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(54) Self-propelled device and method for endways laying of railway points and track sections

(57) A self-propelled device for endways laying of railway points and track sections comprises a rigid main supporting body (4), hooking means (8) operatively associated with the main body (4) for hooking a set of points or a track section (2) under the main body (4) and movement means (9) for allowing device movement on the ground. The device (1) also comprises at least one conveyor (20) mounted above the main body (4), designed to convey ballast (3) and to unload it in front of the main body (4). The claims also relate to a method for endways laying of railway points and track sections comprising the operating steps of distributing ballast (3) on the ground to form a supporting base, endways movement on top of the ballast (3) of a self-propelled device (1) carrying the set of points or the track section (2) to be laid and laying of the set of points or the track section (2) on the ballast (3) using said device (1). Moreover, the step of distributing the ballast (3) is carried out during the step of device (1) endways movement, by means of the action of the device which distributes the ballast (3) in front of itself as it moves towards the laying position.

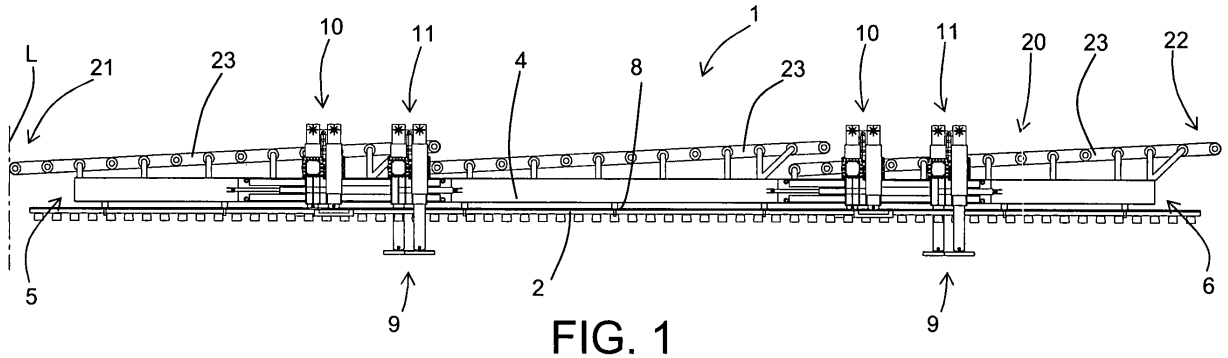

FIG. 1

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Description

[0001] The present invention relates to a self-propelled device and a method for endways laying of railway points and track sections.

[0002] In particular, the present invention is intended for use in railway line maintenance operations when a set of points or a track section need substituting, without interfering with train transit in the adjacent tracks, and minimising intervention time.

[0003] At present, substituting a set of points or a track section involves first removing the existing set of points or track section which may be done using a specific device or by disassembly.

[0004] Then a surface layer of the existing ballast is removed and substituted with the new ballast brought to the site with specific hopper railway wagons and spread by a digger to form the base on which the new set of points or the new track section will rest.

[0005] At this point, the new set of points, or the new railway track section, is laid ready-assembled, using a specific self-propelled device able to position itself directly on the laying zone by endways movement starting from the existing stretch of track.

[0006] Examples of such self-propelled devices are described in patents IT 1 186 997, US 4 608 928, US 4 784 063, US 4 249 467, US 4 566 389, US 5 619 928, US 4 773 332, FR 2 424 361 and FR 2 546 924.

[0007] However, this known method has several disadvantages.

[0008] In particular, the technology used today requires relatively long intervention times, which therefore result in lengthy interruptions of the line worked on. This is because the work has to be done without occupying the track adjacent to that worked on.

[0009] Consequently, the self-propelled device for laying the new set of points or track section may be brought to the working zone only once the formation of the ballast base is complete, that is to say, once the wagons which brought the ballast have left the same way they came.

[0010] Therefore, when the intervention zone is a long way from stations or service tracks, a great deal of time is taken even just passing from one step of the work to the next step.

[0011] Finally, it should be noticed that there are many prior art railway apparatuses able to substitute stretches of track and/or the ballast below as they move along the track.

[0012] Examples of such apparatuses are described for example in patents:

[0013] US 4 307 667, US 2001/050024, US 5 435 252, US 5 257 580, US 4 770 104, US 4 534 415, US 4 094 249, US 4 046 077, US 5 357 867, US 4 356 771, US 4 316 416, US 6 058 628, EP 1 077 288, US 5 052 132, US 5 101 584, US 5 084 989, US 4 835 887, GB 2 270 943, GB 2 097 846, US 3 872 929, EP 1 249 535, US 5 099 766, EP 0 227 142, FR 2 508 950 and GB 142 569.

[0014] In this situation, the technical purpose which forms the basis of the present invention is to provide a self-propelled device and a method for endways laying of railway points and track sections which overcomes the above-mentioned disadvantages.

[0015] In particular, the technical purpose of the present invention is to provide a self-propelled device and a method for endways laying of railway points and track sections which allow the operations for laying the ballast and the set of points/track section to be performed in a relatively simple and rapid fashion.

[0016] The present invention also has for a technical purpose to provide a self-propelled device and a method for endways laying of railway points and track sections which allow the entire substitution of a set of points or a railway track section to be performed in a simple and rapid fashion.

[0017] The technical purpose specified and the aims indicated are substantially achieved by a self-propelled device and a method for endways laying of railway points and track sections as described in the claims herein.

[0018] Other features and advantages of the invention are more apparent in the detailed description which follows, of several preferred, non-limiting embodiments of a self-propelled device and a method for endways laying of railway points and track sections, with reference to the accompanying drawings, in which:

- Figure 1 is a schematic side view of a self-propelled device made in accordance with the present invention;
- Figures 2 to 4 illustrate the device of Figure 1 in four additional operating conditions during its movement to the right with reference to the sheet on which the drawings appear;
- Figures 5 to 15 are schematic side views of the sequence of steps of laying a set of points or a railway track section in accordance with the present invention; and
- Figure 16 shows an enlarged detail, with some parts cut away to better illustrate others, of the self-propelled device of Figure 3.

[0019] With reference to the accompanying drawings, the numeral 1 denotes as a whole a self-propelled device for endways laying of railway points and track sections 2 in accordance with the present invention.

[0020] The self-propelled device 1 disclosed may be defined as "dual-purpose" because it allows both the set of points or the track section 2 and the ballast 3 below to be laid with a single operation.

[0021] For this purpose, the self-propelled device 1 comprises first a rigid main supporting body 4 extending from a first end 5 to a second end 6 along a main direction of extension which, in practice, is parallel with the track 7 on which endways laying must take place.

[0022] Advantageously, the length of the main body 4 substantially corresponds to the maximum length of the points and the track sections 2 the device 1 can be used

to substitute. In this way, thanks to the fact that the main body 4 consists of a single rigid element, it is possible to avoid the onset of deformations of the set of points or the track section 2 as they are transported to the laying zone by the self-propelled device 1.

[0023] The self-propelled device 1 has hooking means 8 operatively associated with the main body 4, and in particular with the lower zone, for selectively hooking to the main body 4 a set of points or a track section 2 positioned under the main body 4. The hooking means 8 may be made with any known configuration, and therefore are not described in detail.

[0024] To allow the device 1 to move on the ground, there are movement means 9 also associated with the main body 4 and which, depending on the embodiments, may have various configurations.

