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TRACK CONNECTOR FOR A CUTTING SAW TRACK GUIDE

Abstract

A track guide for a cutting saw power tool allows the saw to slide along a track. The guide has two track sections, each with longitudinal channels. A track connector joins these sections. The connector has an elongated body with portions fitting into the channels of each track section. A rotary securing element on the connector has a cam profile and can rotate between two positions. In the first position, the connector moves freely within the channels. In the second position, the element engages the channel walls, locking the connector and securing the track sections together.

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Background/Summary

SUMMARY

[0001] The present invention relates to a track connector for a cutting saw track guide and a cutting saw track guide. More particularly, the present invention relates to an improved track connector for connecting track sections of a track guide for a cutting saw power tool.

[0002] Cutting saw track guides enable accurate, straight long cuts to be made. A track-adapted cutting saw is more convenient and space-efficient than a table saw and the use of track-adapted cutting saws enables materials such as aluminium sheet, mild steel plate, plastics, wood, plywood and MDF, as well as doors and decorative panels, to be cut in lengths up to around 3 m in some configurations.

[0003] However, assembly and connection of tracks can be problematic. Conventional methods such as the use of screws or bolts are cumbersome to assemble and disassemble and may cause damage to the track sections over time. A solution is needed which enables quick and efficient assembly whilst providing a sufficiently robust structure to support cutting of materials using track-adapted cutting saw power tool.

[0004] The present invention seeks, in embodiments, to address these known disadvantages.

[0005] According to a first aspect of the present invention, there is provided A track guide for a cutting saw power tool, the track guide being arranged in use to engage with a cutting saw power tool such that the cutting saw power tool is operable to slide back and forth in a longitudinal direction along the track, the track guide comprising: first and second track sections, each track section having at least one longitudinal channel arranged substantially parallel to the longitudinal direction; and at least one track connector, the or each track connector comprising an elongate main body configured and arranged such that, in use, a first portion of the elongate main body is received within a longitudinal channel of the first track section and a second portion of the elongate main body of the track member is received within a corresponding longitudinal channel of the second track section in order to connect the first and second track sections in a longitudinal direction; wherein each track connector comprises at least one rotary securing element comprising an engagement portion having a cam profile, wherein the or each rotary securing element is selectively rotatable about an axis of rotation between a first rotational orientation in which the track connector is free to move with respect to the respective longitudinal channel and a second rotational orientation in which the track connector is releasably engaged with one or more walls of a respective channel such that the track connector is held within the respective channel.

[0006] In one embodiment, the first and second rotational orientations are angularly spaced by 90 degrees or less.

[0007] In one embodiment, the engagement portion of the or each rotary securing element is spaced from one or more walls of the respective channel in the first rotational orientation. In one embodiment, the engagement portion of the or each rotary securing element is configured and arranged to engage directly with one or more of the walls of the respective channel in the second rotational orientation.

[0008] In one embodiment, the engagement portion of the or each rotary securing element is configured and arranged to engage directly with two opposing walls of the respective channel in the second rotational orientation.

[0009] In one embodiment, the elongate main body comprises first and second portions, and wherein the engagement portion of the or each rotary securing element is operable, in the second rotational orientation, to cause the first and second portions to engage with one or more of the walls of the respective channel.

[0010] In one embodiment, the engagement portion of the or each rotary securing element has a cam profile having rotational symmetry of the order of one or two.

[0011] In one embodiment, the engagement portion of the or each rotary securing element has an elliptical cam profile.

