 10, while the contact element 13 is arranged at an approximately right angle to the surface of the means 10. Due to this geometry of the contact means 14, it is ensured on the one hand that the coupling element 3 is positioned and fastened to the face sides of the side wall 2 of the cable conduit element 1, while, at the same time, due to the material of the means 10, the electrical working connection to the side wall 2 of the cable conduit element 1 can be established.

[0059] The means 10 in this embodiment is further configured such that is comprises an opening 15, which is configured so that it fully surrounds the spring system 4, 5.

[0060] The coupling element 3 further comprises two approximately centrally arranged positioning elements 7, which are formed approximately circular in the cross-section and which can be inserted into the openings of the means 10, not shown here. In this way, an easy and fast assembly of the means 10 on the coupling element 3 is possible without any problems.

[0061] In this embodiment, the means 10 is arranged on the coupling element 3 with a generally known adhesive bonding method.

[0062] It is also, however, within the scope of the invention that the means 10 can be arranged in a non-positive and/or positive fit by means of the engagement elements 8 arranged on the coupling element 3 such that they project away.

[0063] Further, the means 10 of the coupling element 3 is formed such that is comprises two recesses 16. The recess 16 causes the means 10 itself to be stabilized and/or reinforced by the geometry/elongation of this recess 16.

[0064] It is furthermore advantageous that the means 10, when installed on or in the coupling element 3, can be inserted into equivalent recesses 30 provided there and can thus be arranged so that it is not displaceable. Consequently, when the coupling element 3 is used as intended on the

side wall 2 of the cable conduit elements 1, it is ensured that, during installation and removal, the means 10 is and remains arranged on the coupling element 3 in a non-positive and/or positive fit.

[0065] In a further advantageous manner, this makes the coupling element 3 with the means 10 arranged thereon very suitable for the connection as well as the potential equalization of cable conduit elements 1 made from metallic materials and, by removing the means 10, for the connection and/or installation of cable conduit elements 1 made from polymer materials.

[0066] In a further advantageous embodiment of the invention, the positioning elements 7 are modified by a deformation such that the means 10 is arranged on the coupling element 3 in a positive fit. In this embodiment, the means 10 is formed such that the contact elements 13 are arranged approximately parallel to the spring system 4, 5 and/or to the first guide element 31. It is, however, within the scope of the invention as well that the contact means 14 are arranged on the means 10 such that the contact elements 13 are arranged at a right angle to the spring system 4, 5 or to the first guide element 31 and thus approximately parallel to the second guide element 32.

[0067] The first spring element 41, 51 of the spring system 4, 5 comprises at its free end opposite the web 43, 53 at least one surface 44, 54 formed orthogonal to the web 43, 53. This surface 44, 54 of the spring system 4, 5 results on the one hand in an easy displaceability of the coupling element 3 on the side wall 2 of the cable conduit element 1 and lies, when installed as shown in Fig. 1, on the face side of the face wall 2 of the cable conduit element 1 so that it is arranged flush with the outer side of the side wall 2 of the cable conduit element 1.

[0068] A further advantage of this embodiment of the coupling element 3 is that the first spring element 41 of the first spring system 4 is arranged approximately parallel offset opposite to the first spring element 51 of the second spring system 5.

[0069] This advantageously means that, in particular when installed as shown in Fig. 1, the coupling element 3 is positioned by the first spring system 4 on the face side of the side wall 2 of the cable conduit element 1 so that it cannot be displaced and is fastened to the side wall 2 of the cable conduit element 1 by the second spring system 5.

[0070] Figure 3 shows a perspective representation of the coupling element 3 as well as the means 10 of the cable conduit system according to the invention at a distance thereto. The coupling element 3 comprises the spring systems 4, 5, which are arranged approximately parallel to the first guide system 31. Furthermore, the coupling element 3 comprises a second guide element 32, which projects away approximately orthogonal to the first guide system 31.

[0071] The first guide element 31 and the second guide element 32 encompass a receiving space into which the means 10 can be inserted.

