(19) NL Octrooicentrum (11) **2008206**

(12)C **OCTROOI**

(21) Aanvraagnummer: **2008206**

(22) Aanvraag ingediend: **31.01.2012**

(51) Int.Cl.:
B05B 13/04 (2006.01) ***F16L 13/02*** (2006.01)
F16L 58/18 (2006.01)

(43) Aanvraag gepubliceerd:
-

(47) Octrooi verleend:
01.08.2013

(45) Octrooischrift uitgegeven:
07.08.2013

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(54) **Device and method for the coating of a surface area of a gap in the coating of a pipeline.**

(57) The present invention Device for coating a surface area of a gap in the coating of a pipeline, said surface area having a length along the central longitudinal axis of the pipeline and a width of at least part of the circumference of the pipeline.
The device according to the invention comprises:
- a frame;
- a spray nozzle support element supporting a number of spray nozzles;
- a linear motion mechanism configured for translating the spray nozzle support element relative to the frame and parallel to a longitudinal axis of the frame; and
- support members configured for arranging the frame stationary relative to the pipeline with said longitudinal axis of said frame coinciding with the central longitudinal axis of the pipeline;
such that by translating the spray nozzle support element relative to the frame by means of said linear motion mechanism, the spray nozzles are displaceable along the length of said surface area with said spray nozzles directed at said surf ace area.

NL C 2008206

Device and method for the coating of a surface area of a gap in the coating of a pipeline

The present invention is related to the coating of a surface area of a gap in the coating of a pipeline, said surface area having a length along the central longitudinal axis of the pipeline and a width of at least part of the circumference of the pipeline.

The coating of a surface area of a gap in the coating of a pipeline is known in the field of laying steel pipelines offshore on the seabed for oil and gas applications.

The outside surface of the steel wall of such pipelines is in many cases coated with a coating, for instance an anti-corrosion coating, which protects the outer surface of the steel wall from outside corrosive influences.

Such offshore pipelines are in general formed by butt-welding the ends of lengths of pipe coated with the anti-corrosion coating to one another on a pipe laying vessel, and subsequently lowering the thus formed pipeline towards the seabed. In order to be able to butt-weld the lengths of pipe to one another, the steel wall of each length of pipe is at each end thereof uncoated along a certain part of the length of pipe. This uncoated part of the lengths of pipe is referred to as a cut-back. After the ends of two lengths of pipe are placed against each other the respective ends are girth-welded. The uncoated parts of the lengths of pipe that are welded together form a gap in the anti-corrosion coating of the resulting pipeline. In order to provide a pipeline that has an anti-corrosion coating along the length thereof, the surface area of the gap is subsequently coated with an anti-corrosion coating forming material.

It is known to apply the coating on a surface area of the gap by means of a powder coating process, wherein first the surface area to be coated is heated, for instance by induction heating, and subsequently coating forming material in powder form is spayed on the heated surface area. Heat transferred from the heated surface area to the coating forming material in powder form applied thereon cures the material in powder form such that a permanent coating results.

The goal of the present invention is to provide a device for coating a surface area of a gap in the coating of a pipeline.

The device according to the invention comprises:

- a frame;
- a spray nozzle support element supporting a number of spray nozzles;
- a linear motion mechanism configured for translating the spray nozzle support element relative to the frame and parallel to a longitudinal axis of the frame; and
- support members configured for arranging the frame stationary relative to the pipeline with said longitudinal axis of said frame coinciding with the central longitudinal axis of the pipeline;

such that by translating the spray nozzle support element relative to the frame by means of said linear motion mechanism, the spray nozzles are displaceable along the length of said surface area with said spray nozzles directed at said surface area.

The device according to the inventions makes it possible to apply coating material to the surface area to be coated in a controlled and accurate way, wherein the distance over which the spray nozzle support element is translated along the central longitudinal axis of the

pipeline is adjustable to the length of the surface area to be coated in a simple way.

In an advantageous embodiment of the device according to the invention the device further comprises:

- a rotary motion mechanism configured for rotating the spray nozzle support element relative to the frame about said longitudinal axis of the frame;

such that by rotating the spray nozzle support element relative to the frame about said longitudinal axis of the frame the spray nozzles are displaceable along the width of said surface area.