[0012] In one embodiment, the engagement portion of the or each rotary securing element has a circular cam profile having a centre offset from the axis of rotation of the respective rotary securing element.
[0013] In one embodiment, the or each rotary securing element is located in a respective recess formed in the elongate main body.
[0014] In one embodiment, a plurality of rotary securing elements are provided on each track connector.
[0015] In one embodiment, four rotary securing elements are provided on each track connector.
[0016] According to a second aspect of the present invention, there is provided a track connector for connection of first and second sections of a track guide for a cutting saw power tool, the track guide being arranged in use to engage with a cutting saw power tool such that the cutting saw power tool is operable to slide back and forth in a longitudinal direction along the track guide, the first and second track sections each having at least one longitudinal channel arranged substantially parallel to the longitudinal direction, wherein the track connector comprises: an elongate main body configured and arranged such that, in use, a first portion of the elongate main body is received within a longitudinal channel of the first track section and a second portion of the elongate main body is received within a corresponding longitudinal channel of the second track section in order to connect the first and second track sections in a longitudinal direction; and at least one rotary securing element comprising an engagement portion having a cam profile, the or each rotary securing element being selectively moveable between a first rotational orientation in which, in use, the track connector is free to move with respect to the respective longitudinal channel and a second rotational orientation in which, in use, the track connector is releasably engaged with a sidewall of a respective channel such that the track connector is held within the respective channel.
[0017] In one embodiment, the first and second rotational orientations are angularly spaced by 90 degrees or less.
[0018] In one embodiment, the engagement portion of the or each rotary securing element is spaced from one or more walls of the respective channel in the first rotational orientation.
[0019] In one embodiment, the engagement portion of the or each rotary securing element is configured and arranged to engage directly with one or more of the walls of the respective channel in the second rotational orientation.
[0020] In one embodiment, the engagement portion of the or each rotary securing element is configured and arranged to engage directly with two opposing walls of the respective channel in the second rotational orientation.
[0021] In one embodiment, the elongate main body comprises first and second portions, and wherein the engagement portion of the or each rotary securing element is operable, in the second rotational orientation, to cause the first and second portions to engage with one or more of the walls of the respective channel.
[0022] In one embodiment, the engagement portion of the or each rotary securing element has a cam profile having rotational symmetry of the order of one or two.
[0023] In one embodiment, the engagement portion of the or each rotary securing element has an elliptical cam profile.
[0024] In one embodiment, the engagement portion of the or each rotary securing element has a circular cam profile having a centre offset from the axis of rotation of the respective rotary securing element.
[0025] In one embodiment, the or each rotary securing element is located in a respective recess formed in the elongate main body.
[0026] In one embodiment, a plurality of rotary securing elements are provided on each track connector.
[0027] In one embodiment, four rotary securing elements are provided on each track connector.

Description

BRIEF DESCRIPTION OF FIGURES

[0028] Embodiments of the invention will now be described with reference to the following figures in which:

[0029] FIG. **1** shows a front perspective view of a track saw arrangement comprising a cutting saw power tool and a track guide according to an embodiment of the present invention;

[0030] FIG. **2** shows front perspective view of a track guide according to an embodiment;

[0031] FIG. **3** shows a top plan view of the track guide of FIG. **2**;

[0032] FIG. **4** shows an underside plan view of the track guide of FIG. **2**;

[0033] FIG. **5** shows a front view of the track guide and cutting saw power tool illustrating the engagement therebetween;

[0034] FIG. **6** shows a perspective view of a track connector according to a first embodiment of the present invention;

[0035] FIG. **7** shows a detailed view of a part of the track connector of FIG. **6**;

[0036] FIG. **8** shows a plan view of a securing element forming part of the track connector of FIGS. **6** and **7**;

[0037] FIG. **9** shows a perspective view of the securing element of FIG. **8**;

[0038] FIG. **10** shows a plan view of the securing element of FIG. **8** in a first rotational position in use;

[0039] FIG. **11** shows a plan view of the securing element of FIG. **8** in a second rotational position in use;

[0040] FIGS. **12**A to **12**D show examples of different forms of securing element according to embodiments of the invention;

[0041] FIG. **13** shows a perspective view of a track connector according to a second embodiment of the present invention; and

[0042] FIG. **14** shows an exploded view of the components of the track connector of FIG. **13**.

DETAILED DESCRIPTION

[0043] FIG. **1** shows a track saw arrangement **10**. The track saw arrangement **10** comprises a cutting saw power tool **50** and a track guide **100** according to an embodiment.