[0025] Whilst in some embodiments not illustrated the movement means 9 comprise crawler tracks, in the embodiment illustrated the movement means 9 are such that they allow the device to "walk" on the ground.

[0026] They comprise a plurality of first legs 10 able to independently support the device 1 and a plurality of second legs 11 able to independently support the device. In particular, they comprise two pairs of first legs 10 positioned on both sides of the device operating centre of gravity (with reference to the device main direction of extension) as well as two pairs of second legs 11 similarly positioned. All of the legs 10, 11 advantageously have an extended supporting foot 12 at the bottom.

[0027] Moreover, at least the first legs 10 can move relative to the main body 4 and the second legs 11, along the main direction of extension, according to the methods indicated with reference to Figures 5 to 15.

[0028] However, in the embodiment illustrated, the second legs 11 can also move relative to the main body 4 and the first legs 10 along the main direction of extension. This is achieved by slidably mounting each leg 10, 11 on two longitudinal horizontal guides 13 and connecting, between the leg 10, 11 and the main body 4, an actuator 14 (hydraulic or pneumatic) to control the movement of each leg 10, 11 along the guides 13. As Figure 16 shows, the actuator 14 comprises an outer jacket 15 fixed to the leg 10, 11 and an inner piston 16 fixed to the main body 4.

[0029] Figure 16 also shows how the two legs 10, 11 of each pair are advantageously offset in the longitudinal direction for the reasons explained below.

[0030] Advantageously, the first and/or the second legs 10, 11 can move between a raised position (that of the second legs 11 in Figure 16) and a lowered position (that of the first legs 10 in Figure 16), perpendicularly to the plane in which a set of points or a track section 2 hooked by the hooking means 8 lies or to the supporting surface formed by the movement means 9 (or rather by the feet 12 of the first or second legs 10, 11).

[0031] In the preferred embodiment, the self-propelled device 1 also comprises means 17 for widening the movement means 9, associated with the main body 4. The widening means 17 allow the movement means 9 (legs, crawler tracks, etc.) to be moved away from the main body 4, thus freeing, under the main body 4, a space sufficient to contain the railway points 2 which, at their widest point, may be wider than double a normal track section 2.

[0032] As Figure 16 shows, in the embodiment illustrated the widening means 17 comprise a hollow supporting element 18 mounted on the main body 4 and extending horizontally perpendicularly to the main direction of extension, and a movable arm 19 slidably inserted in the hollow element 18 and connected to a leg 10, 11 at its outer end (not illustrated). Suitable means, not illustrated (such as actuators), position the movable arm 19 in the hollow element 18.

[0033] To maximise the extensibility of the movable arms 19, the legs 10, 11 of each pair are offset from one another.

[0034] In accordance with the present invention, the self-propelled device 1 also comprises at least one conveyor 20, mounted above the main body 4.

[0035] The conveyor 20 extends from its first end 21 at the first end 5 of the main body 4 to its second end 22 at the second end 6 of the main body 4. As shown in the accompanying drawings, in the preferred embodiment, at least the second end 22 of the conveyor 20 (but preferably also the first end 20) is positioned cantilever-style, along the main direction of extension, relative to the second end 6 of the main body 4.

[0036] If the self-propelled device 1 is relatively long, the conveyor 20 may preferably consist of a plurality of conveyor belts 23 positioned one after another and partly overlapping along the main direction of extension. In this case, to allow the belts 23 to overlap without leaving the railway limit dimensions, the conveyor belts 23 are positioned in such a way that they are angled upwards (from the first end 21 to the second end 22 of the conveyor 20).

[0037] As described in more detail below, the aim of the conveyor 20 is to convey ballast 3 from its first end 21 to its second end 22 and to unload it in front of the second end 6 of the main body 4 along the main direction of extension.

[0038] In some embodiments not illustrated the part of the conveyor 20 forming the second end 22 (the third conveyor belt 23 in the accompanying drawings) may be rotated about a vertical axis perpendicular to the movement means supporting surface, thus allowing the ballast 3 to also be distributed at the sides of the second end 6 of the main body 4.

[0039] Advantageously, the self-propelled device 1 also comprises lifting means 24 operatively associated with the main body 4 to vary its position relative to the supporting surface formed by the movement means 9 (horizontal surface which, in practice, corresponds to the ground if the latter is without differences in level).

[0040] In particular, the lifting means 24 allow the position of the main body 4 to be varied between a lower position (Figures 5, 6 and 14) in which the hooking means

8 can hook a set of points or a track section 2 resting on the ground (or unhook it, depending on requirements), and an upper position (illustrated for example in Figures 1 to 4) in which the set of points or the track section 2 are lifted off the ground.

[0041] However, in alternative embodiments not illustrated, it may be that only the hooking means 8 move vertically.

[0042] In the embodiment illustrated, the lifting means 24 are inserted between the main body 4 and the movement means 9 to vary their position relative to one another.

[0043] In particular, in the embodiment illustrated, the lifting means 24 also move the legs 10, 11 between the raised position and the lowered position. In said embodiment, the main body 4 lifting means 24 correspond to the means which allow vertical movement of the individual legs 10, 11 to allow the self-propelled device 1 to "walk". The latter consist of the legs 10, 11 themselves which are telescopic.

[0044] Operation of the device disclosed is now described with reference to Figures 5 to 15, which schematically illustrate the various steps necessary, in accordance with the present invention, for laying a set of points or a track section 2 as a continuation of an existing track 7, as well as the relative surface part of the ballast 25.

[0045] Firstly, the new set of points or track section 2 is hooked under a self-propelled device 1 made in accordance with the present invention. If this happens a long way from the working zone 26, everything can be loaded on one or more railway vehicles to be carried close to the working zone 26 (Figure 5). In the accompanying drawings two bogies 27 are used for this purpose.

[0046] Once everything is close to the working zone 26 (Figure 6) at least the first legs 10 or the second legs 11 are moved into the lowered position so that they rest the supporting feet 12 on the ground (on the ballast 25), thus lifting the device and the set of points/track section hooked to it off the railway bogies 27 (Figure 7) which can be moved away (Figure 8). At this point, a hopper wagon 28 (or two or more if necessary) is moved to the rear of the self-propelled device 1, said hopper wagon loaded with ballast 3 and by means of its own conveyor belts 29 feeds the ballast 3 to the first end 21 of the conveyor 20 (Figure 9). The latter then conveys the ballast 3 to its second end 22 and unloads it in front of the self-propelled device 1 (Figure 9).

[0047] As the ballast 3 is fed to the conveyor 20, the self-propelled device 1 gradually moves forward in the working zone 26 (Figures 10 - 12).

[0048] As is better illustrated in Figures 1 to 4, the device moves in the following way.

[0049] With the second legs 11 resting on the ground and the first legs 10 in the raised position (Figure 1), the main body 4 and the first legs 10 are moved along the main direction of extension by an extension of the actuators 14 connected to the second legs 11 (Figure 2). When said extension of the actuators has finished, the first legs 10 are rested on the ground and the second legs 11 are raised (Figure 3). At that point the main body 4 and the second legs 11 are moved relative to the first legs 10 by a shortening of the actuators 14 connected to the first legs 10 (Figure 4).