These features make it possible to displace the spray nozzle support element along the width of the surface area to be coated in an accurate and controlled way. In particular this makes it possible to first translate the spray nozzle support element in one direction along the length of the surface area to be coated, then displace the spray nozzle support element along the width of the surface area to be coated, and subsequently translate the spray nozzle support element in the opposite direction along the length of the surface area to be coated such that the coating material applied on the surface area during the second translation of the spray nozzle support element along the length of the surface area partly overlaps the coating material applied in the surface area during the second translation of the spray nozzle support element along the length of the surface area. This has the advantage that the uneven distribution of the applied coating in the direction of the width of the surface area to be coated as a result of the spray cone generated by the spray nozzles can be compensated, resulting in a more uniform coating. It would however be possible to have a device according to the invention without the feature of a rotary motion mechanism.

In an advantageous embodiment of the device according to the invention the spray nozzle support element extends along at least part of a circle about said longitudinal axis of the frame, and a plurality of spray nozzle are distributed along said at least part of a circle.

These features make it possible to increase the part of the surface area to be coated along the width thereof to which coating material is applied during the translation of the spray nozzle support element in one direction relative to the frame along the length of the surface area to be coated.

In a preferred embodiment thereof the spray nozzle support element extends along a full circle about said longitudinal axis of the frame. This embodiment is in particular advantageous in case the surface area to be coated extends along the full circumference of the pipeline. Alternatively the spray nozzle support element extends along a part of a circle about said longitudinal axis of the frame. According to an advantageous development of this preferred embodiment in which the spray nozzle support element extends along a full circle about said longitudinal axis of the frame, said spray nozzle support element comprises a plurality of sub elements each extending along a part of said circle about said longitudinal axis of the frame, which sub elements are interconnected via hinges such that said sub elements are rotatable relative to each other to be able to arrange said spray nozzle support element around the circumference of said pipeline. These features provide a simple way of arranging the spray nozzle support element around the circumference of a pipeline. According to a further advantageous development the device further comprises a number of actuators for rotating said sub elements relative to each other. These features provide for

assisted rotation of the sub elements relative to each other.

According to a further advantageous development of the device according to the invention the spray nozzle support element comprises a spray chamber defined by a number of walls, which spray chamber is open towards said longitudinal axis of the frame and in which spray chamber said spray nozzles are arranged, wherein said spray chamber is configured to extend from said spray nozzles towards said longitudinal axis of the frame such that together with the surface area to be coated said spray chamber encloses a spray space.

These features prevent coating material that is forced through the spray nozzles towards the surface area to be coated to end up in the surroundings of the device where it may contaminate equipment and may be harmful for operating personnel.

According to an advantageous development of the device according to the invention comprising a spray chamber, the spray nozzle support element further comprises a seal member arranged at an end of the spray chamber away from the spray nozzles and configured to close a gap between the spray chamber and the surface area to be coated.

This feature improves the prevention of coating material ending up in the surroundings of the device.

According to an advantageous development of the device according to the invention comprising a spray chamber, the device further comprises a number of suction elements arranged in said spray chamber and connectable to a suction apparatus.

This feature allow for a controlled removal from within the spray chamber of coating material that is forced through the spray nozzles towards the surface area to be coated but

that does not adhere to the surface area, such that it is further prevented that coating material ending up in the surroundings of the device.

According to a further advantageous development of the device according to the invention comprising a number of suction elements arranged in said spray chamber and connectable to a suction apparatus, said spray nozzle support element comprises a number of separation walls arranged in the spray chamber between the suction elements and the spray nozzles, and configured for partly separating said suction elements from said spray nozzles.

These features make it possible to prevent coating material to be sucked out of the spray chamber before being brought into contact with the surface area to be coated.

According to a further advantageous development of the device according to the invention comprising a number of suction elements arranged in said spray chamber and connectable to a suction apparatus, said suction elements are arranged on opposite sides of said spray nozzles.

This feature makes it possible to improve the removal from the spray chamber of coating material that does not adhere to the surface area to be coated.

According to an advantageous further development of the device according to the invention, the device comprises an output adjustment mechanism configured for adjusting the output rate of a coating material sprayed by each of said spray nozzles.

This feature makes it possible to compensate for the variation in the influence of the gravitational force on the coating forming material as a result of different positions of the spray nozzles. Preferably, each of the spray nozzles comprise an adjustment mechanism is configured for adjusting the output rate thereof.

According to an advantageous further development of the device according to the invention, said support members include adjusting members configured for adjusting the position of said longitudinal axis of said frame relative to the central longitudinal axis of said pipeline.