[0044] The cutting saw power tool **50** is, in embodiments, in the form of a circular saw **50**. However, this is not to be taken as limiting and any cutting saw suitable for track use and performing long straight cuts may be used, for example, other types of circular saw, jigsaws or routers may be used with the present invention.

[0045] The circular saw **50** is arranged to engage with the track guide **100** and slide there along in a longitudinal cutting direction C parallel to a longitudinal axis X-X of the track guide **100**. The circular saw **50** comprises a main body **52**, comprising a blade housing **54** and a handle arrangement **56**. A circular saw blade **58** (FIG. **5**) is contained within the blade housing **54**. A base **60** of the circular saw **50** is shaped and configured to engage with the track guide **100**.

[0046] The track guide **100** comprises first and second track sections **102**, **104**. In embodiments, each track section **102**, **104** has the same configuration and is interchangeable. However, this is not to be taken as limiting and the sections may in principle be different in structure provided they can be connected to form a continuous length of track. For example, connectable track sections **102**, **104** may be the same length or have different lengths. In specific embodiments, track sections **102**, **104** may have lengths of 330, 700 and 1400 mm. However, these are not to be taken as limiting and any suitable length of track section may be used.

[0047] In addition, although only two track sections **102**, **104** are shown, this is not to be taken as limiting and any number of track sections may be connected together to form any suitable length of track.

[0048] FIGS. **2** to **5** show the track guide **100** in more detail. FIG. **2** shows a perspective view of the track guide **100** comprising first and second track sections **102**, **104** connected to one another. FIGS. **3** and **4** show a top view and a lower view of the track guide **100** shown in FIG. **2**. FIG. **5** shows a front view of the track guide **100** and cutting saw **50** engaged with one another as would typically be the case during a cutting operation.
[0049] As shown in FIGS. **2** to **4**, each track section **102**, **104** comprises a main body **106** formed, in embodiments, from extruded aluminium. However, any other suitable metal or forming process may be used. The main body **106** has a constant cross-sectional profile parallel to the longitudinal axis X-X. The main body **106** has an upper surface **108** which is generally planar and upon which the cutting saw **50** can slide in the longitudinal direction C in use, and a lower surface **110** for engagement with a suitable support surface (not shown).
[0050] Longitudinal guide strips **108***a*, **108***b*, **108***c* are formed on the upper surface **108**. The guide strips **108***a*, **108***b*, **108***c* may be formed from any suitable material. In embodiments, the guide strips **108***a*, **108***b*, **108***c* are formed from a low friction resistance hard plastics material and comprise longitudinal strakes parallel to the longitudinal axis X-X. This configuration allows the cutting saw **50** to slide back and forth easily on the track guide **100**. The guide strips **108***a*, **108***b*, **108***c* are configured and arranged to enable the cutting saw **50** to slide easily along the track sections **102**, **104** without damage such as scratching or grazing.
[0051] In embodiments, longitudinal strips **110***a*, **110***b*, **110***c* are provided on the lower surface **110**. Strip **110***a* comprises a sacrificial edge upon which the cutting saw **50** is guided in use. Strip **110***a* is formed from a material such as ABS. Longitudinal strips **110***b*, **110***c* form gripping elements to enable the track guide **100** to remain stationary on a support surface and not slide. Strips **110***b*, **110***c* may be formed from neoprene or ethylene propylene diene terpolymer (EPDM).
[0052] Two raised channels **112**, **114** are provided in the main body **106** which extend parallel to the longitudinal axis X-X. Each channel **112**, **114** has a constant cross section in the longitudinal direction X-X and is open at each end and on either an upper or a lower side thereof.
[0053] Channel **112** is delimited by three channel walls and has a longitudinal opening in the lower surface **110** of the main body **106**. The channel **112** is also delimited by three channel walls and has a longitudinal opening on the upper surface **108** of the main body **106**. A narrow flange or lip delimits the longitudinal opening of each channel **112**, **114** and forms a perpendicular extension or lip attached to the adjacent wall for each channel **112**. **114**. In embodiments, the channels **112**, **114** have a width of approximately 12-13 mm.
[0054] However, the described embodiment is non-limiting and any suitable arrangement of channels **112**, **114** may be used. For example, channels **112**, **114** may, in embodiments, both have openings in the upper surface **108** or both channels **112**, **114** may have both openings in the lower surface **110**. The channels **112**, **114** may be placed in any suitable spatial relationship to one another. For example, they may be closer together or further apart than shown in this embodiment. In addition, further channels **112**, **114** may be provided if required.
[0055] Both channels **112**, **114** form elongate raised portions of the upper surface **108** as shown in FIG. **2**. A feature of this is shown in FIG. **5**. FIG. **5** shows a front view (i.e. head on towards the cutting saw along the axis X-X) of the cutting saw **50** in situ on the track guide **100**.
[0056] As shown, the channel **112** engages with a complementary longitudinal recess **62** formed in the base **60** of the cutting saw **50**. When the cutting saw **50** is placed on the track guide **100**, the recess **62** engages with the channel **112**. In addition, a sidewall **118** of the main body **106** is located adjacent the blade housing **54** of the cutting saw **50**. These two engagements enabled the cutting saw **50** to slide back and forth along the axis X-X in the cutting direction without deviation.
[0057] The channels **112**, **114** facilitate connection of the track sections **102**, **104** as will be described below. In embodiments, the track sections **102**, **104** are separate components and require connection. Whilst they comprise complimentary abutment surfaces at the end of each track section **102**, **104**, it is necessary for a connector to be used to secure the track sections **102**, **104** together.