[0050] Advantageously, simultaneously or afterwards, the actuators 14 connected to the second legs 11 are also shortened, so as to return them, relative to the main body 4, to the position illustrated in Figure 1. At that point the second legs 11 are returned to the lowered position whilst the first legs 10 are returned to the raised position and, afterwards, by operating the relative actuators 14 are again moved towards the second end 6 of the main body 4.

[0051] At that point the device is again in the position shown in Figure 1 but shifted forward as indicated by the reference line L shown in Figures 1 to 4.

[0052] Further device 1 movements are achieved by repeating the steps described above several times.

[0053] Returning to Figures 5 to 15, during device 1 movement the ballast 3 continues to be supplied until the entire working zone 26 has been filled with ballast 3 in the required way. Advantageously, during the supply of ballast 3 there may be an external intervention to level said ballast 3 in the appropriate way.

[0054] When ballast 3 laying is complete, the self-propelled device 1 and the set of points/track section 2 associated with it are above the working/laying zone 26 (Figure 13). During this step, any misalignments relative to the existing track 7 may be corrected by moving the main body 4 either with the movement means 9 or with the widening means 17. Once the set of points/track section 2 is perfectly aligned with the existing track 7, all of the legs 10, 11 are returned to the raised position so that the main body 4 is moved to its lower position and the set of points/track section 2 rests on the ground (Figure 14).

[0055] At that point, the hooking means 8 unhook the set of points/track section 2 and the first legs 10 or the second legs 11 again lift the main body 4 under which the railway bogies 27 can be inserted again if necessary. In other words, the steps illustrated in Figures 6 to 8 are repeated in reverse order until the self-propelled device 1 has been reloaded on the railway bogies 27 and can be moved away along the track 7 (Figure 15). Alternatively, the self-propelled device 1 can also move away autonomously using its movement means 9.

[0056] At this point, the intervention can be completed, if necessary, in the known way by a tamping machine able to complete the burying of the new set of points/track section 2 in the ballast 3 (normally the level of the ballast 3 initially laid is slightly lower than that required when the work is finished, to avoid possible excess errors).

[0057] What is described above also gives the method for endways laying disclosed, which may advantageously be implemented with the device described above.

[0058] Said method for endways laying of railway points and track sections 2 comprises firstly a first operating step of distributing a layer of ballast 3 on the ground, aligned with an existing track 7 to form the supporting base for the set of points or the track section 2 to be laid. Then, on top of the new ballast 3 laid, the self-propelled device 1 is moved endways, carrying the set of points or the track section 2 to be laid, until it reaches a laying position in which the set of points or the track section 2 is at the position where it must be laid. Finally, the set of points or the track section 2 is laid on the ballast 3 using the device, aligned with the existing track 7.

[0059] However, in accordance with the present invention, the step of distributing the ballast 3 is carried out during the step of endways movement of the device 1, by the action of the device 1 itself which distributes the ballast 3 in front of itself during its movement towards the laying position.

[0060] Advantageously, the step of distributing the ballast 3 in turn involves a first operating step of feeding the ballast 3 to a first end 21 of the conveyor 20 positioned on the upper part of the device, the first end 21 being at a rear end (the first end 5) of the device 1 with reference to the direction of endways movement. By means of the conveyor 20, the ballast 3 is then unloaded in front of the front end (the second end 6) of the device 1 (again with reference to its direction of endways movement).

[0061] In addition, the step of distributing the ballast 3 also involves the ballast 3 unloaded being gradually levelled to create the supporting base and the steps described above are continued during device movement towards the laying position, until creation of the supporting base is complete.

[0062] Although it is not illustrated in the accompanying drawings, the self-propelled device 1 disclosed may also be used to remove an existing set of points/track section 2.

[0063] In that case, it is sufficient to move the device to the position shown in Figure 14 above the existing set of points/track section 2, hook the set of points/track section to the device and lift it using the legs (or, in general, the lifting means 24).

[0064] The device may then be moved out of the working zone 26 by the movement means 9.

[0065] However, advantageously, if the device 1 is moved away from the working zone 26 along a direction going from the first end 5 to the second end 6 of the main body 4, during said movement away, a digger can be used to remove the ballast 3 to be substituted which can gradually be loaded on the first end 21 of the conveyor 20. The ballast 3 can then be collected by a suitable wagon positioned at the second end 22 of the conveyor 20.

[0066] Once the device has left the working zone 26, it can lay the set of points/track section 2 removed on the existing track 7 and can proceed directly to laying the new ballast 3 and the new set of points/track section 2.

[0067] It should be noticed that while removal of the existing item is carried out involving one side of the track 7 relative to the working zone 26 (that on the right in Figures 5 to 15), laying the new item involves the opposite side (that on the left in the accompanying drawings).

[0068] The present invention therefore brings important advantages.

[0069] Thanks to the present invention, it was possible to provide a self-propelled device and a method for laying railway points and/or track sections which allows the laying operations to be carried out in a much more simple and rapid way than those used until now.

[0070] Secondly, the movement means used in the embodiment illustrated allow the device to overcome undamaged any obstacles present on the ground (such as control panels, etc.).

[0071] Moreover, the self-propelled device disclosed may also be used to dismantle existing railway points or track sections which must be substituted.

[0072] It should also be noticed that the present invention is relatively easy to produce and even the cost linked to implementation of the invention is not very high.

[0073] The invention described above may be modified and adapted in several ways without thereby departing from the scope of the inventive concept.

[0074] All details of the invention may be substituted by other technically equivalent elements and, in practice, all of the materials used, as well as the shapes and dimensions of the various components, may be any according to requirements.

Claims

1. A self-propelled device for endways laying of railway points and track sections comprising:

a rigid main supporting body (4) extending from a first end (5) to a second end (6) along a main direction of extension which, in practice, is parallel with the track (7) on which endways laying must take place;
hooking means (8) operatively associated with the main body (4) for selectively hooking to the main body (4) a set of points or a track section (2) positioned below the main body (4); and
movement means (9) associated with the main body (4) for allowing device movement on the ground;
the device being **characterised in that** it also comprises a conveyor (20) mounted above the main body (4) and extending from its first end (21) positioned at the first end (5) of the main body (4) to its second end (22) positioned at the second end (6) of the main body (4), the conveyor (20) being designed to convey ballast (3) from its first end (21) to its second end (22) and unload it in front of the second end (6) of the main body (4) along the main direction of extension.

2. The self-propelled device according to claim 1, **characterised in that** the second end (22) of the conveyor (20) is positioned cantilever-style, along the main direction of extension, relative to the second end (6) of the main body (4).

3. The self-propelled device according to claim 1 or 2, **characterised in that** the conveyor (20) comprises a plurality of conveyor belts (23) positioned, along the main direction of extension, one after another and partly overlapping one another.

4. The self-propelled device according to any of the foregoing claims, **characterised in that** it also comprises lifting means (24) operatively associated with the main body (4) to vary its position relative to a supporting surface formed by the movement means (9), between a lower position in which the hooking means (8) are able to hook a set of points or a track section (2) resting on the ground, and an upper position.

5. The self-propelled device according to claim 4, **characterised in that** the lifting means (24) are inserted between the main body (4) and the movement means (9) to vary their position relative to one another.

6. The self-propelled device according to any of the foregoing claims, **characterised in that** the movement means (9) comprise a plurality of first legs (10) able to support the device independently and a plurality of second legs (11) able to support the device independently, at least the first legs (10) also being able to move relative to the main body (4) and the second legs (11) along the main direction of extension.