[0072] The coupling element 3 further comprises in this embodiment two recesses 30, which are arranged approximately parallel to the same between the spring system 4, 5 and the first guide

element 31. The recess 30 has a depth in this embodiment that approximately corresponds to the wall thickness of the coupling element 3.

[0073] In the recess 30 of the coupling element 3, two engagement elements 8 each as well as a positioning element 7 are arranged in this embodiment.

[0074] The positioning element 7 has a height in this embodiment that approximately corresponds to the height of the first guide element 31.

[0075] The engagement elements 8, which are arranged in this example approximately equidistant from the positioning element 7 in the recess 30 of the coupling element 3, have a height that is greater than the wall thickness of the coupling element 3 in this embodiment, approximately 3 mm.

[0076] It is, however, within the scope of the invention as well that the engagement element 8 as well as the positioning element 7 can be arranged at any position of the coupling element 3. This depends on the respective requirements of the cable conduit elements 1 as well as the means 10 to be connected with the coupling element 3.

[0077] The means 10, which is made of the metallic material steel in this embodiment, has a rectangular shape and comprises an opening 15 at its center. The opening 15 is dimensioned such that it encompasses, when the means 10 on the coupling element 3 is used as intended, the spring systems 4, 5 of the coupling element 3 and covers the openings 9.

[0078] The means 10 further has an opening 12 at each of its free ends on which two contact means 14 are arranged at a distance from one another.

[0079] The contact means 14 comprise a contact element 13, which is integrally connected to the means 10 by a connecting means 11. The contact element 13 of the means 10 is arranged in this embodiment approximately at a right angle to the surface of the means 10 and has an approximately triangular cross-section.

[0080] It is, however, within the scope of the invention as well that the contact element 13 has a plurality of triangularly formed contact elements on the connecting means 11. The contact means 14 are arranged in this embodiment such that the contact element 13 is arranged approximately parallel to the longitudinal side of the means 10.

[0081] The contact means 14 are arranged opposite one another at a distance from each other in the opening 12 of the means 10. It is, however, within the scope of the invention as well that, in particular, the contact element 13 is arranged on the means 10 such that it is arranged approximately parallel to the narrow free ends of the means 10.

[0082] It is further possible that the means 10 may comprise contact means 14 arranged in the opening 15, which are not shown here.

[0083] The means 10 also comprises in this embodiment one recess 16 each, which is arranged parallel to the longitudinal sides and which are arranged between the openings 12 and parallel to

the opening 15. These recesses 16 of the means 10 have in this embodiment a depth of approximately 2 mm.

[0084] The depth of the recess 16 of the means 10 approximately corresponds in this embodiment to the depth of the recess 30 of the coupling element 3.

[0085] Openings 17 and 18 are provided in the recess 16 of the means 10. The opening 17 has a circular shape in this embodiment and can be applied to the circularly formed positioning elements 7 when the means 10 is installed on the coupling element 3. The openings 18 in the recess 16 are prismatically formed in this embodiment and arranged equidistant to the opening 17.

[0086] When the means 10 is installed on the coupling element 3 as intended, a positioning of the opening 17 on the positioning element 7 is performed and subsequently the means 10 is inserted into the receiving space of the coupling element 3 that is created by the first guide element 31 and the second guide element 32, and a positive connection is made by the rear engagement of the engagement elements 8 arranged in the recess 30 of the coupling element 3 in the openings 18 of the means 10.

[0087] The means 10 is therefore arranged in or on the coupling element 3 in a positive fit and can, when the cable conduit system according to the invention is removed and disposed of, be separated from the coupling element 3, which is made from a polymer material, and disposed of.

[0088] It is, however, within the scope of the invention as well that the means 10 is adhesively fastened to the coupling element 3 with bondings and/or welds that are generally known.

[0089] The recess 16 of the means 10 has in this embodiment a width of approximately 20% of the width of the means 10, in this embodiment approximately 7 mm.