[0058] To achieve this, a track connector **150** is provided. In specific embodiments, two track connectors are used to secure the track sections **102**, **104** together.
[0059] A first embodiment of a track connector **150** is shown in FIG. **6**. Connectors **150** are also shown in FIGS. **1** to **5**. As shown, the track connector **150** comprises a generally elongate body **152** having a rectangular cross section. The elongate body **152** is formed from a suitable material such as metal (for example, steel or aluminium) or a plastics material. However, any suitable material may be used.
[0060] The elongate body **152** of the track connector **150** is dimensioned and arranged to fit slidably within one of the channels **112**, **114** as shown in FIGS. **1** to **5**. By slidably fitted within a channel **112**, **114** is meant that the track connector **150** is dimensioned and arranged such that it is smaller in cross section than the channels **112**, **114** such that the track connector **150** may slide back and forth within the channel(s) **112**, **114** without significant force being required, i.e. the fit is not frictional.
[0061] In addition, the track connector **150** is dimensioned and arranged such that there is relatively little play when within a channel **112**, **114**. In embodiments, the dimensions of the cross-section of the elongate body **152** of the track connector **150** and the width of each channel **112**, **114** are selected to enable ease of fitment of the track connector **150** in a channel **112**, **114** without excess play.
[0062] To achieve this, the track connector **150** may have a width which is 2 mm or less than the width of the respective channel **112**, **114**. In embodiments, the track connector **150** may have a width which is 1.5 mm less than the width of the respective channel **112**, **114**. In specific embodiments, the track connector **150** has a width of 11.5 mm and the channel **112**, **114** may have a width between 11.8 mm and 12.8 mm.
[0063] In use, one end of a track connector **150** is inserted into a channel **112**, **114** of the first track section **102** and an opposite end of the track connector **150** is inserted into a corresponding channel **112**, **114** of the second track section **104**. A marker **154** is formed in the elongate body **152** of the track connector **150** to indicate a halfway point at which the two track sections **102**, **104** should meet.
[0064] In order to secure the track sections **102**, **104** to one another, the track connector **150** must be of sufficient length to provide necessary structural support and strength to ensure that the two track sections **102**, **104** do not flex relative to one another and can support the load of the cutting saw **50** moving there along. In embodiments, the track connector **150** may have an overall length in the region of 300-400 mm. In specific embodiments, the track connector **150** has an overall length of 320 mm.
[0065] However, because the track connector **150** is slidably received in a channel **112**, **114** for convenience of assembly, it is necessary to further secure the track connector **150** within a channel **112**, **114** so that each track section **102**, **104** is prevented from moving relative to one another in a direction parallel to the axis X-X, and so that the track sections **102**, **104** are robustly retained as a unit without significant play therebetween.
[0066] To achieve this, securing elements **156** are provided along the length of the track connector **150**. In embodiments four securing elements **156-1**, **156-2**, **156-3**, **156-4** are provided on each track connector **150**. However, any suitable number of securing elements may be provided as required.
[0067] FIG. **7** shows an enlarged view of two securing elements **156-2**, **156-3**. In embodiments, the securing elements **156-1**, **156-2**, **156-3**, **156-4** are located within recesses **158** formed in the upper and side surfaces of the elongate body **152** of the track connector **150**. The recesses **158** are dimensioned and arranged such that the securing elements **156-1**, **156-2**, **156-3**, **156-4** do not extend beyond the upper surface of the elongate body **152**.
[0068] The securing elements **156-1**, **156-2**, **156-3**, **156-4** comprise rotary securing elements **156-1**, **156-2**, **156-3**, **156-4** which are operable to rotate in use. The securing elements **156-1**, **156-2**, **156-3**, **156-4** are shown removed from the remainder of the track connector **150** in FIGS. **8** and **9**.