7. The self-propelled device according to claim 6, **characterised in that** the second legs (11) can also move relative to the main body (4) and the first legs (10) along the main direction of extension.

8. The self-propelled device according to claim 6 or 7, **characterised in that** the first and/or second legs (11) can also move between a raised position and a lowered position.

9. The self-propelled device according to claim 8, **characterised in that** the legs can move between the raised position and the lowered position perpendicularly to the plane in which a set of points or a track section (2) hooked by the hooking means (8) lies.

10. The self-propelled device according to claim 5 and claim 8 or 9, **characterised in that** the lifting means (24) move the legs between the raised position and the lowered position.

11. The self-propelled device according to any of the claims from 1 to 5, **characterised in that** the movement means (9) comprise crawler tracks.

12. The self-propelled device according to any of the foregoing claims, **characterised in that** it also comprises means (17) for widening the movement means (9), associated with the main body (4).

13. A method for endways laying of railway points and track sections comprising the operating steps of:

distributing a layer of ballast (3) on the ground, aligned with an existing track (7), to form a supporting base for the set of points or the track section (2) to be laid;
endways movement above the ballast (3) of a self-propelled device (1) carrying the set of points or the track section (2) to be laid, to a laying position in which the set of points or the track section (2) is above the supporting base; and
laying the set of points or the track section (2) on the ballast (3) using the device (1);
the method being **characterised in that** the step of distributing the ballast (3) is carried out during the step of endways movement of the device (1), by the action of the device itself which distributes the ballast (3) in front of itself during its movement towards the laying position.

14. The method according to claim 13, **characterised in that** the step of distributing the ballast (3) in turn involves the following operating steps:

supplying the ballast (3) to a first end (21) of a conveyor (20) positioned on the upper part of the device, the first end (5) being positioned at a rear end (5) of the device (1) with reference to the device (1) direction of endways movement;
by means of the conveyor (20), unloading the ballast (3) in front of a front end (6) of the device (1), with reference to its direction of endways movement;
levelling the ballast (3) unloaded to create the supporting base; and
continuing said supply and unloading steps during device (1) movement towards the laying position until creation of the supporting base is complete.

15. The method according to claim 13 or 14, **characterised in that** it uses a device made in accordance with any of the claims from 1 to 12.

Amended claims in accordance with Rule 137(2) EPC.

1. A self-propelled device for endways laying of railway points and track sections comprising:

a rigid main supporting body (4) extending from a first end (5) to a second end (6) along a main direction of extension which, in practice, is parallel with the track (7) on which endways laying must take place;
hooking means (8) operatively associated with the main body (4) for selectively hooking to the main body (4) a set of points or a track section (2) positioned below the main body (4);
movement means (9) associated with the main body (4) for allowing device movement on the ground; and a conveyor (20) mounted above the main body (4) and extending from its first end (21) positioned at the first end (5) of the main body (4) to its second end (22) positioned at the second end (6) of the main body (4), the conveyor (20) being designed to convey ballast (3) from its first end (21) to its second end (22) and unload it in front of the second end (6) of the main body (4) along the main direction of extension;
the device being **characterised in that** the movement means (9) comprise a plurality of first legs (10) able to support the device independently and a plurality of second legs (11) able to support the device independently, at least the first legs (10) also being able to move relative to the main body (4) and the second legs (11) along the main direction of extension.

2. The self-propelled device according to claim 1, **characterised in that** the second end (22) of the conveyor (20) is positioned cantilever-style, along the main direction of extension, relative to the second end (6) of the main body (4).

3. The self-propelled device according to claim 1 or 2, **characterised in that** the conveyor (20) comprises a plurality of conveyor belts (23) positioned, along the main direction of extension, one after another and partly overlapping one another.

4. The self-propelled device according to any of the foregoing claims, **characterised in that** it also comprises lifting means (24) operatively associated with the main body (4) to vary its position relative to a supporting surface formed by the movement means (9), between a lower position in which the hooking means (8) are able to hook a set of points or a track section (2) resting on the ground, and an upper position.

5. The self-propelled device according to claim 4, **characterised in that** the lifting means (24) are inserted between the main body (4) and the movement means (9) to vary their position relative to one another.

6. The self-propelled device according to any of the foregoing claims, **characterised in that** the second legs (11) can also move relative to the main body (4) and the first legs (10) along the main direction of extension.

7. The self-propelled device according to any of the foregoing claims, **characterised in that** the first and/or second legs (11) can also move between a raised position and a lowered position.

8. The self-propelled device according to claim 7, **characterised in that** the legs can move between the raised position and the lowered position perpendicularly to the plane in which a set of points or a track section (2) hooked by the hooking means (8) lies.

9. The self-propelled device according to claim 5 and claim 7 or 8, **characterised in that** the lifting means (24) move the legs between the raised position and the lowered position.

10. The self-propelled device according to any of the foregoing claims, **characterised in that** it also comprises means (17) for widening the movement means (9), associated with the main body (4).

11. A method for endways laying of railway points and track sections comprising the operating steps of:

distributing a layer of ballast (3) on the ground, aligned with an existing track (7), to form a supporting base for the set of points or the track section (2) to be laid;
endways movement above the ballast (3) of a self-propelled device (1) carrying the set of points or the track section (2) to be laid, to a laying position in which the set of points or the track section (2) is above the supporting base;
laying the set of points or the track section (2) on the ballast (3) using the device (1); and
distributing the ballast (3) during the step of endways movement of the device (1), by the action of the device itself ;
the method being **characterised in that** the ballast (3) is distributed in front of the device (1) during its movement towards the laying position.

12. The method according to claim 11, **characterised in that** the step of distributing the ballast (3) in turn involves the following operating steps:

supplying the ballast (3) to a first end (21) of a conveyor (20) positioned on the upper part of the device, the first end (5) being positioned at a rear end (5) of the device (1) with reference to the device (1) direction of endways movement;
by means of the conveyor (20), unloading the ballast (3) in front of a front end (6) of the device (1), with reference to its direction of endways movement;
levelling the ballast (3) unloaded to create the supporting base; and
continuing said supply and unloading steps during device (1) movement towards the laying position until creation of the supporting base is complete.

13. The method according to claim 11 or 12, **characterised in that** it uses a device made in accordance with any of the claims from 1 to 10.