[0090] Furthermore, the recess 16 of the means 10 has a length that corresponds to approximately 65% of the total length of the means 10, in this embodiment approximately 63 mm.

[0091] It is, however, within the scope of the invention as well that the means 10 and/or the coupling element 3 has smaller or larger dimensioned recesses 16, 30, which always depends on the required rigidity or stability of the means 10 and/or the coupling element 3.

[0092] A further advantage of this embodiment is that if the means 10 is installed on the coupling element 3 as intended, the recess 16 of the means 10 is arranged in the recess 30 of the coupling element 3 and when the coupling element 3 with the means 10 is installed on the side walls 2 of a cable conduit element 1, the recess 16 is in a working connection with the recess 30 such that the means 10 cannot be displaced by the coupling element 3.

[0093] The cable conduit system according to the invention comprising cable conduit elements 1, which can be easily and cost-effectively as well as quickly joined in their longitudinal direction by means of at least one coupling element 3, thus leads to a faster and more cost-effective installation than previously known from prior art.

Patentkrav

1. Kabelkanalsystem, som omfatter kabelkanalelementer (1), minst ett koblingselement (3), og minst ett element (10), hvori kabelkanalelementene (1) kan er forenet med hverandre i sin lengderetning med hjelp av nevnte minst ett koblingselement (3), og koblingselementet (3) er laget av et ikke-elektrisk ledende materiale, hvori kabelkanalelementene (1) består av en hovedsakelig U-formet kanal-under-del, samt, særlig, et deksel som kan være arrangert på underdelen, hvori koblingselementet (3) er ført inn på en frigjørbar og/eller forskyvbar måte inn i de frie endeområdene av kabelkanalelementene (1), hvori koblingselementet (3), som er ført i endeområdene av et kabelkanalelement (1) på minst én av sideveggene (2), omfatter minst to fjærsystemer (4, 5), **karakterisert ved at** koblingselementet (3) er konfigurert hovedsakelig rektangulært over nevnte minst ett element (10) som er laget i det minste delvis av et elektrisk ledende materiale, og oppviser i sentrum en åpning (15) som er dimensjonert på en slik måte at den omgir fjærsystemene (4, 5), og omfatter ved motsatte ender minst ett kontaktmiddel (14), hvor det ved den frie enden av hvilket er arrangert minst ett kontaktelement (13) konfigurert med triangulært tverrsnitt, og er forbundet ved metallurgisk forening, ikke-friksjonsmessig og/eller friksjonsmessig inngrep med koblingselementet (3), distansert i en avstand fra sideveggen (2) av kabelkanalelementet (1), i arbeidende forbindelse med elementet, hvori kontaktelementene (13) er i kontakt ved motsatte ender av elementet (10) hver med ett av to kabelkanalelementer (1) montert på den flate siden, og etablerer en elektrisk arbeidende forbindelse mellom kanalelementene (1) med det formål å oppnå potensial-utliknende binding.

2. Kabelkanalsystem ifølge krav 1, **karakterisert ved at** elementet (10) oppviser minst én ekstra åpning (12).

3. Kabelkanalsystem ifølge krav 1, **karakterisert ved at** kontaktelementet (13) er forbundet via minst ett forbindelsesmiddel (11) med elementet (10).

4. Kabelkanalsystem ifølge krav 2, **karakterisert ved at** to kontaktmidler (14) er arrangert mot hverandre ved åpningen (12) av elementet (10).

5. Kabelkanalsystem ifølge ett av kravene foran, **karakterisert ved at** fjærsystemene (4, 5) er arrangert omtrent parallelt over en åpning (6), distansert i en innbyrdes avstand, hvori et første fjærelement (41, 51) er forbundet med et andre fjærelement (42, 52), men innbyrdes distansert av minst ett steg (43, 53).

6. Kabelkanalsystem ifølge ett av kravene foran, **karakterisert ved at** koblingselementet (3) omfatter minst ett inngrepselement (8) som rager fra dets overflate, med hjelp av hvilket elementet (10) kan være forbundet med samme på en formtilpasset måte.