[0069] As shown in these figures, the securing elements **156** each comprise a cylindrical main body **160** having an axis of rotation Y-Y. A concentric fixing element **162** is connected at the base of the main body **160** which enables the securing element **156** to be connected to the elongate main body **152** of the track connector **150**. In embodiments, the main body **160** extends through a through hole (not shown) located in the recess **158** in the elongate main body **152**, and the fixing element **162** is secured at the base thereof. The fixing element **160** may take the form of a snap ring. However, any suitable arrangement may be used in which the securing element **156** is rotatably retained within the elongate main body **152** of the track connector **150**.
[0070] At an upper end of the cylindrical main body **160** is formed a hexagonal aperture **164** operable to receive an Allen key or other user-operated device adapted to cause rotation of the securing element **156** to a desired position in use, as described below.
[0071] An asymmetric engagement portion **166** is formed on the cylindrical main body **160**. By asymmetric is meant that the profile of the engagement portion **166** varies around the perimeter of the engagement portion **166** such that the distance between an outer surface of the engagement portion **166** and the axis Y-Y varies around the perimeter of the engagement portion **166**.
[0072] In other words, the engagement portion **166** comprises a cam having a cam profile and is arranged, in use, to selectively engage a sidewall of a channel **112**, **114**. In embodiments, the engagement portion **166** has an elliptical shape. The elliptical shape has technical advantages in that it provides two engagement surfaces which, in use, engage with both opposing sidewalls of a channel **112**, **114**.
[0073] In embodiments, the major and minor axes of the elliptical cam of the engagement portion **166** are selected to ensure robust engagement of and suitable disengagement from the sidewalls of a channel **112**, **114**. In specific embodiments, where a channel **112**, **114** has a width between 12.2 mm and 12.6 mm, the minor axis of the elliptical cam may be in the range of 11 to 11.8 mm and the major axis of the elliptical cam may be in the range of 12.85 mm to 13.25 mm.
[0074] However, any suitable shape or form to create some degree of rotational asymmetry about the axis of rotation Y-Y may be used. Suitable variations are described below in relation to FIG. **12**A-FIG. **12**D.
[0075] In embodiments, the securing element **156** may be formed from a suitable metal such as steel. In embodiments, the securing element **156** is formed from cold forged steel. However, other metals may be used such as aluminium or alloys thereof.
[0076] FIGS. **10** and **11** show the operation of the securing element **156** and asymmetric engagement portion **166**. FIGS. **10** and **11** show a plan view parallel to the longitudinal axis X-X and perpendicular to the rotational axis Y-Y of part of the track connector **150** when located within channel **112**. This would equally apply to channel **114**.
[0077] FIG. **10** shows the securing element **156** in a first, disengaged, rotational position where the engagement portion **166** is contained within the cross-section of the elongate main body **152** of the track connector **150** and does not extend beyond the lateral extent of the elongate body **152**. In this configuration, the track connector **150** is free to slidably move within the channel **112** to enable insertion, positioning or removal.
[0078] FIG. **11** shows the securing element **156** in a second, engaged, rotational position in which the engagement portion **166** contacts both sidewalls of the channel **112** and engages therewith. In this configuration, the track connector **150** is retained in the channel **112** to enable the first and second track sections **102**, **104** to be securely retained with respect to one another.
[0079] Note that only one securing element **156** is shown in FIGS. **10** and **11** for clarity. In the described embodiments, four securing elements **156-1**, **156-2**, **156-3**, **156-4** are provided and each would be rotated to the engaged position to secure the track connector **150** in the channel and retain and connect the first and second track sections **102**, **104** to one another.
[0080] Further, it is noted that the first and second rotational positions are not discrete and the securing elements **156** may be rotated to any suitable position. Intermediate positions may be