This feature provides the possibility to effectively and accurately align the position of said longitudinal axis of said frame and the central longitudinal axis of said pipeline.

According to an advantageous further development of the device according to the invention, said support members are arranged to support said frame on a coated surface area of said pipeline.

This feature provides a simple and effective way to arrange the frame stationary relative to the pipeline with said longitudinal axis of said frame coinciding with the central longitudinal axis of the pipeline.

According to an advantageous further development of the device according to the invention, said support members include clamping members configured for clamping the frame on the pipeline such that the frame is stationary relative to the pipeline.

This feature helps to keep the frame of the device stationary relative to the pipeline during the use of the device.

According to an advantageous further development of the device according to the invention the frame comprises two parallel U-shaped frame elements extending perpendicular to said longitudinal axis of the frame and spaced apart along said longitudinal axis of the frame, wherein said support members are arranged on said U-shaped frame elements, and wherein said linear motion mechanism is arranged such that

said spray nozzle support element is translatable in between said U-shaped frame elements.

These features provide a simple and effective design of the frame.

The present invention further relates to a method for coating a surface area of a coated pipeline, said surface area having a length along the central longitudinal axis of the pipeline and a width of at least part of the circumference of the pipeline.

The method according to the invention comprises the steps of:

(a) arranging stationary relative to the pipeline, a frame having displaceable attached thereto a spray nozzle support element having arranged thereon a number of spray nozzles;

(b) forcing a coating forming material through said spray nozzles while displacing said spray nozzle support element relative to the frame such that

- said spray nozzles are translated in a first direction parallel to said longitudinal axis of said pipeline along the length of said surface area, and

- said coating forming material is applied on said surface area.

In a preferred embodiment thereof, the method further comprises after step (b), the steps of

(c) displacing said spray nozzle support element relative to the frame such that said spray nozzles are rotated about said longitudinal axis of said pipeline; and subsequently

(d) forcing said coating forming material through said spray nozzles while displacing said spray nozzle support element relative to the frame, such that

- said spray nozzles are translated in the direction opposite to the first direction along the length of said surface area; and

- said coating forming material is applied on said surface area;

wherein

- steps (c) and (d) are executed such that the coating material applied on the surface area in step (d) partly overlaps the coating material applied in the surface area in step (b).

According to an advantageous development of the method according to the invention, the method further comprises the step of adjusting the output rate of each of said spray nozzles such that the variation in the influence of the gravitational force on the coating forming material as a result of different positions of the spray nozzles is compensated for.

The present invention is further elucidated in the following description with reference to the accompanying schematic figures. In the figures non limitative embodiments of the device and method according to the invention are shown.

Figure 1 shows a perspective view of an embodiment of the device according to the invention arranged on a schematically shown pipeline;

Figure 2 shows a perspective view of the device of figure 1 in more detail;

Figure 3 shows in front view the spray nozzle support element of the device of figures 1 and 2;

Figure 4 shows in side view a sub element of the spray nozzle support element of figure 3;

Figures 5 to 7 show steps of the method according to the invention performed by means of the device of figures 1 to 4;

Figures 8a and 8b show part of the wall of the pipeline shown in figures 5 to 7 in cross section after subsequent steps of the method shown in figures 5 to 7.

Figure 1 shows an embodiment of a device 1 according to the invention.

The device 1 as shown in figure 1 has a frame 3 having two parallel U-shaped frame elements 5, 7 that extend perpendicular to a longitudinal axis 9 of the frame 3. The U-shaped frame elements 5, 7 are spaced apart along the longitudinal axis 9 of the frame 3 in the direction of arrows A and are connected by means of a connecting beam 11.

As shown in figure 1 the frame 3 is arranged on a pipeline 13 by means of support members that are mounted on each of the U-shaped frame elements 5, 7. The support members include adjusting members 15, 16 and clamping members 17, 19. The adjusting members are mounted at one end thereof on the U-shaped frame elements 5, 7 and extend in the direction of the longitudinal axis 9 of the frame 3. As shown in figure 1 the end of the adjusting members away from the U-shaped frame elements 5, 7 are in contact with the outer surface B of an insulating mantle 21 that surrounds the wall 23 of the pipeline 13. The clamping members 17, 19 are at one end thereof mounted on the U-shaped frame elements 5, 7 and are extendable in the direction of the longitudinal axis 9 of the frame 3. The end of the clamping members 17, 19 away from the frame 3 are, as shown in figure 1, in contact with the outer surface of the insulating mantle 21.