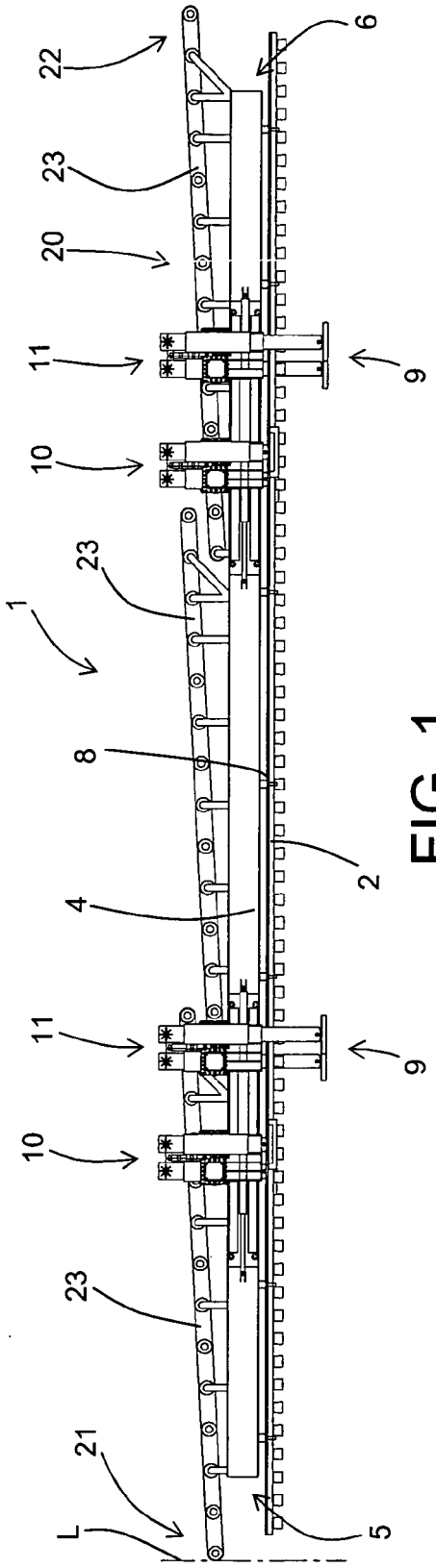
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FIG. 1

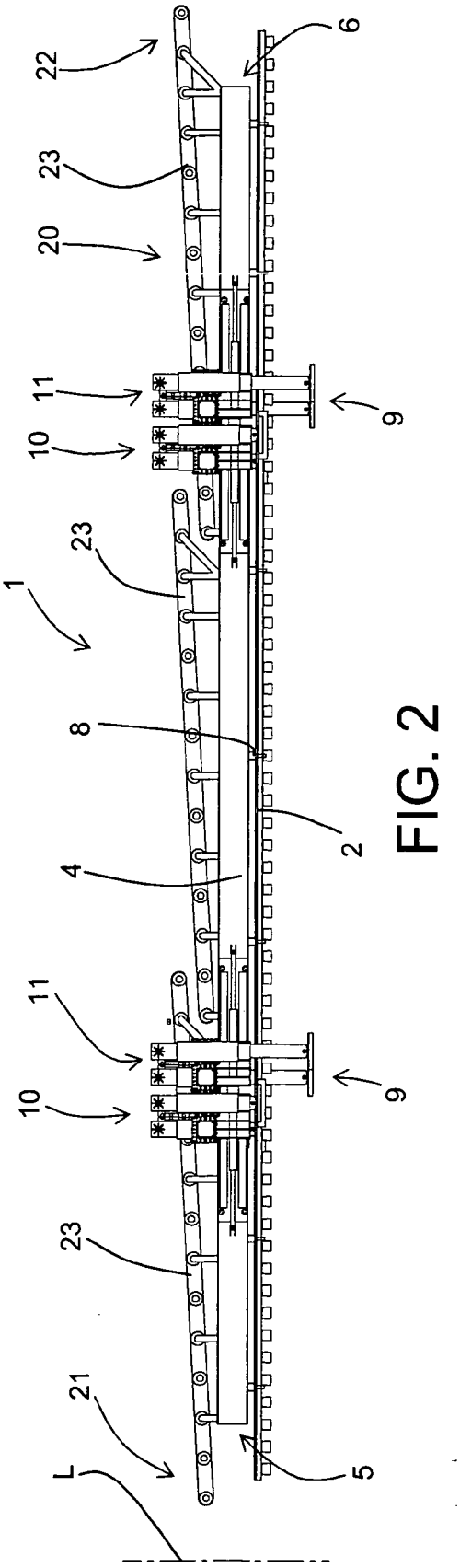
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FIG. 2

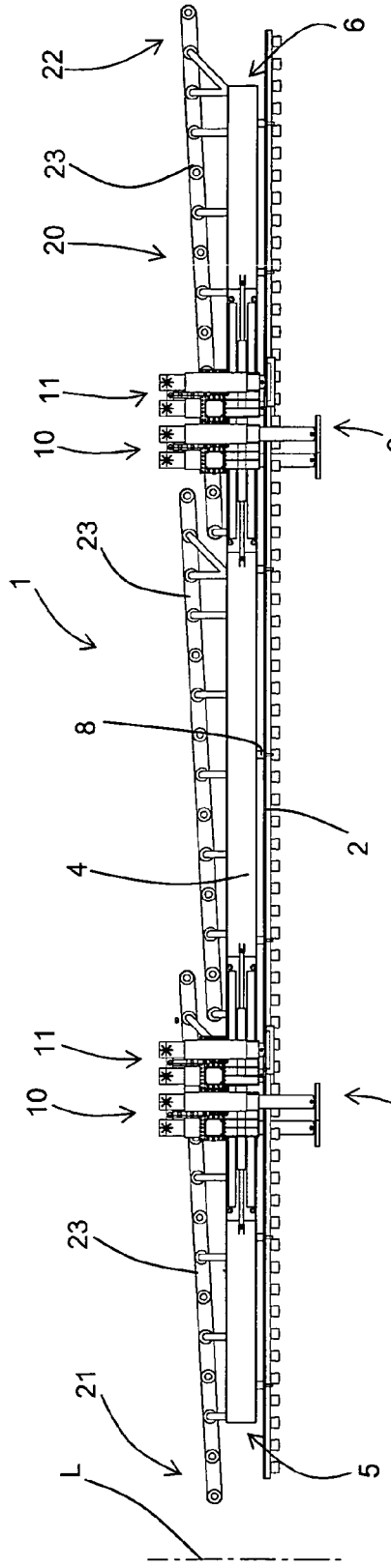
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FIG. 3

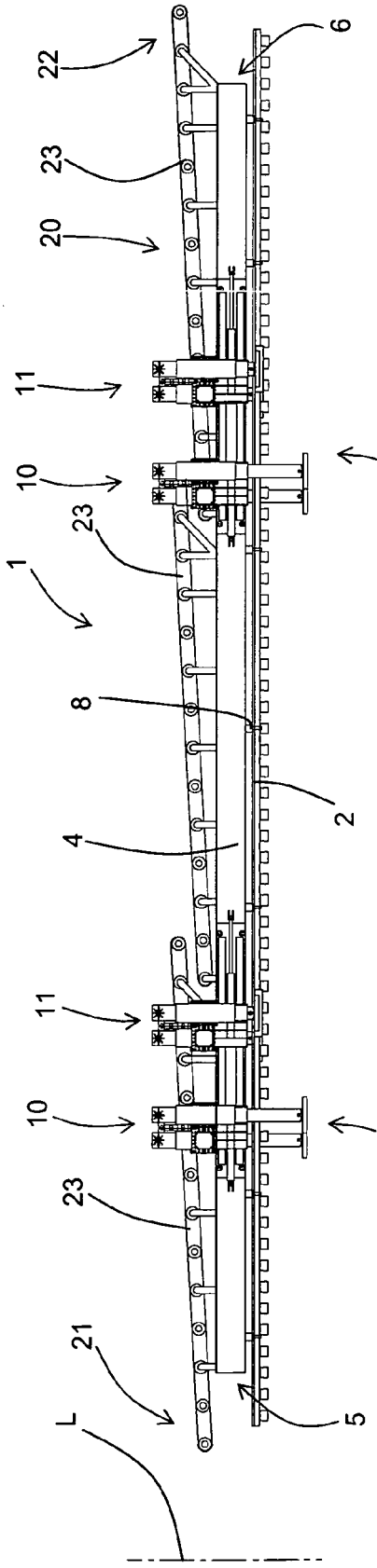
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FIG. 4

