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(54) **CHANNEL SYSTEM AND METHOD OF CONSTRUCTING SAME**

(57) A channel system (1) is provided for drainage of water, comprising a channel (10), a plurality of grating components (14, 16) for fitting to the channel to form an enclosed channel system, the grating components (14, 16) comprising a first grating (14) and a second grating (16). The first grating (14) is moveable between an unlocked position in which it is removable from the channel (10) and a locked position in which it is retained by the channel (10). Positioning of the second grating (16) on the channel (10) retains the first grating (14) in the locked position. A method of constructing such a channel system is also disclosed.

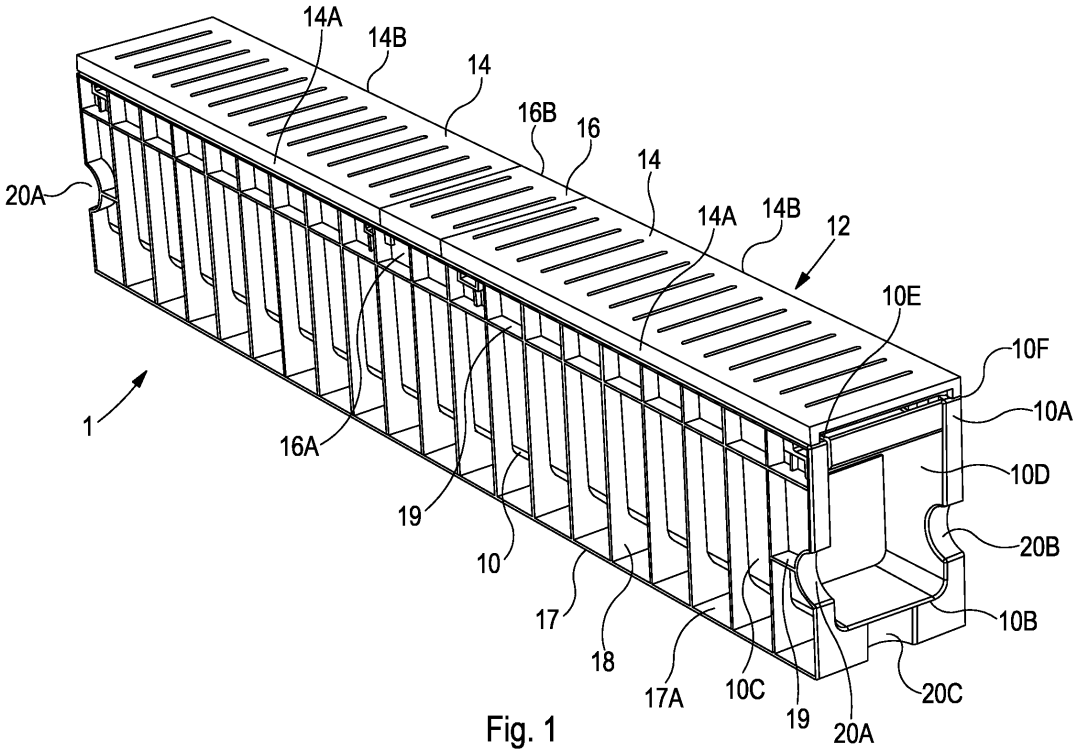


Fig. 1

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## Description

### Field of the Invention

**[0001]** This invention relates to a channel system. Particularly, but not exclusively, the invention relates to a linear channel for water drainage and treatment.

### Background to the Invention

**[0002]** Linear channels for drainage are well-known. Linear channels generally comprise an enclosed channel, typically with a U-shaped cross section and a grating over the top. The grating allows water to enter the channel, prevents objects from entering the channel and also allows them to be traversed safely, e.g. by people or vehicles. These channels drain along their entire length, rather than at one particular point, as a gully does, and are particularly utilised for collecting rainwater.

**[0003]** Linear channels come in a variety of materials, shapes and sizes and have the benefit of requiring relatively shallow excavation.

**[0004]** For safety, the grating must be fixed to the channel in some manner. Speed and ease of installation are important considerations in carrying out the installation of linear channels. The ease of removing the grating once it has been fixed to the channel in order to carry out maintenance on the channels is also of importance.

**[0005]** Linear channels may contain means to remove contaminates from the collected water before the water passes through channel outlets. The channels may need to be cleaned due to a build-up of contaminates which means that being able to get access to the channels by removing the gratings in an efficient and simple way is of great benefit.

**[0006]** The present invention has therefore been devised with the foregoing in mind. The invention seeks to overcome or ameliorate at least one of the disadvantages of the prior art, or provide a useful alternative.

### Summary of the Invention

**[0007]** According to a first aspect of the present invention there is provided a channel system for drainage of water, comprising a channel and a plurality of grating components for fitting to the channel to form an enclosed channel system. The grating components comprise a first grating and a second grating. The first grating is moveable between an unlocked position in which it is removable from the channel and a locked position in which it is retained by the channel. The positioning of the second grating on the channel retains the first grating in the locked position. This has the advantage that the grating components can be quickly and easily installed on, and removed from, the channel, e.g. in order to carry out maintenance etc. In addition, the ease and speed of removing the gratings means access to the channels (e.g. to clean them) can be achieved efficiently and using minimal tools. Further, the second grating holds the first grating located in place which reduces the requirement for additional locking means.

**[0008]** Slidable connecting means may be provided for connecting the first grating to the channel. This is a simple and quick way to move the first grating into a locked position.

**[0009]** The second grating may have a locking means for fixing the second grating in position on the channel. This stops easy or unauthorised removal of the second grating which in turn stops easy or unauthorised removal of the first grating. This improves safety of the channel system.

**[0010]** The locking means may be rotatable.

**[0011]** The channel system may comprise two first gratings, each being retained in the locked position by positioning of the second grating on the channel.

**[0012]** The second grating may be located between the first gratings. This has the advantage that the second grating can lock two first gratings in place.

**[0013]** The locking means may lock the second grating to the first gratings. This has the advantage that the second grating does not need to be locked to the channel itself but can be held in place by being locked to the first gratings.

**[0014]** The locking means may be located on a channel face of the second grating and may comprise a rotatable pin and a bar, the bar having a length greater than the longitudinal length of the second grating. This provides an effective and simple way of locking the second grating to the first gratings.

**[0015]** The first gratings may each comprise a locking seat configured to accommodate the bar.

**[0016]** The locking seat may comprise an angled portion extending away from the channel face of the first grating and a groove to lock the bar in position. This means that the bar must be actively moved and deflected in order to arrive at the locking position in the groove and similarly moved and deflected from the groove to unlock the second grating. Therefore, unintentional locking and unlocking is avoided.

**[0017]** The angled portion may be a first angled portion, and the locking seat may further comprise a second angled portion extending away from the channel face of the first grating on an opposing side to the first angled portion with respect to the groove.

**[0018]** The slidable connecting means may comprise extending elements at longitudinal ends of the first gratings and corresponding slots and recesses in the channel.

**[0019]** The grating components may comprise two longitudinally extending edges which abut longitudinally extending edges of the channel.

**[0020]** The extending elements of the first channel may be configured to be held in the channel recesses by shoulders of the longitudinally extending edges of the channel.

**[0021]** The channel may be U-shaped.

**[0022]** The channel may comprise a baffle system for removing contaminates from the water before the water leaves the channel system. This has the advantage that the water is cleaned before exiting the channel system. The baffle system slows the flow velocity of the water and impedes particle movement which allows solids to settle to the bottom of the channel.

**[0023]** The baffle system may comprise at least a baffle near a longitudinal end of channel.

**[0024]** The baffle may comprise a first barrier at a lower portion of the channel and extending towards an upper portion of the channel.

**[0025]** The baffle may further comprise a second barrier adjacent to the first barrier, the first barrier being nearer the longitudinal end than the second barrier.

**[0026]** The second barrier may have a hole near the lower portion of the channel. This allows water to flow through the second barrier which forces the particles in the water to the lower portion of the channel.