possible. In addition, angularly spaced detents may be provided to cause the securing elements to be retained in certain positions which may include the first and second positions.
[0081] By providing an engagement portion having an elliptical profile, both sidewalls can advantageously be engaged in the second rotational position. This improves the robustness of the engagement between the track connector **150** and the respective channel **112**, **114**.
[0082] In addition, the elliptical profile provides a suitable cam profile for progressive engagement with the sidewalls of the channels **112**, **114** such that the track connector **150** is held securely without slippage. In other words, the ramp angle of the cam profile is suitable for engaging and retaining the track connector **150** in the channel **112**, **114**.
[0083] However, other profiles and configurations of the engagement portion **166** of the securing element **156** may be provided. FIG. **12**A-FIG. **12**D show four alternative engagement portion structures **166**A, **166**B, **166**C, **166**SD suitable for use with embodiments of the present invention.
[0084] FIG. **12**A shows an elliptical engagement portion **166**A profile which has an exaggerated difference between major and minor axes when compared to the example of the first embodiment. This example, being an ellipse, has a rotational symmetry of the order **2** in that the engagement portion **166**A is symmetrical through a rotation of 180 degrees. This configuration has the advantage that both sides of a channel **112**, **114** can be engaged simultaneously to secure the track connector **150** in situ.
[0085] FIG. **12**B shows an alternative cam shape and profile for engagement portion **166**B in which a circular profile having an extended lobe is provided. This configuration has a rotational symmetry of the order **1**, i.e. rotationally asymmetric. This configuration will, in use, only engage with one sidewall of a channel **112**, **114**.
[0086] FIG. **12**C shows a further alternative cam shape and profile for engagement portion **166**C comprising a snail/drop cam in which a cam ramp is rotationally followed by a sharp drop. This profile is repeated on the opposite side such that the engagement portion **166**C is symmetrical through a rotation of 180 degrees. This configuration has the advantage that both sides of a channel **112**, **114** can be engaged simultaneously to secure the track connector **150** in situ.
[0087] Finally, FIG. **12**D shows an engagement portion **166**D having a circular profile cam but with the axis of rotation Y-Y offset from the centre of the circle to create an eccentric profile. This configuration has a rotational symmetry of the order **1**, i.e. rotationally asymmetric about the axis Y-Y. This configuration will, in use, only engage with one sidewall of a channel **112**, **114**.
[0088] The inventors have found that, for the first time, rotational securing elements **156** can be effectively utilised to secure a track connector **150** within a channel **112**, **114**. This has the surprising technical effect of being able to retain the track connector **150** within the channel **112**, **114** in a robust and reliable manner, connecting the first and second track sections **102**, **104** together securely with limited play and with resistance to vibration and other environmental factors that may cause loosening of the connection therebetween, whilst also facilitating straightforward assembly and disassembly of the track sections when required. In addition, this can be achieved with, in embodiments, metal securing elements which further improves the robustness of the connection.
[0089] FIGS. **13** and **14** show a second embodiment of track connector **250**. The track connector **250** comprises a generally elongate body having first and second sections **252***a*, **252***b* each having a rectangular cross section. The elongate body sections **252***a*, **252***b* are formed from a suitable material such as metal (for example, steel or aluminium) or a plastics material. However, any suitable material may be used.
[0090] The elongate body sections **252***a*, **252***b* of the track connector **250** are dimensioned and arranged such that, in a first configuration, they fit slidably within one of the channels **112**, **114** as shown in FIGS. **1** to **5**. By slidably fitted within a channel **112**, **114** is meant that the track connector **250** is dimensioned and arranged such that it is smaller in cross section than the channels **112**, **114** such that the track connector **250** may slide back and forth within the channel(s) **112**, **114**