7. Kabelkanalsystem ifølge ett av kravene foran, **karakterisert ved at** elementet (10) er arrangert ved dets frie ender, for slik å være avgrenset av minst ett styreelement (31, 32) ved koblingselementet (3).

8. Kabelkanalsystem ifølge krav 5, **karakterisert ved at** koblingselementet (3) i den installerte tilstanden er i kontakt med hjelp av minst ett steg (43, 53) i fjærsystemet (4, 5) på forsiden av sideveggen (2) av kabelkanalelementet (1).

9. Kabelkanalsystem ifølge krav 5, **karakterisert ved at**, i den installerte tilstanden, én overflate (44, 54) av fjærsystemet (4, 5) er i kontakt hovedsakelig i flukt med yttersiden av sideveggen (2) av kabelkanalelementet (1).

Fig. 1

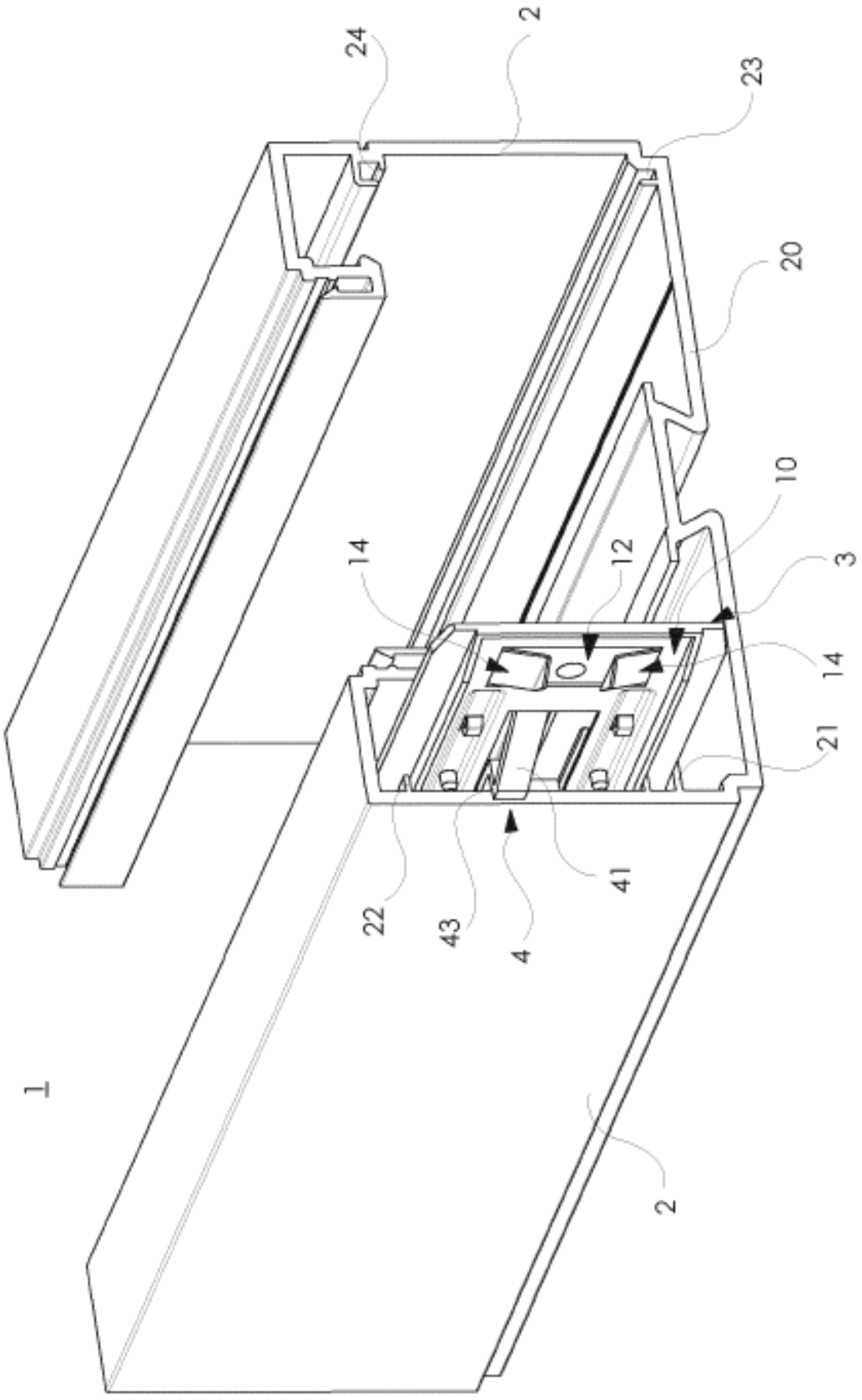

Fig. 2

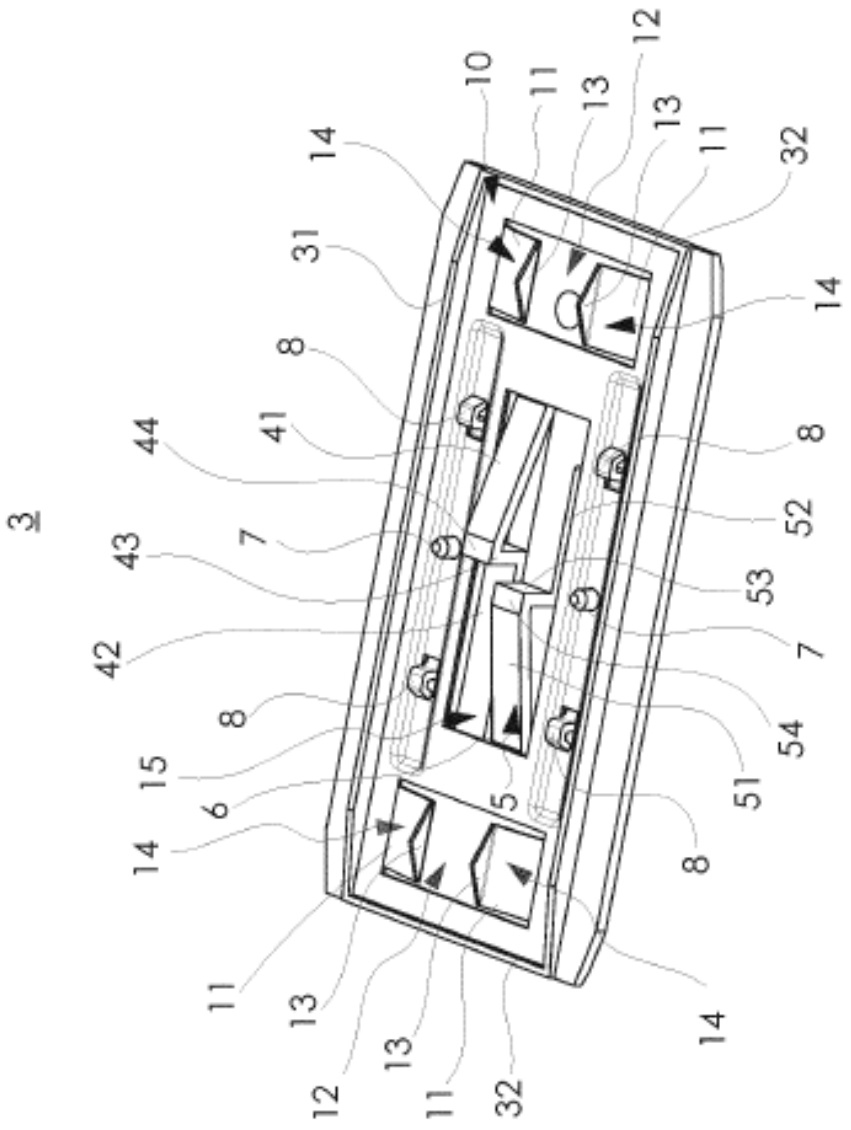
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Fig. 3