**[0027]** The second barrier may extend further from the lower portion of the channel than the first barrier. This has the advantage that the water will flow over the first barrier which makes it more difficult for particles to continue flowing with the water, especially if they have been forced to the lower portion of the channel by the second barrier.

**[0028]** The channel system may further comprise a filter located between the baffle and the upper portion of the channel for preventing water bypassing the baffle system. The filter cleans the water, e.g. by coalescing particles in the water into larger globules which float upwards in the water.

**[0029]** The second barrier may abut the filter. This has the advantage that little or no water can bypass the second barrier after passing through the filter.

**[0030]** The baffle may be moulded to the channel.

**[0031]** The baffle may be a first baffle and the baffle system may comprise a second baffle near the other longitudinal end of the channel. This means that water can be cleaned before exiting either end of the channel.

**[0032]** The filter may be a first filter and the channel system may further comprise a second filter corresponding to the second baffle.

**[0033]** The channel may comprise at least one hole at a longitudinal end of the channel. This allows water to exit the channel.

**[0034]** The channel may connect to an adjacent channel, to form an extended channel. This has the advantage that a larger area can be drained by using more than one channel. The hole in the channel combined with a hole in the adjacent channel may form an outlet hole in the extended channel.

**[0035]** The outlet hole of the extended channel may be located adjacent to and between baffles of the channels. This has the advantage that water must pass through at least one of the baffles before exiting the channel system.

**[0036]** The extended channel may comprise two filters abutting each other. This has the advantage that water must pass through at least one of the filters before exiting the channel system.

**[0037]** The outlet hole may be located in the lower portion of the channel or a wall extending between the lower and upper portions of the channel.

**[0038]** The extended channel may further comprise a second outlet hole.

**[0039]** According to a second aspect of the present invention there is provided a method of constructing a channel system, comprising: fitting a first grating to a channel, moving the first grating to a locked position in which it is retained by the channel, and positioning the second grating on the channel to retain the first grating in a locked position. This has the advantage that the first and second gratings can be quickly and easily fitted to the channel in an efficient manner and using minimal tools.

**[0040]** The method may further comprise: slidably connecting two first gratings to the channel, locating the second grating between the first gratings, and locking the second grating to the first gratings using a rotatable locking means.

**[0041]** The method may further comprise: rotating a pin of the rotatable locking means located on the channel side of the second grating such that a bar is rotated, the bar having a length greater than the longitudinal length of the second grating, and locating the bar in a groove in a seat on the first grating.

**[0042]** The method may further comprise: slidably connecting the two first gratings to the channel by inserting extending elements of the first gratings into slots in the channel; and sliding the first gratings towards the longitudinal ends of the channel and into recesses in the channel.

**[0043]** According to a third aspect of the present invention there is provided a method of draining cleaned water from a channel system, comprising: draining water through a grating into a channel; passing water through a coalescing filter in the channel; passing water through a baffle in the channel, the baffle comprising a first barrier and a second barrier; wherein the water is passed over the first barrier after having being passed through a hole in the second barrier; and passing the cleaned water through an outlet hole formed by adjacent holes in two channels located adjacently, the outlet hole being located between a baffle from each channel. This has the advantage that water can be cleaned before exiting a channel system.

**[0044]** According to a fourth aspect of the invention, there is provided a kit of parts for a channel system, comprising a channel, a plurality of grating components for fitting to the channel to form an enclosed channel system, the grating components comprising a first grating and a second grating, wherein the first grating is configured to be movable from an unlocked position in which it is removable from the channel to a locked position in which it is retained by the channel, and wherein the second grating is configured to be positioned on the channel such

that the first grating is not moveable to the unlocked position.

## Brief Description of the invention

**[0045]** An embodiment of the invention will now be described, by way of example only, with reference to the accompanying drawings in which:

Figure 1 shows a perspective view of a linear channel in accordance with an embodiment of the present invention;

Figure 2 shows a plan view of the linear channel with gratings in fixed position of the embodiment of Figure 1;

Figure 3 shows a perspective view of the linear channel with central grating removed of the embodiment of Figure 1;

Figure 4 shows a detailed perspective view of a longitudinal end of the linear channel of the embodiment of Figure 1;

Figure 5 shows a detailed perspective view of the central grating and locking means of the linear channel of the embodiment of Figure 1;

Figure 6 shows a detailed underside view of the central grating and locking means of the linear channel of the embodiment of Figure 1;

Figure 7 shows a cut away view of a longitudinal end of the linear channel of the embodiment of Figure 1;

Figure 8 shows a side view of a longitudinal end of two linear channels of the embodiment of Figure 1.

Figure 9 shows a perspective view of an extended channel formed of two linear channels of the embodiment of Figure 1.

Figure 10 shows a perspective view of filters in an extended channel formed of two linear channels of the embodiment of Figure 1.

Figure 11 shows a perspective view of a filter for use in the linear channel of the embodiment of Figure 1.

Figure 12 shows a perspective view of main gratings in an unlocked position of the linear channel of the embodiment of Figure 1.

## Description of the embodiments of the invention

**[0046]** With reference to Figure 1, there is provided a channel system 1 comprising a channel 10, and a grating 12. Figure 2 shows a plan view of the grating 12. The grating 12 comprises two first or main gratings 14 and a smaller second or central grating 16. The channel 10 is substantially U-shaped with the open end of the channel 10 at an upper portion 10A and water being collected in a lower portion 10B. The channel 10 has walls (a first wall 10C and a second wall 10D) extending from the lower portion 10B to the upper portion 10A of the channel 10. The channel 10 has a longitudinal length greater than its transverse width. The longitudinal ends of the channel 10 are open which allows additional channels 10 to be connected adjacently to make a longer extended channel. This will be described in more detail later.

**[0047]** A base 17 is provided to support the channel 10. The base 17 comprises a rectangular first base section 17A orientated horizontally below the channel 10 and a rectangular second base section 17B which is orientated vertically and connects the first base section 17A and the channel 10. The first base section 17A and second base section 17B extend along the full longitudinal length of the channel 10. The base 17 further comprises base ribs 18 which extend laterally outwards from the second base section 17B and around the outer surface of the channel 10 to end at the upper portion 10A of the channel 10. On the outer surface of the channel 10 there are ribs 19 which extend longitudinally along, and laterally from, the first and second walls 10C, 10D of the channel to provide structural rigidity to the channel system 1. In the first wall 10C there are semi-circular first holes 20A formed at each longitudinal end of the channel 10. Similarly second holes 20B are formed in the second wall 10D and third holes 20C are formed in the base section 17 at the lower portion 10B at each longitudinal end of the channel 10. The third holes 20C are blind, i.e. they do not extend through the lower portion 10B of the channel 10, so that the lower inner surface of the channel 10 is not perforated. However, if an outlet in the bottom of the channel 10 is required this can be easily achieved using suitable tooling to make the third hole 20C fully penetrate through the lower surface of the channel. The first holes 20A and the second holes 20B, allow water to drain from the channel system 1 after being collected and will be discussed in more detail later. In other embodiments, the third holes 20C can also be used to drain water if the surface of the channel 10 is perforated.

**[0048]** The grating 12 is rectangular and sits on the upper portion 10A of the channel 10. The main gratings 14, and the central grating 16, each have two longitudinal edges 14A, 14B, 16A, 16B, which rest on upward facing longitudinal edges 10E, 10F, on transversely opposing sides of the upper portion 10A of the channel 10. The two main gratings 14 are situated at opposite longitudinal ends of the channel 10 with the central grating 16 located inbetween. The grating 12 has substantially the same total longitudinal length as the longitudinal length of the channel 10. That is, the combined longitudinal length of the two main gratings 14 and the central grating 12 is substantially equal to the longitudinal length of the chan-

nel 10. Also, the transverse width of the grating 12 and the transverse width channel 10 are substantially the same.