As shown in figure 1 the adjusting members 15, 16 and clamping members 17, 19 are extended such that the frame 3

is arranged on the pipeline 13 with the longitudinal axis 9 of the frame 3 coinciding with the central longitudinal axis 25 of the pipeline 13. The clamping members 17, 19 exert in clamping force on the surface B of the insulation mantle 21 such that the frame 3 is arranged stationary relative to the pipeline 13.

Although not shown in figure 1 adjusting members 15, 16 and clamping members 17 and 19 are mounted on each of the U-shaped frame elements.

As shown in figure 1 the frame 3 is arrangeable on the pipeline 13 and is liftable away therefrom by means of a hoisting eye 27 that is mounted on the connecting beam 11. For exemplary purposes it is shown in figure 1 that a hook 29 at the end of a chain 39 of a hoisting installation (not shown) is coupled with the hoisting eye 27.

As shown in figure 1 the device 1 is further provided with a spray nozzle support element 33 that supports a number of spray nozzles 35. The spray nozzle support element 33 as shown in figure 1 is ring-shaped and surrounds a section 13b of the pipeline that has no insulation mantle surrounding the wall 23 of the pipeline 13. The spray nozzle support element 33 extends along a full circle around the longitudinal axis 9 of the frame 3. Details of the spray nozzle support elements 33 will be described further herein below with reference to figures 3 and 4.

The device 1 of figure 1 is further provided with a linear motion mechanism 39 by means of which the spray nozzle support element 33 is translatable relative to the frame 3 parallel to the longitudinal axis 9 of the frame 3 in the direction of arrows A. Furthermore the device 1 is provided with a rotary motion mechanism 41 by means of which the spray nozzle support element 33 is rotatable relative to

the frame 3 about the longitudinal axis 9 of the frame 3 in the direction of arrows C.

Since, as shown in figure 1, the frame 3 is arranged on the pipeline 13 with the longitudinal axis 9 thereof coinciding with the central longitudinal axis 25 of the pipeline 13 and is arranged stationary relative to the pipeline 13, the spray nozzle support element 33 and spray nozzles 35 are translatable by means of the linear motion mechanism 39 along the central longitudinal axis 25 of the pipeline 13 in the direction of arrows A. Furthermore since the frame 3 is arranged on the pipeline 13 with the longitudinal axis 9 thereof coinciding with the central longitudinal axis 25 of the pipeline and since the frame 3 is arranged stationary relative to the pipeline 13, the spray nozzle support element 33 and spray nozzles 35 are rotatable about the central longitudinal axis 25 of the pipeline 13 in the direction of arrows C by means of the rotary motion mechanism 41. Details of the linear motion mechanism 39 and of the rotary motion mechanism 41 are shown in figure 2.

Figure 2 shows the device 1 of figure 1 with parts taken away to be able to show the linear motion mechanism 39 and the rotary motion mechanism 41 in more detail. The linear motion mechanism 39 is shown having two guiding rods 43 and 45 arranged on either side of the spray nozzle support element 33 and extending parallel to the longitudinal axis 9 of the frame 3.

Displaceable mounted on each of the guiding rods 43, 45 is a respective carriage 47, 49 that supports the spray nozzle support element 33. The carriages 47, 49 are displaceable along the guiding rods 43, 45 in the direction of arrows A by means of a respective rack-and-pinion type linear actuator 51, 53. The respective racks 55, 57 of the

rack-and-pinion type linear actuators 51, 53 are arranged parallel to the guiding rods 43 and 45 respectively on either side of the spray nozzle support element 33.

On each carriage 47, 49 a pinion is arranged that is driven by a respective motor 59. Each of the motors 59 of the respective rack-and-pinion type actuators 51, 53 is connected to a controller that is adapted for controlling the translation of the carriages 47 and 49 and the nozzle support element 43 supported by the carriages along the longitudinal axis 9 of the frame 3 in the direction of arrows A.