without significant force being required, i.e. the fit is not frictional.
[0091] As for the first embodiment, because the track connector **250** is slidably received in a channel **112**, **114** for convenience of assembly, it is necessary to further secure the track connector **250** within a channel **112**, **114** so that each track section **102**, **104** is prevented from moving relative to one another in a direction parallel to the axis X-X, and so that the track sections **102**, **104** are robustly retained as a unit without significant play therebetween.
[0092] To achieve this, rotary securing elements **256** are provided along the length of the track connector **150**. In embodiments two rotary securing elements **256-1**, **256-2** are provided on each track connector **150**. However, any suitable number of securing elements may be provided as required.
[0093] The second embodiment differs from the first embodiment in that the securing elements **256** themselves do not engage with the sidewalls of the channels **112**, **114**. Instead, the rotary securing elements **256-1**, **256-2** change the spacing between the first and second elongate body sections **252***a*, **252***b* which selectively engage or disengage with the sidewalls of the respective channel **112**, **114**.
[0094] In order to achieve this, the rotary securing elements **256** have an axis of rotation Y-Y and at least one surface which is asymmetric with respect to the axis of rotation Y-Y such that in a first rotational position the track connector **250** is free to move along the channel **112**, **114** and in a second rotational position the track connector **250** is retained in the respective channel **112**, **114**.
[0095] In order to facilitate the transition between a first disengaged rotational position and a second engaged rotational position, two spring elements **158**, **158** are provided. Spring elements **158** resiliently bias the first and second elongate body sections **252***a*, **252***b* towards one another.
[0096] It is noted that the first and second rotational positions are angularly spaced but not discrete and the securing elements **256** may be rotated to any suitable position. Intermediate positions may be possible. In addition, angularly spaced detents may be provided to cause the securing elements to be retained in certain positions which may include the first and second positions.
[0097] In embodiments, the present invention enables a track connector to be used and secured to connect two track sections in a convenient and quick manner. In embodiments, a rotary securing element is rotatable to cause a part of the track connector to selectively engage or disengage a sidewall of a channel in which it is contained therein. This has significant advantages over, for example, using grub screws or other securing means which may cause damage to parts of the track guide **100** and may wear or loosen over time.
[0098] Variations of the above embodiments will be apparent to the skilled person. The precise configuration of components may differ and still fall within the scope of the present invention.
[0099] For example, whilst two embodiments of rotary securing elements have been described, these are not intended to be limiting and other configurations may be possible.
[0100] Embodiments of the present invention have been described with particular reference to the examples illustrated. While specific examples are shown in the drawings and are herein described in detail, it should be understood, however, that the drawings and detailed description are not intended to limit the invention to the particular form disclosed. It will be appreciated that variations and modifications may be made to the examples described within the scope of the present invention.

Claims

1. A track guide for a cutting saw power tool, the track guide being arranged in use to engage with a cutting saw power tool such that the cutting saw power tool is operable to slide back and forth in a longitudinal direction along the track, the track guide comprising: first and second track sections, each track section having at least one longitudinal channel arranged substantially parallel to the longitudinal direction; and at least one track connector, the or each track connector comprising an

elongate main body configured and arranged such that, in use, a first portion of the elongate main body is received within a longitudinal channel of the first track section and a second portion of the elongate main body of the track member is received within a corresponding longitudinal channel of the second track section in order to connect the first and second track sections in a longitudinal direction; wherein each track connector comprises at least one rotary securing element comprising an engagement portion having a cam profile, wherein the or each rotary securing element is selectively rotatable about an axis of rotation between a first rotational orientation in which the track connector is free to move with respect to the respective longitudinal channel and a second rotational orientation in which the track connector is releasably engaged with one or more walls of a respective channel such that the track connector is held within the respective channel.