**[0049]** Figure 3 shows the channel system 1 with the central grating 16 removed from the channel 10. Provided on a channel face 14C of the main gratings 14, i.e. the face that is offered up to the channel 10, are extending elements 22, 23, for fixing the main gratings 14 to the channel 10. Each longitudinal end of the main gratings 14 has extending elements 22, 23. Figure 4 shows one of the longitudinal ends of the channel system 1 in more detail. The extending elements 22, 23, comprise upper portions 22A, 23A, which protrude downwards from the channel face 14C of the main gratings 14 and lower portions 22B, 23B, that protrude transversely outwardly into recesses 24, 25, in the first and second walls 10C, 10D, of the channel 10. Slots 26 (not shown), 27, are formed in the first and second walls 10C, 10D and extend downwards from the longitudinal edges 14A, 14B, of the channel 10 to the same distance as the bottom of the recesses 24, 25. Upper portions of the recesses 24, 25, are formed by shoulders 10G, 10H, of the longitudinal edges 10E, 10F, of the channel 10. There are recesses 24, 25, in the channel 10 at positions corresponding to each of the extending elements 22, 23, of the main gratings 14.

**[0050]** Figure 5 shows a detailed perspective view of the central grating 16 in position between the main gratings 14 and Figure 6 shows an underside view of the central grating 16. The central grating 16 has a locking mechanism 28 for locking the central grating 16 to both the main gratings 14. The locking mechanism 28 comprises a rotatable locking pin 30 positioned in a housing 32 orientated downwards from a channel face 16C of the central grating 16, i.e. the face that is offered up to the channel 10. In this embodiment, the pin 30 is cylindrical but in other embodiments the pin 30 may be a different shape. The locking mechanism 28 further comprises a cylindrical bar 34 which is connected at its axial centre to the pin 30 and is orientated perpendicularly to the orientation of the pin 30, i.e. horizontally. In other embodiments, the bar 34 may be other suitable shapes, e.g. having a rectangular or oval cross section. The bar 34 of the locking mechanism 28 rotates in a plane substantially parallel to the central grating 16. Due to the pin 30 being rotatable 360 degrees around its axis, the bar 34 can also rotate around 360 degrees. The axial length of the bar 34 is greater than the longitudinal length of the central grating 16 but less than the transverse width of the central grating 16. In addition, the pin 30 is located centrally in the central grating 16. This means that, when the central grating 16 is located on the channel 10, the bar 34 can rotate about its axial centre without impacting the first and second walls 10C, 10D, of the channel 10.

**[0051]** The main gratings 14 each comprise a locking seat 36 extending downwards from the channel face 14C of each main grating 14 at the longitudinal end of the main gratings 14 nearest the central grating 16 to accommodate the bar 34. The locking seats 36 comprise angled portions 36A extending away from the channel face 14C of the main gratings 14. There is provided a groove 36B in the seat 36 which extends towards the channel face 16C of the central grating 16, and is located between the angled portions 36A. The function of the bar 34 and the seat 36 is described below.

**[0052]** With reference to Figure 7, there is shown a baffle 38 comprising a first barrier 40 and an adjacent second barrier 42. The baffle 38 is located near a longitudinal end of the channel 10 with the first barrier 40 closer to the longitudinal end of the channel 10 than the second barrier 42. The barriers 40, 42, are substantially rectangular, orientated vertically, and span the full width of the channel 10 between the first and second walls 10C, 10D, of the channel 10. The barriers 40, 42, are formed around the full inner surface of the lower portion 10B of the channel 10 and extend upwards towards the upper portion 10A. The second barrier 42 has a barrier hole 44 located approximately halfway across the width of the second barrier 42 and extending upwards from the lower portion 10B of the channel 10. The second barrier 42 is longer than the first barrier 40, i.e. extends further from the lower portion 10B of the channel 10. The barriers 40, 42, are moulded to the channel 10 to ensure the baffle 38 is leak tight and no water can pass around the sides of the barriers 40, 42. There is an identical baffle 38 located at the other longitudinal end of the channel 10.

**[0053]** Referring to Figure 8, two linear channels 10 are shown adjacent to each other, with the longitudinal end of one of the channels 10 abutting the longitudinal end of the other channel 10. This forms an extended channel 46. Figure 9 is a side view of the channels 10 just before they are brought together and show the semi-circular first holes 20A in the first walls 10C of the channels 10 adjacent to each other. Also, the second base section 17B forming the semi-circular third holes 20C are shown adjacent to each other. Referring once more to Figure 8, it is shown that when the channels 10 abut each other the semi-circular first holes 20A in first walls 10C form a circular first outlet hole 48 and the semi-circular second holes 20B in second walls 10D form a circular second outlet hole 49. The semi-circular third holes 20C form a similar third outlet hole 50 that is not shown here. However, the third outlet hole 50 does not protrude through the lower surface of the channel 10 because, as mentioned above, the semi-circular third holes 20C do not fully penetrate the channel 10. The first and second outlet holes 48, 49, extend horizontally, i.e. water drains out of the first and second outlet holes 48, 49, in a horizontal direction. The third outlet hole 50 extends vertically and, in embodiments where the surface of the channel 10 is perforated, water drains out of the third outlet hole 50 in a vertical direction. The outlet holes 48, 49, 50, are all located adjacent to and between the respective baffles 38 of each channel 10.

**[0054]** Referring to Figure 10, the extended channel 46 is shown with two filters 52 located above the baffles 38 and the outlet holes 48, 49, 50. The filters 52 are co-

alescing filters. The two filters 52 butt up against each other when the channels 10 are adjacent to prevent water from bypassing the baffles 38. The filter 52 is shown in more detail in Figure 11 and has a box section 54 with a first box wall 54A and a second box wall 54B, for abutting the first and second walls 10C, 10D of the channel 10, and a third box wall 54C for abutting a third box wall 54C of another filter 52. From the box section 54, there is a downwardly extending portion 56 which extends across the full width of the channel and extends down to abut the top of the second barrier 42 to stop water from bypassing the baffle 38. A filter section 58 extends downwards at an angle from the box section 54 of the filter 52 and has a filter grating 59 partway down the filter section 58 to filter contaminates in the water that have passed the grating 12. The filter section 58 of the filter 52 extends all the way to the lower surface of the channel 10.

**[0055]** The method of fixing the grating 12 to the channel 10 will now be described. Figure 12 shows the longitudinal edges 14A, 14B of the main gratings 14 located on the longitudinal edges 10E and 10F of the channel 10, such that the main gratings 14 are in an unlocked position. Referring to Figure 4, the main gratings 14 are placed onto the channel 10 by inserting the extending elements 23 into the slots 26, 27, until the longitudinal edges 14A, 14B, of the main gratings 14 come into contact with the longitudinal edges 10E, 10F, of the channel 10. The main gratings 14 are then moved away from the longitudinal centre of the channel 10 towards the corresponding longitudinal ends of the channel 10, i.e. into a locked position - see Figure 3. This is achieved by sliding the extending elements 22, 23, into the recesses 24, 25, until the lower portions 22B, 23B, abut the walls of the recesses 24, 25, nearest the longitudinal ends of the channel 10 and the longitudinal ends of the main gratings 14 line up with the longitudinal ends of the channel 10. The shoulders 10G, 10H, of the longitudinal edges 10E, 10F, are located above the lower portions 22B, 23B, of the extending elements 22, 23, and restrict movement of the extending elements 22, 23, and thus the main gratings 14, in an upwards direction. Therefore, the movement of the main gratings 14 is restricted and the main gratings 14 are partially fixed in position, i.e. in the locked position, they cannot move horizontally towards the closest longitudinal end of the channels 10 or vertically.

**[0056]** To lock the main gratings 14 to the channel 10, movement towards the longitudinal centre of the channel 10 (the unlocked position) must be stopped. Referring to Figure 3, which shows the two main gratings 14 in their locked position, longitudinal movement of the main gratings 14 is restricted by inserting the central grating 16 between the two main gratings 14. To allow the central grating 16 to be inserted between the main gratings 14 the bar 34 of the locking mechanism 28 must be angled away from having its axis orientated in the longitudinal direction of the channel 10 to the extent that the ends of the bar 34 must not extend further than the longitudinal ends of the central grating 16. This is because the bar 34 has a greater axial length than the longitudinal length of the central grating 16. Once the central grating 16 is in position between the main gratings 14, the locking mechanism 28 can be used to lock the central grating 16 to the main gratings 14 and stop the central grating 16 from being removed from the channel 10.