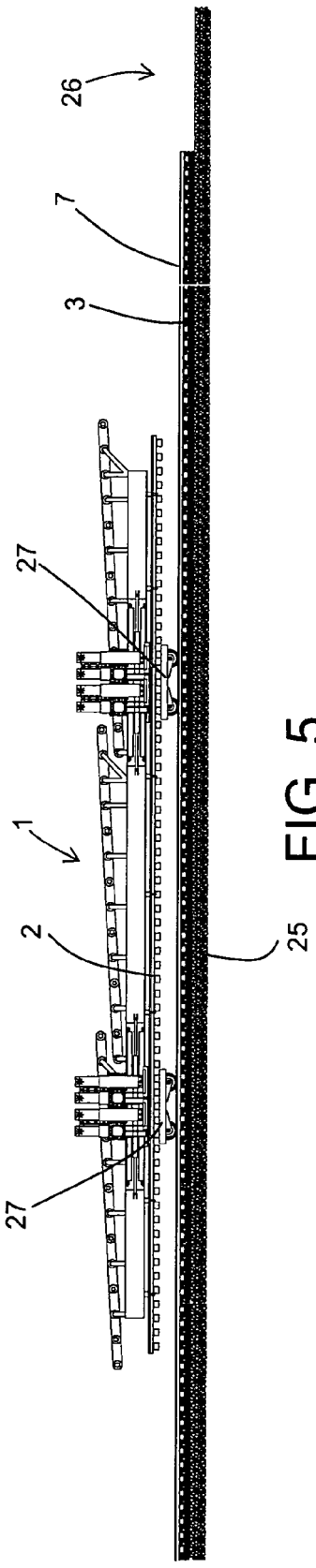

FIG. 5

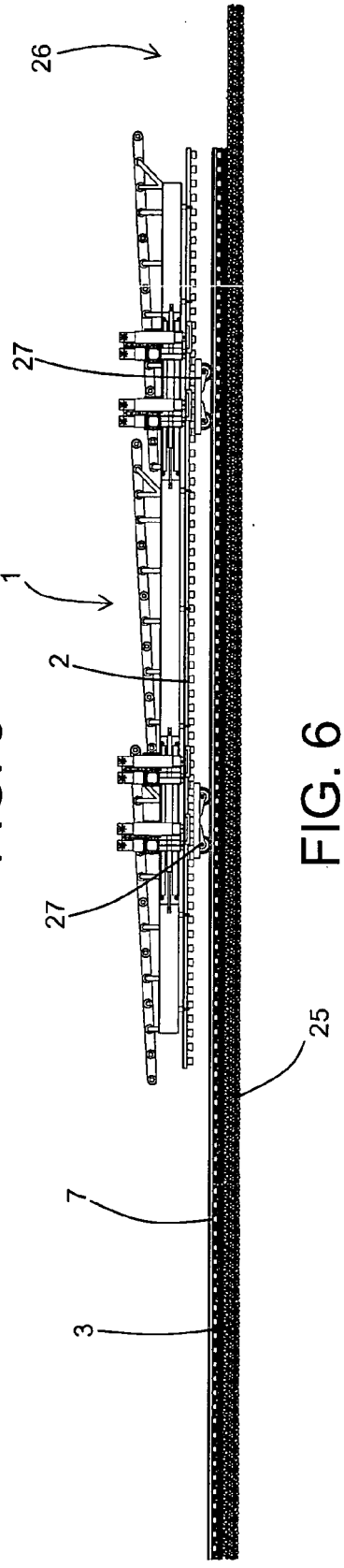

FIG. 6

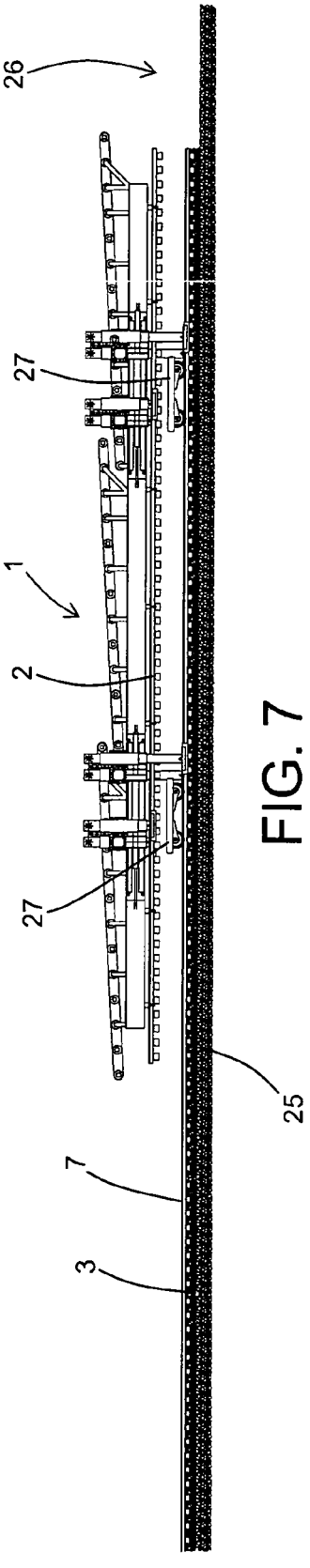

FIG. 7

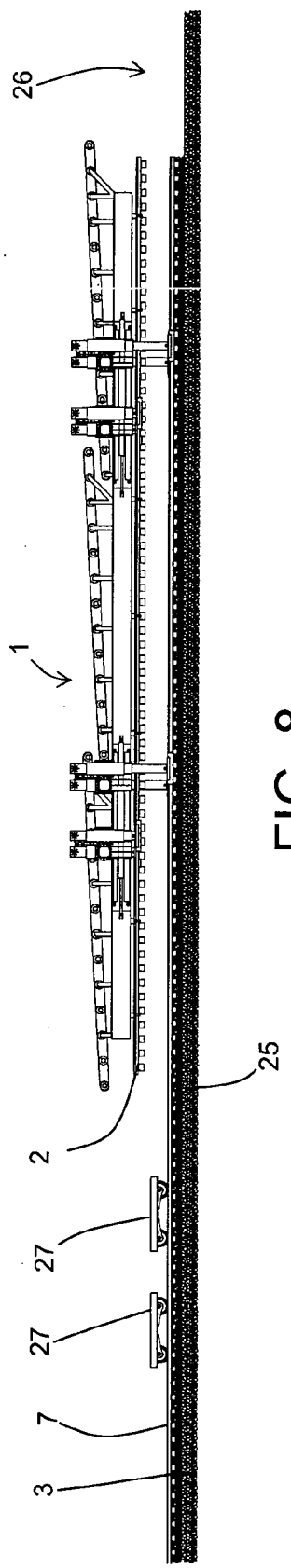

FIG. 8

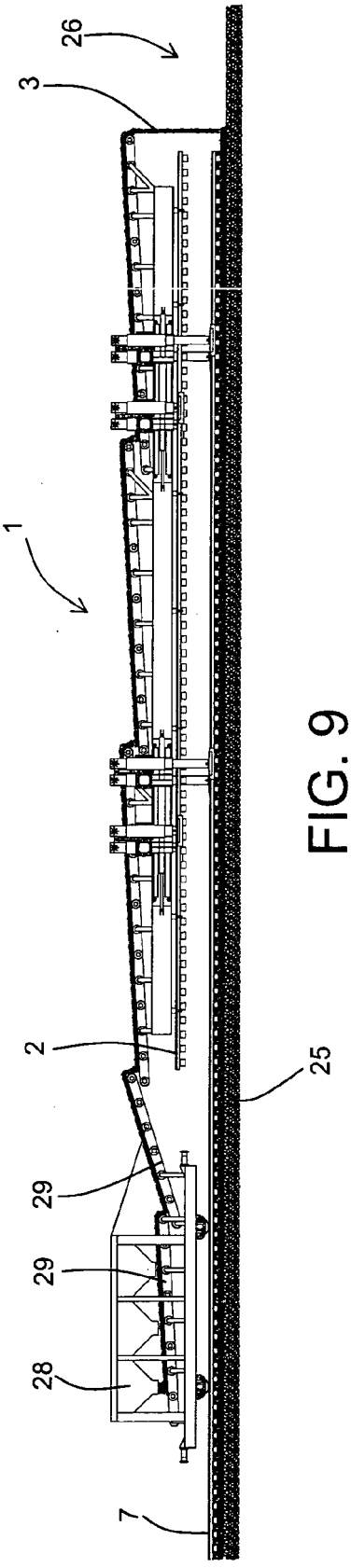

FIG. 9

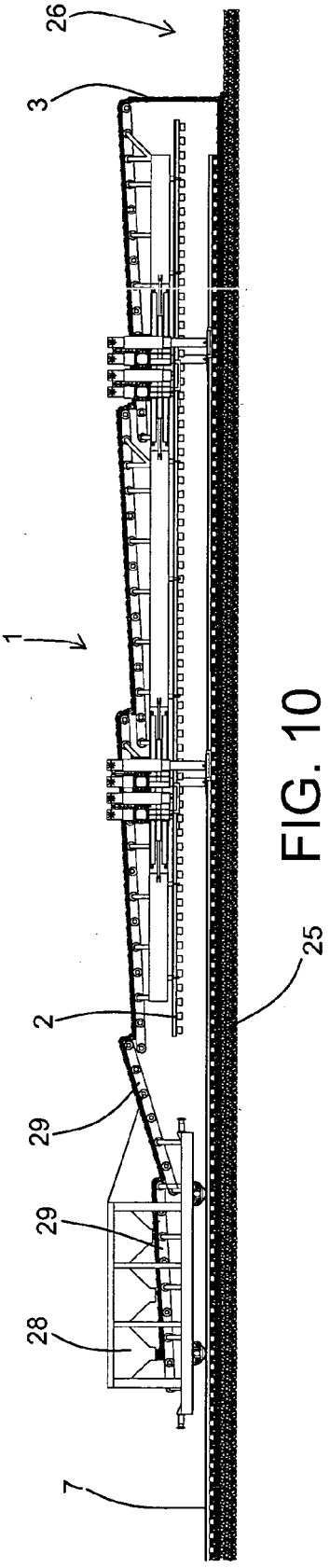

FIG. 10

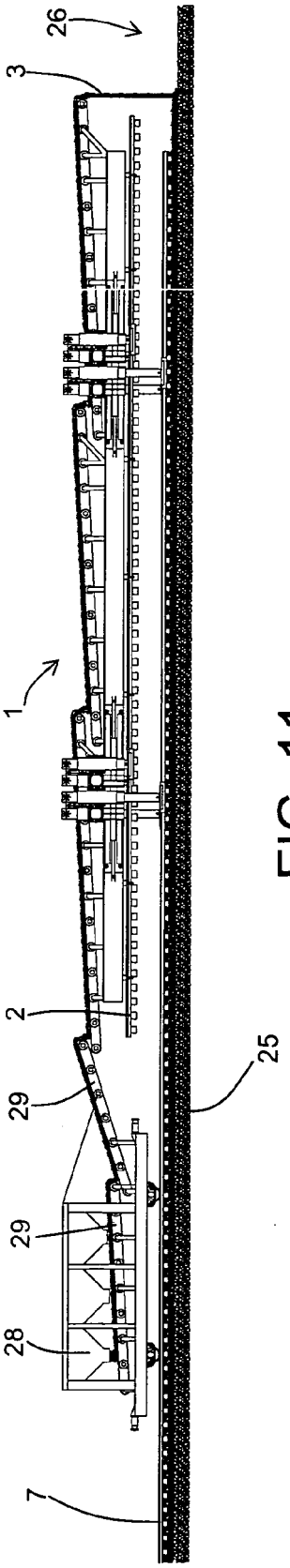