2. A track guide according to claim 1, wherein the first and second rotational orientations are angularly spaced by 90 degrees or less.

3. A track guide according to claim 1, wherein the engagement portion of the or each rotary securing element is spaced from one or more walls of the respective channel in the first rotational orientation.

4. A track guide according to claim 1, wherein the engagement portion of the or each rotary securing element is configured and arranged to engage directly with one or more of the walls of the respective channel in the second rotational orientation.

5. A track guide according to claim 4, wherein the engagement portion of the or each rotary securing element is configured and arranged to engage directly with two opposing walls of the respective channel in the second rotational orientation.

6. A track guide according to claim 1, wherein the elongate main body comprises first and second portions, and wherein the engagement portion of the or each rotary securing element is operable, in the second rotational orientation, to cause the first and second portions to engage with one or more of the walls of the respective channel.

7. A track guide according to claim 1, wherein the engagement portion of the or each rotary securing element has a cam profile having rotational symmetry of the order of one or two.

8. A track guide according to claim 1, wherein the engagement portion of the or each rotary securing element has an elliptical cam profile.

9. A track guide according to claim 1, wherein the engagement portion of the or each rotary securing element has a circular cam profile having a centre offset from the axis of rotation of the respective rotary securing element.

10. A track guide according to claim 1, wherein the or each rotary securing element is located in a respective recess formed in the elongate main body.

11. A track guide according to claim 1, wherein a plurality of rotary securing elements are provided on each track connector.

12. A track connector for connection of first and second sections of a track guide for a cutting saw power tool, the track guide being arranged in use to engage with a cutting saw power tool such that the cutting saw power tool is operable to slide back and forth in a longitudinal direction along the track guide, the first and second track sections each having at least one longitudinal channel arranged substantially parallel to the longitudinal direction, wherein the track connector comprises: an elongate main body configured and arranged such that, in use, a first portion of the elongate main body is received within a longitudinal channel of the first track section and a second portion of the elongate main body is received within a corresponding longitudinal channel of the second track section in order to connect the first and second track sections in a longitudinal direction; and at least one rotary securing element comprising an engagement portion having a cam profile, the or each rotary securing element being selectively moveable between a first rotational orientation in which, in use, the track connector is free to move with respect to the respective longitudinal channel and a second rotational orientation in which, in use, the track connector is releasably engaged with a sidewall of a respective channel such that the track connector is held within the

respective channel.
13. A track connector according to claim 12, wherein the first and second rotational orientations are angularly spaced by 90 degrees or less.
14. A track connector according to claim 12, wherein the engagement portion of the or each rotary securing element is spaced from one or more walls of the respective channel in the first rotational orientation.
15. A track connector according to claim 12, wherein the engagement portion of the or each rotary securing element is configured and arranged to engage directly with one or more of the walls of the respective channel in the second rotational orientation.
16. A track connector according to claim 15, wherein the engagement portion of the or each rotary securing element is configured and arranged to engage directly with two opposing walls of the respective channel in the second rotational orientation.
17. A track connector according to claim 12, wherein the elongate main body comprises first and second portions, and wherein the engagement portion of the or each rotary securing element is operable, in the second rotational orientation, to cause the first and second portions to engage with one or more of the walls of the respective channel.
18. A track connector according to claim 12, wherein the engagement portion of the or each rotary securing element has a cam profile having rotational symmetry of the order of one or two.
19. A track connector according to claim 12, wherein the engagement portion of the or each rotary securing element has an elliptical cam profile.
20. A track connector according to claim 12, wherein the engagement portion of the or each rotary securing element has a circular cam profile having a centre offset from the axis of rotation of the respective rotary securing element.
21. A track connector according to claim 12, wherein the or each rotary securing element is located in a respective recess formed in the elongate main body.
22. A track connector according to claim 12, wherein a plurality of rotary securing elements are provided on each track connector.