**[0057]** To lock the central grating 16, the pin 30 is rotated in the housing 32 which in turn rotates the bar 34. The pin 30 is rotated using a screwdriver or a specific tool designed for this purpose. The bar 34 is rotated to have its axis orientated in the longitudinal direction of the channel 10. As the bar 34 is rotated to this point, each axial end of the bar 34 comes into contact with one of the angled portions 36A of the seats 36. The direction the bar 34 is rotated will determine which of the angled portions 36A the bar 34 will impact. This contact will cause some resistance to the turning motion and as this is overcome, the bar 34 will slide along the angled portions 36A until each axial end of the bar 34 enters the grooves 36B. Once the axial ends of the bar 34 are in the grooves 36B, the bar 34 will not move unless rotated with sufficient force to move it out of the grooves 36B. This will only occur if the pin 30 is rotated. The retaining tension of the bar 34 to keep it held within the grooves 36B is provided by the bar 34 material elasticity. The bar 34 is able to deflect enough to go over the angled portions 36A before settling into the grooves 36B of the seats 36. Once the bar 34 is located in the grooves 36B of the seats 36, the central grating 16 will thus be locked to the main gratings 14. Therefore, because the main gratings 14 cannot move to an unlocked position with the central grating 16 in place on the channel 10, the grating 12 will be fixed to the channel 10 and will not be able to be removed without unlocking the locking mechanism 28.

**[0058]** To remove the grating 12 the locking mechanism 28 must be unlocked. To unlock the locking mechanism 28, the pin 30 is rotated such that the axial ends of the bar 34 leave the grooves 36B, and further rotated such that bar 34 is in a position where the axial ends of the bar 34 do not extend further than the longitudinal ends of the central grating 16. The central grating 16 and then the main gratings 14 can then be removed in an opposite way to that described above for fixing the grating 12 to the channel 10 because the bar 34 will not impact the lower surfaces of the main gratings 14.

**[0059]** Referring to Figure 1, the channel system 1 with the grating 12 in position allows water to be drained through the grating 12 and collected in the channel 10. The grating 12 stops large objects, such as leaves or rubbish, from entering and clogging up the channel 10. The grating 12 also allows the channel system 1 to be traversed safely, e.g. by people or vehicles. Referring to Figures 8 and 10, when the channels 10 are connected adjacently, the water can be drained to the outlets 48, 49. In other embodiments, the water can be additionally, or alternatively, drained to outlet 50. Any number of channels 10 can be located adjacently to make a channel system 1 of any length required. The location of the filters

52 between the main gratings 14 and the baffles 38, with the filters 52 and the baffles 38 means that nearly all of the water must pass through the baffles 38 before getting to the outlets 48, 49. The downwardly extending portions 56 of the filters 52 abut the top of the second barriers 42 to restrict water bypassing the baffles 38 by flowing over the top of the second barriers 42. Only a small amount of water would be able to pass between the abutment fit and this would only be possible if the volume of the water in the channel 10 came up to the level of the top of the barrier 42. In this embodiment gasket seals are not provided to stop water escaping between the abutment fit as the water will be treated and will soak into the surrounding ground. In other embodiments, gasket seals may be provided. Any water entering the channel 10 through the main grating 14 above the outlets 48, 49, and the baffles 38, will collect in the box sections 54 of the filters 52 and run down the filter sections 58 and then through the filter gratings 59. Therefore, all the water must pass through the filter sections 58 of the filters 52, i.e. pass through the filter gratings 59, which coalesces particles in the water. The filters 52 allow, for example, floating oil to attach to the surfaces of the filters 52 which then forms a larger globule of oil that floats upwards in the water. Further, all the water must pass through the barrier hole 44 in the barrier 42 and then over the top of the barrier 40 before getting to the outlets 48, 49, - see Figure 7. The baffles 38 slow the flow velocity of the water, allowing solids to settle to the bottom of the channel 10, and also impede particle movement due to the particles impacting the barriers 40, 42. In this way, the water is cleaned before exiting the channel system 1.

**[0060]** It will be appreciated by persons skilled in the art that various modifications may be made to the above embodiment without departing from the scope of the present invention as defined by the claims. For example, whilst the above discussion has been concerned with water drainage, the invention is equally applicable to drainage of other types of liquid.

## Claims

**1.** A channel system for drainage of water, comprising:

a channel;
a plurality of grating components for fitting to the channel to form an enclosed channel system;
the grating components comprising a first grating and a second grating;
wherein the first grating is moveable between an unlocked position in which it is removable from the channel and a locked position in which it is retained by the channel;
wherein positioning of the second grating on the channel retains the first grating in the locked position.

**2.** The channel system according to claim 1, wherein slidable connecting means are provided for connecting the first grating to the channel.

**3.** The channel system according to any preceding claim, wherein the second grating has a locking means for fixing the second grating in position on the channel.

**4.** The channel system according to claim 3, wherein the locking means is rotatable.

**5.** The channel system according to any preceding claim, comprising two first gratings, each being retained in the locked position by positioning of the second grating on the channel.

**6.** The channel system according to claim 5, wherein the second grating is located between the first gratings.

**7.** The channel system according to claim 6 when dependent on claim 3, wherein the locking means locks the second grating to the first gratings.

**8.** The channel system according to any of claims 3 to 7, wherein the locking means is located on a channel face of the second grating and comprises a rotatable pin and a bar, the bar having a length greater than the longitudinal length of the second grating.

**9.** The channel system according to claim 8, wherein the first gratings each comprise a locking seat configured to accommodate the bar.

**10.** The channel system according to claim 9, wherein the locking seat comprises an angled portion extending away from the channel face of the first grating and a groove to lock the bar in position.

**11.** The channel system according to claim 10, wherein the angled portion is a first angled portion, and the locking seat further comprises a second angled portion extending away from the channel face of the first grating on an opposing side to the first angled portion with respect to the groove.

**12.** The channel system according to any of claims 2 to 11, wherein the slidable connecting means comprises extending elements at longitudinal ends of the first gratings and corresponding slots and recesses in the channel.

**13.** The channel system according to any preceding claim, wherein the grating components comprise two longitudinally extending edges which abut longitudinally extending edges of the channel.

**14.** The channel system according to claim 13 when dependent on claim 12, wherein the extending elements of the first channel are configured to be held in the channel recesses by shoulders of the longitudinally extending edges of the channel.