FIG. 11

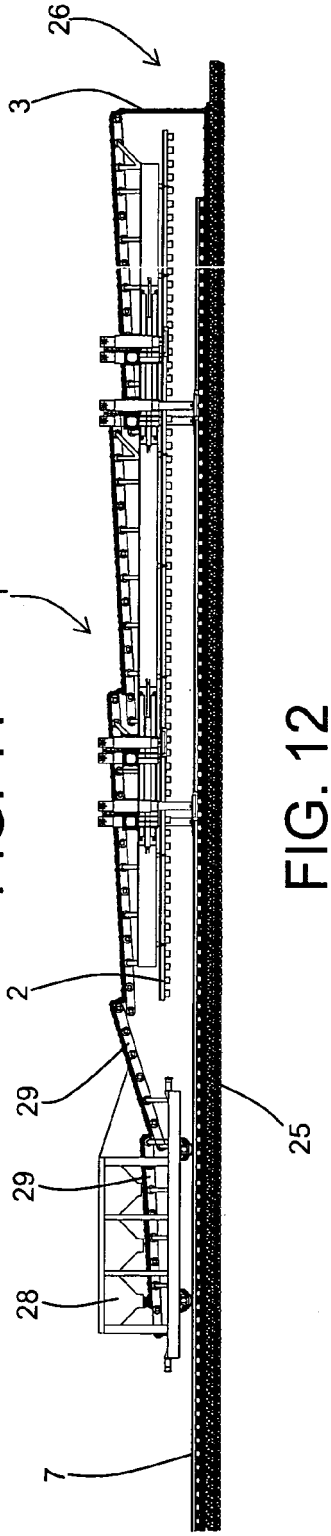

FIG. 12

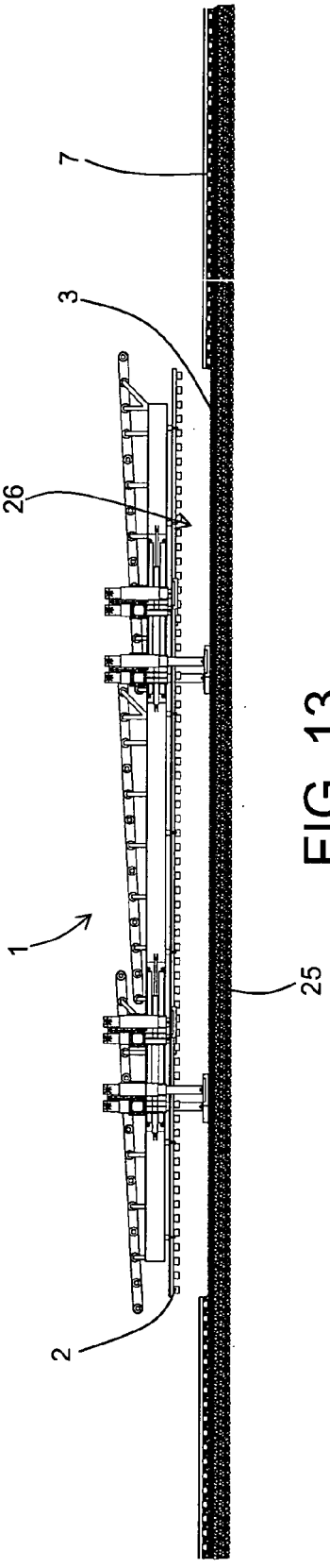

FIG. 13

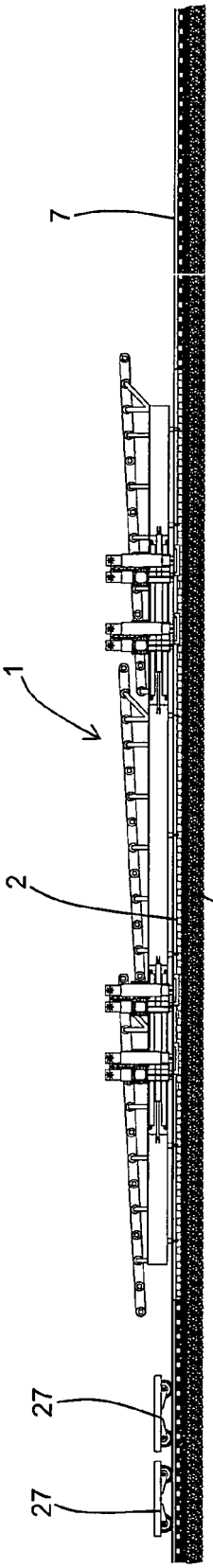

FIG. 14

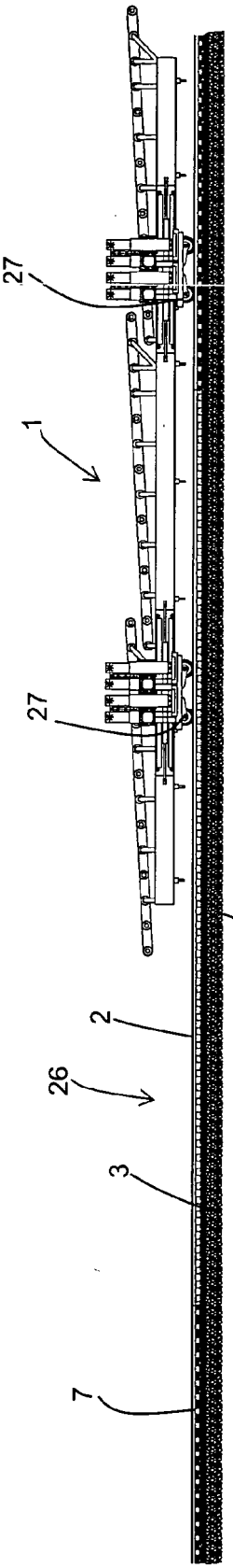

FIG. 15

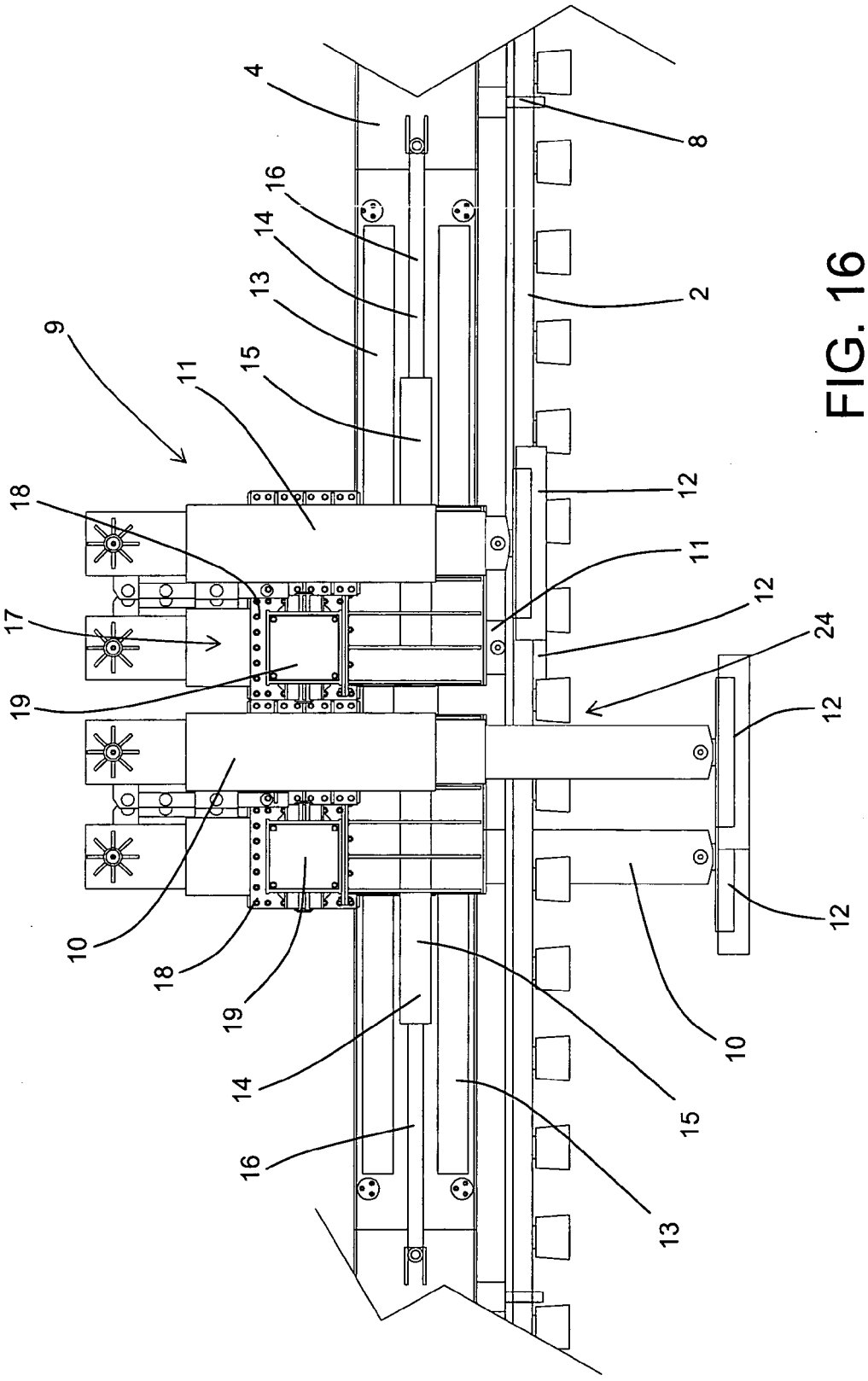

FIG. 16

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 07 42 5520

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

E01B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	12 December 2007	Movadat, Robin

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12-12-2007

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

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