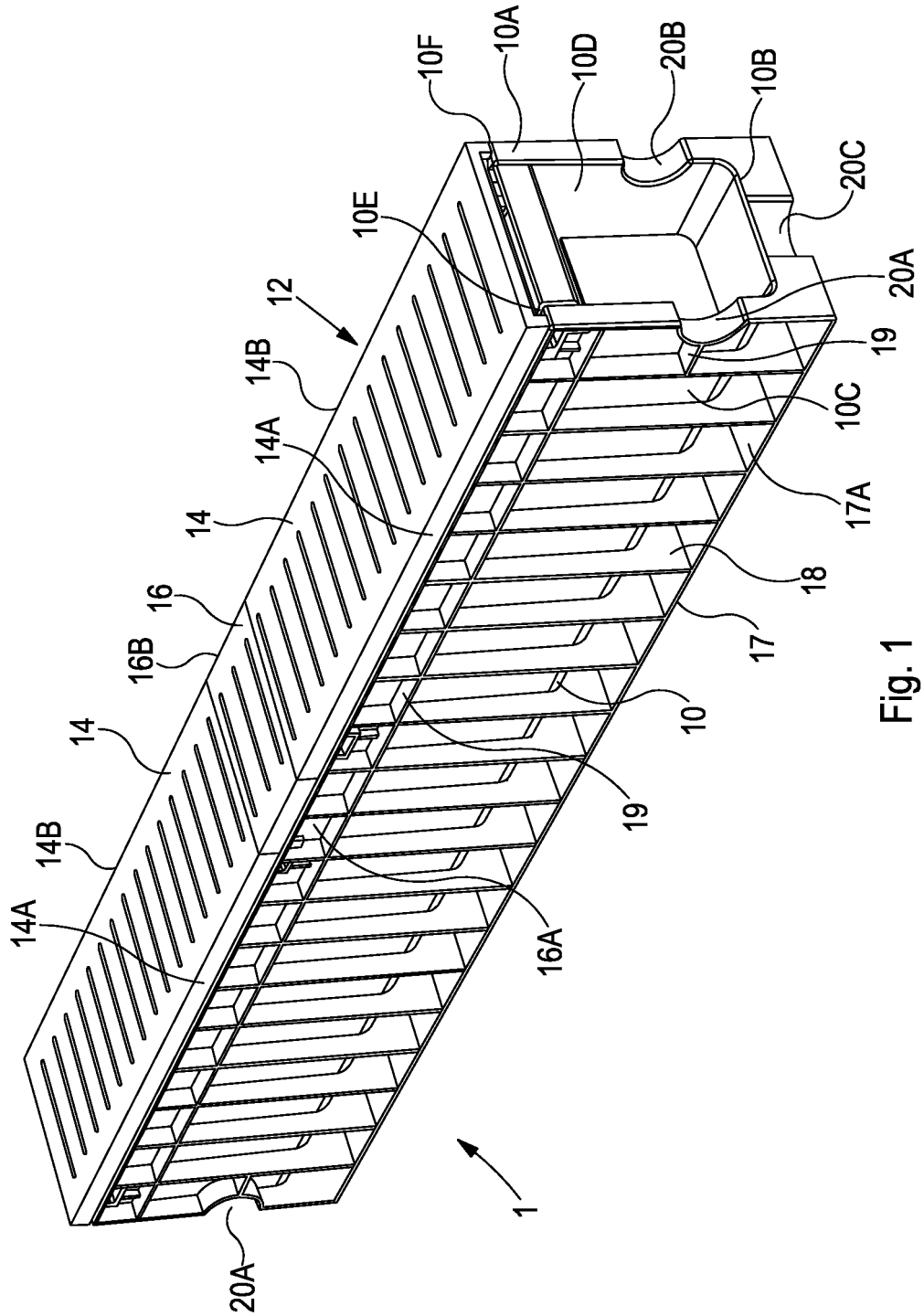
**15.** The channel system according to any of the previous claims, wherein the channel connects to an adjacent channel, to form an extended channel.

**16.** The channel system according to claim 15, wherein the channel comprises at least one hole at a longitudinal end of the channel and the hole in the channel combined with a hole in the adjacent channel forms an outlet hole in the extended channel.

**17.** A method of constructing a channel system, comprising:

fitting a first grating to a channel;
moving the first grating to a locked position in which it is retained by the channel;
positioning the second grating on the channel to retain the first grating in a locked position and optionally:

slidably connecting two first gratings to the channel;
locating the second grating between the first gratings;
locking the second grating to the first gratings using a rotatable locking means.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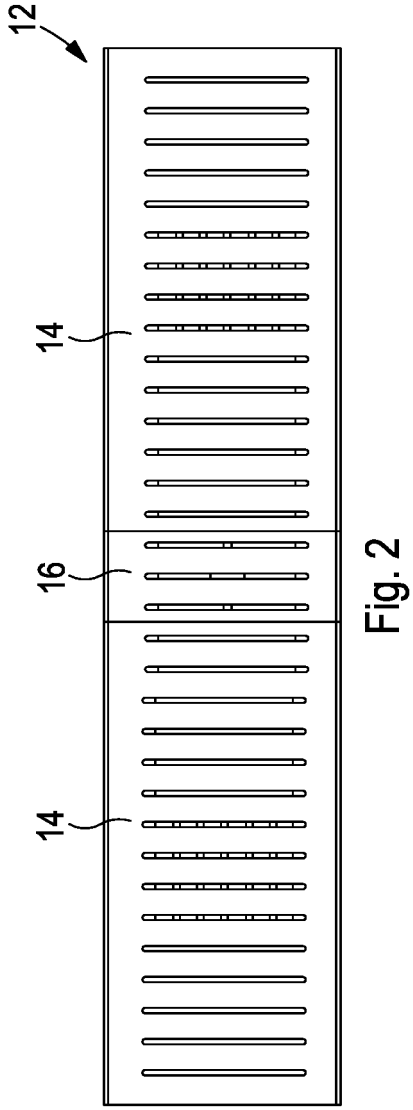
10A
10D
20B
10B
20C
10E
12
20A
14B
19
14A
10C
14
17A
16
18
16B
17
14
10
19
14B
14A
16A
1
20A

Fig. 1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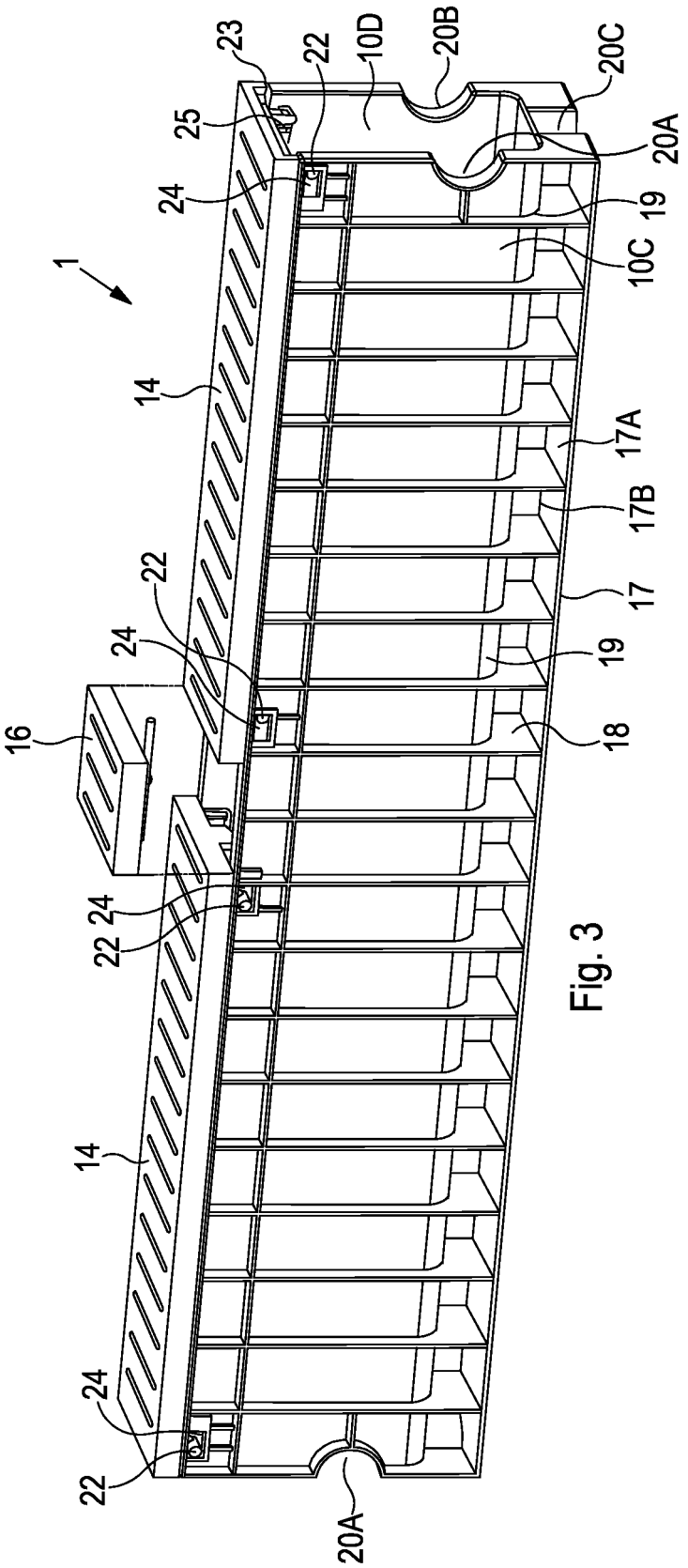
14
16
14

Fig. 2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20C
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20A
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17A
17B
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24
22
20A

Fig. 3

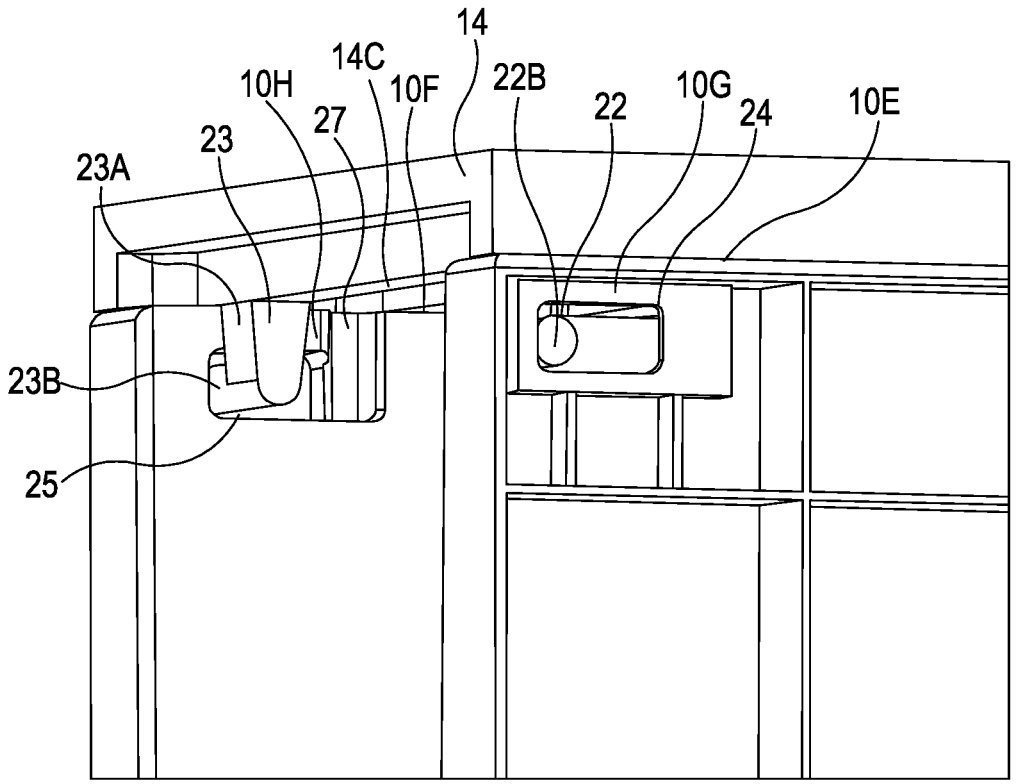



Fig. 4

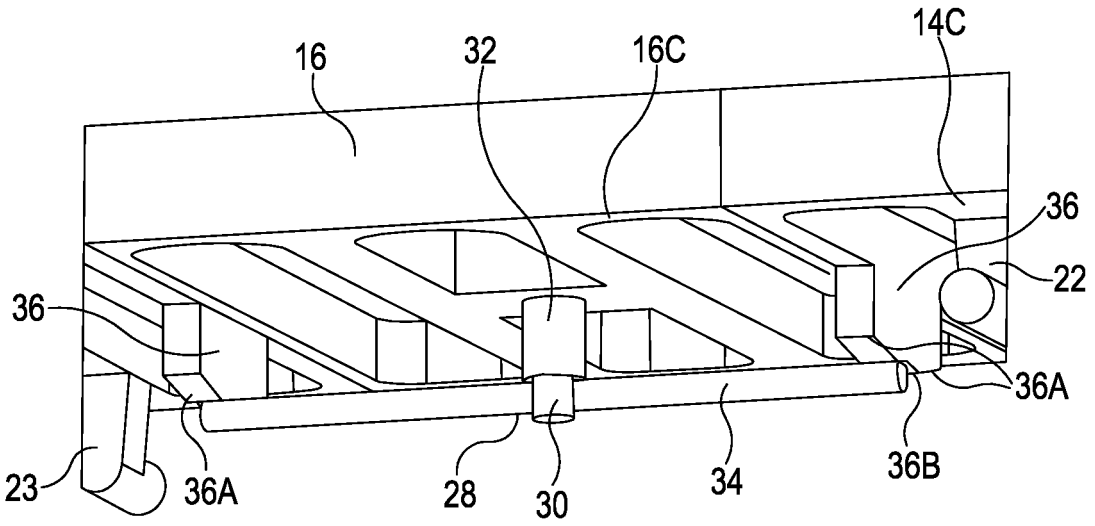



Fig. 5

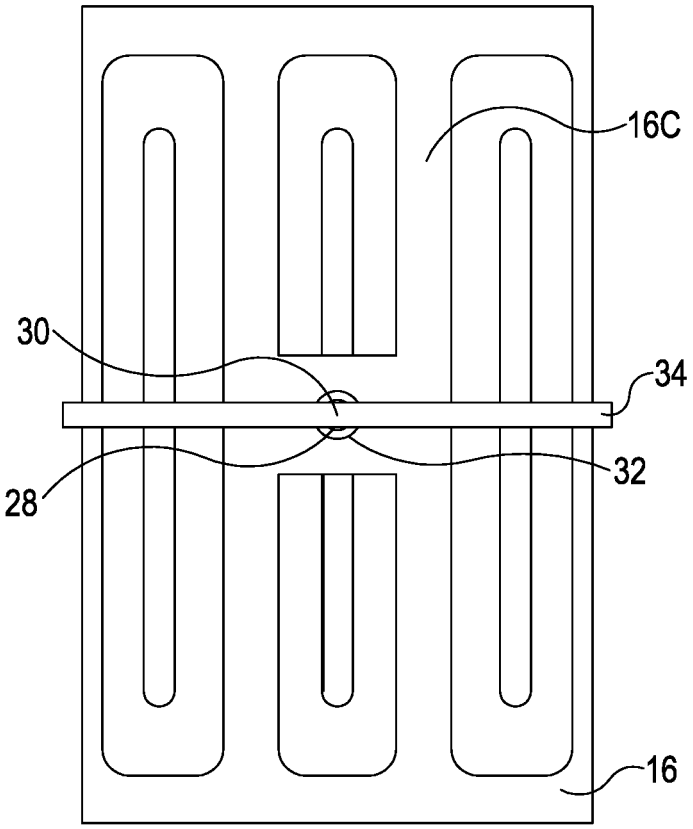



Fig. 6

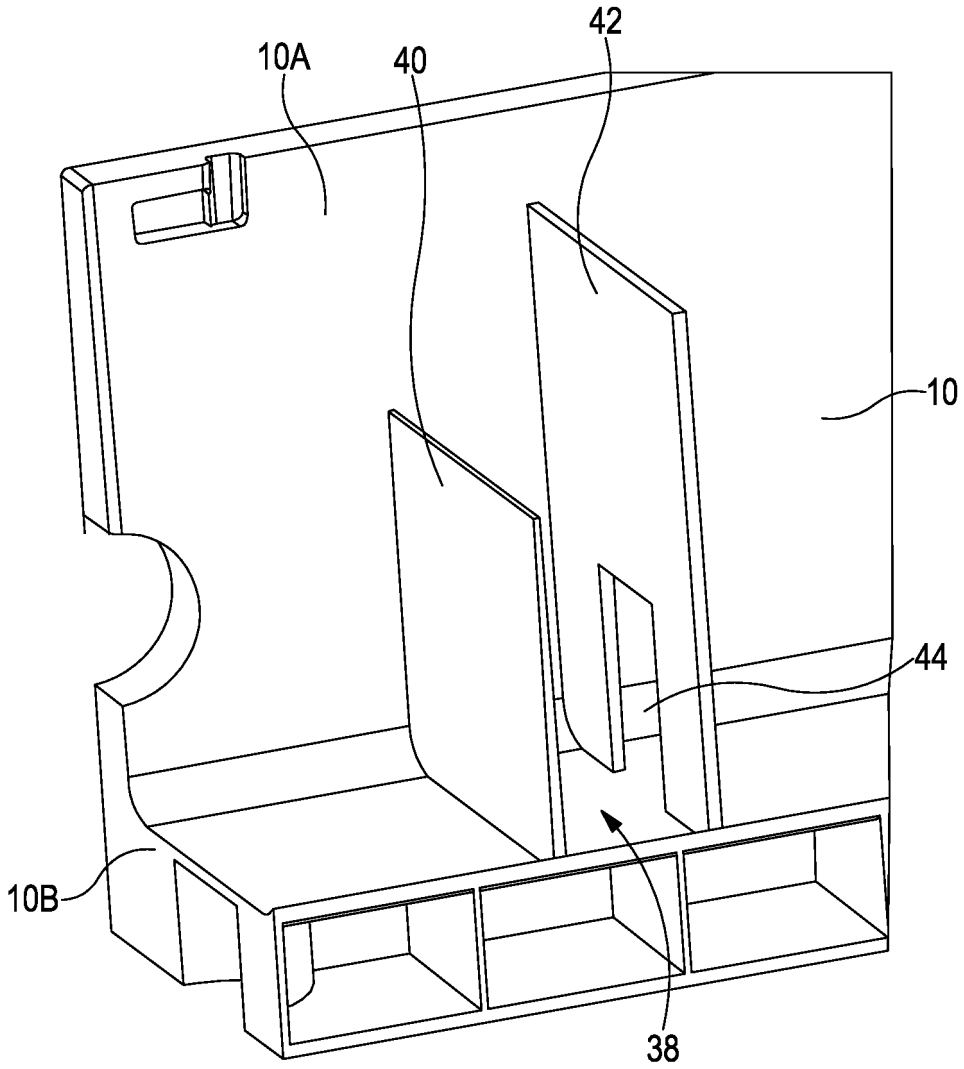
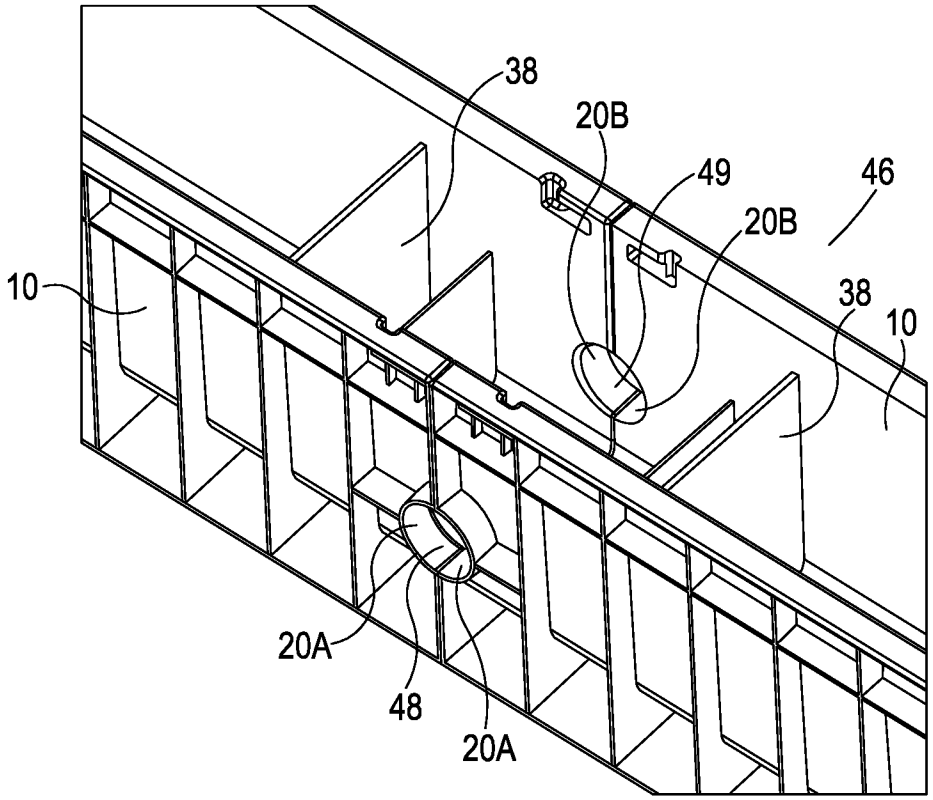



Fig. 7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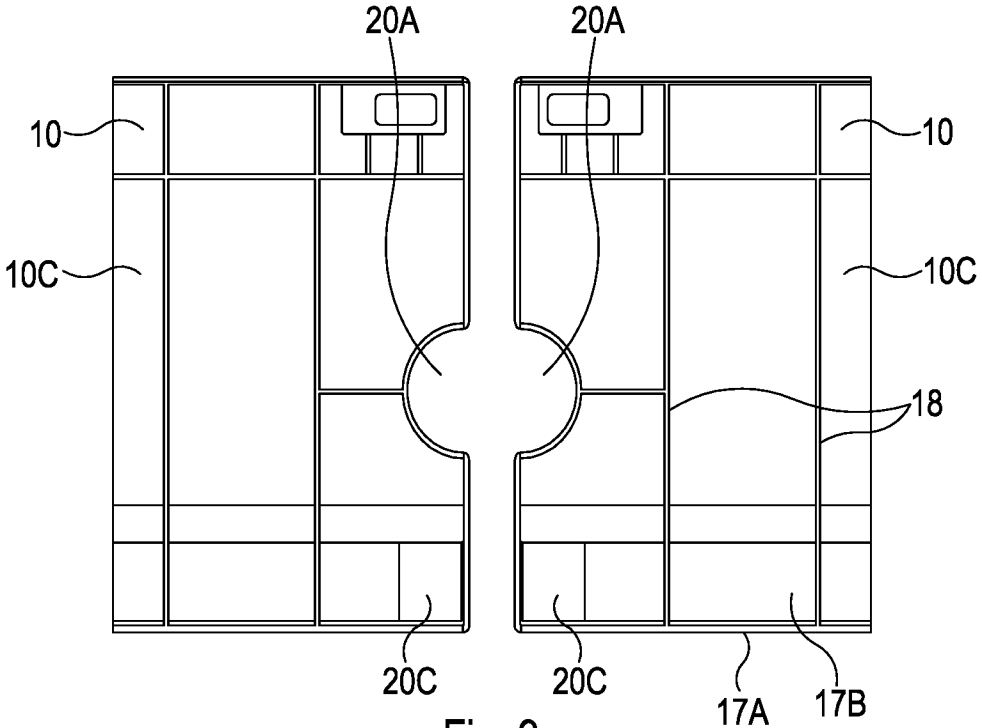
38
10
20A
48
20A

Fig. 8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10
10C
10C
18
20C
20C
17A
17B

Fig. 9

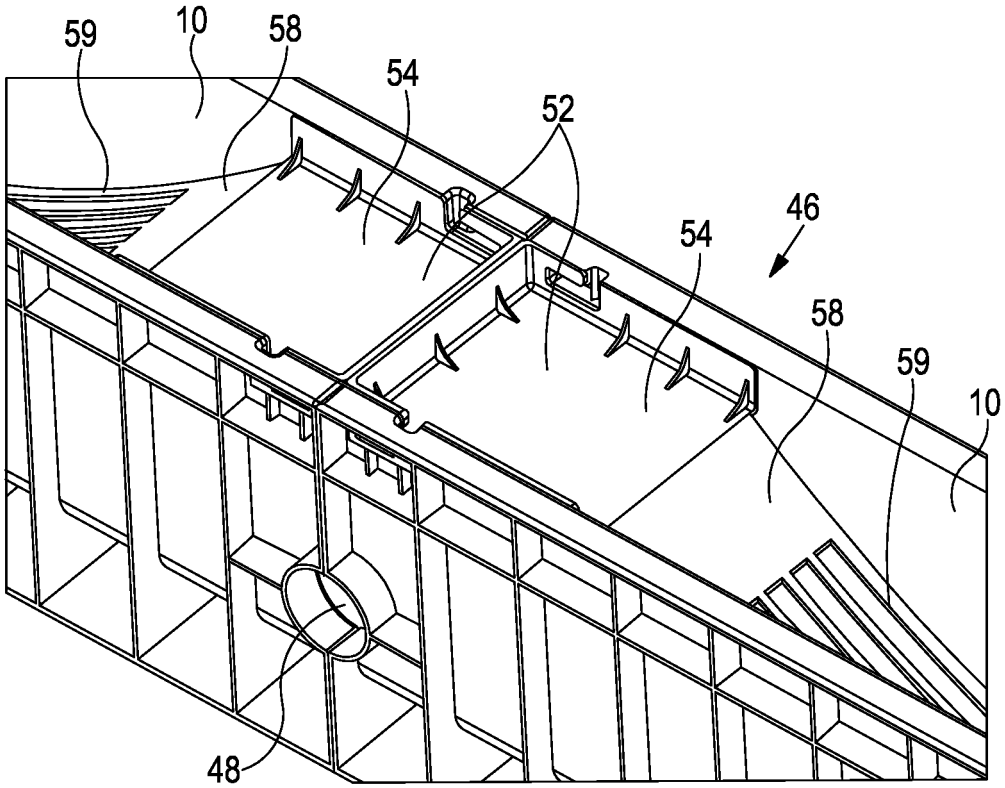


Fig. 10

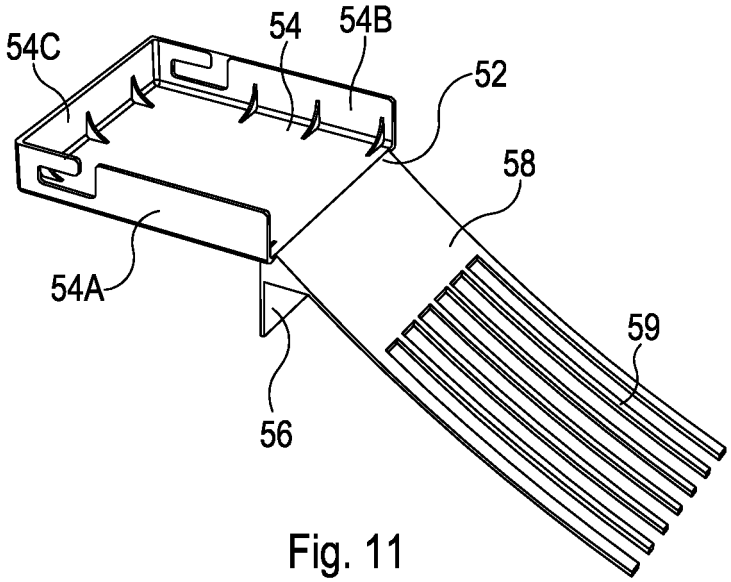


Fig. 11

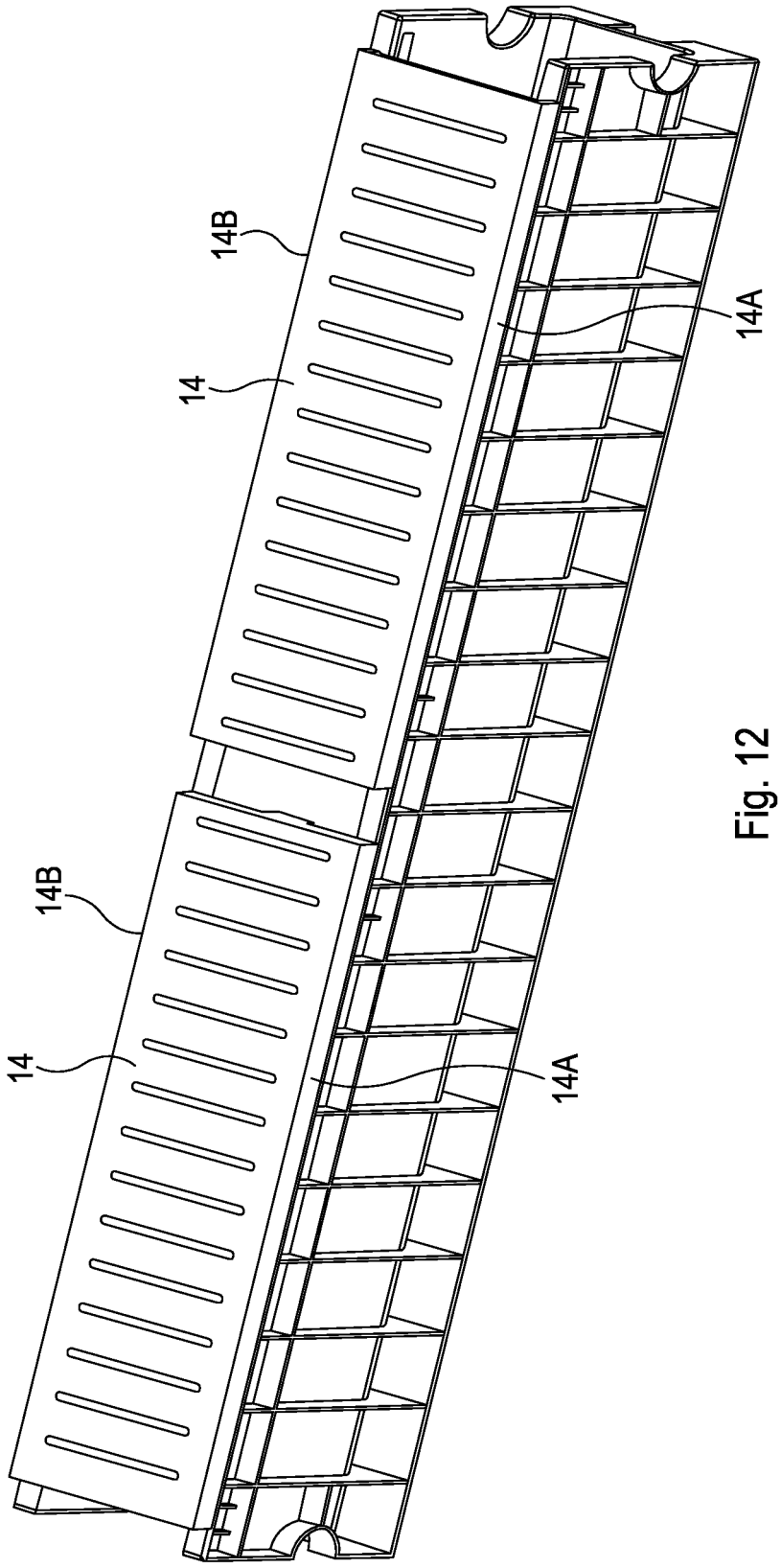


Fig. 12

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# EUROPEAN SEARCH REPORT

Application Number
EP 17 27 5050

## DOCUMENTS CONSIDERED TO BE RELEVANT

| Category | Citation of document with indication, where appropriate, of relevant passages | Relevant to claim | CLASSIFICATION OF THE APPLICATION (IPC) |
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| A | EP 2 468 969 A2 (HEINRICH MEIER EISENGIESSEREI GMBH & CO KG [DE])<br>27 June 2012 (2012-06-27)<br>* figures 1-7 *<br>* the whole document *<br>----- | 1-17 | |
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| | | | TECHNICAL FIELDS SEARCHED (IPC)<br>E03F |

The present search report has been drawn up for all claims

| Place of search | Date of completion of the search | Examiner |
|---|---|---|
| Munich | 29 September 2017 | Klein, A |

CATEGORY OF CITED DOCUMENTS

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EPO FORM 1503 03.82 (P04C01)

## ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 17 27 5050

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29-09-2017

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82