As shown in figure 2 the racks 45, 47, as well as the guiding rods 43, 45, are each at one end thereof mounted on a first support frame 61 and at the other end thereof mounted on a second support frame 63. The first support frames 61 is rotatable arranged on one of the U-shaped frame element 5, while the second support frame 63 is rotatable arranged on the other U-shaped frame element 7. The support frames 61, 63 are rotatable arranged on the respective U-shaped element 5, 7 by means of a plurality of guiding wheels 65 that are mounted on the U-shaped elements 5, 7. As shown in figure 2 each of the U-shaped support frame elements 61, 63 are interconnected by means of a number of support frame connection beams 67, 69 and 71, to form a support frame that is rotatable with respect to the frame 3 about the longitudinal axis 9 of the frame 3. Also shown in figure 2 is that on each of the U-shaped frame elements 5 and 7 a chain 73, 75 is arranged that is functionally connected with a respective toothed wheel 77, 79. The toothed wheels 77 and 79 are each driven by a respective motor 81 and 83 such that by driving the toothed wheels 77 and 79 the toothed wheels displace along the chains 73 and 75 with the result that the support frame formed by the

support frame elements 61 and 63 and the support frame connection beams 67, 69 and 71, as well as the linear motion mechanism 39 and spray nozzle support element 33 mounted thereon, rotate with respect to the frame 3 about the longitudinal axis 9 of the frame 3. Each of the motors 81 and 83 is connected to a controller that is configured to control the rotation of the support frame about the longitudinal axis 9 of the frame 3 relative to the frame 3. As shown in figure 2 protective sleeves 85 are arranged around the guiding rods 43 and 45 and racks 55 and 57 to protect the guiding rods and the racks.

In figure 3 the spray nozzle support element 33 of the device shown in figures 1 and 2 is shown, as well as the carriages 47 and 49 via which the spray nozzle support element 33 is displaceable mounted on the guiding rods 43, 45 and the racks 55 and 57 of the device as shown in figures 1 and 2. As shown in figure 3 each of the carriages 47 and 49 is provided with a first through hole 85, 87 through which the guiding rods 43, 45 extend when the carriages 47, 49 are mounted thereon, and a second through hole 89, 91 through which the racks 55, 57 extend to be engaged by pinions that are mounted on a output shaft of the respective motors 59a and 59b.

As shown in figure 3 the spray nozzle support element 33 extends along a full circle about the longitudinal axis 9 of the frame. The spray nozzle support element 33 comprises three sub elements 33a, 33b and 33c. Each of the spray nozzle support elements 33a, 33b and 33c extends along a part of the circle along which the spray nozzle support element 33 extends. Sub element 33a is mounted at each end thereof on a respective support bracket 93, 95. Sub element 33b is mounted at one end thereof on support bracket 93 via a hinge 97 such that sub element 33b is rotatable relative

to the support bracket 93 and the sub element 33a about an axis of rotation 99 that extends parallel to the longitudinal axis 9 of the frame 3. Sub element 33c is at one end thereof mounted on support bracket 95 via a hinge 101 such that sub element 33c is rotatable relative to support bracket 95 about an axis of rotation 103 that extends parallel to the longitudinal axis 9 of the frame 3. Sub element 33b is rotatable about axis of rotation 99 by means of a piston type linear actuator 105 that is with one functional end thereof mounted on support bracket 93 and with another functional end thereof mounted to sub element 33b. Sub element 33c is rotatable about axis of rotation 103 by means of a piston type linear actuator 107 that is with one functional end thereof mounted on support bracket 95 and with another functional end thereof mounted on sub element 33c.

In figure 3 is schematically shown that sub elements 33b and 33c are rotatable about their respective axis of rotation 99, 103 between a closed position and an open position. In the closed position, shown in figure 3 by means of continuous lines, the respective free ends of the sub elements 33b and 33c are in contact such that sub elements 33a, 33b and 33c form a closed circle around the longitudinal axis 9 of the frame 3. Starting in the closed position, the sub elements 33b and 33c are rotatable about their respective axis of rotation 99, 103 by means of the linear actuators 105 and 107 in the direction of arrows R, such that the respective ends of the sub elements 33b and 33c away from the ends thereof that are mounted on the support brackets 93, 95 are moved away from each other. The sub elements 33b and 33c are thus brought in the open position thereof, shown in figure 3 by means of striped lines, in which position an opening 109 is present in the

previously closed circle. With the sub elements 33b and 33c in the open position thereof, the spray nozzle support elements 33a, 33b, and 33c can be placed over a pipeline to be coated, after which the sub elements 33b and 33c are brought in the closed position thereof, such that the circumferential wall of the pipeline to be coated is enclosed by the spray nozzle support element 33.

As shown in figure 3, twelve spray nozzles 35a to 35l are evenly distributed over the circle along which the spray nozzle support element 33 extends. In figure 4 a perspective view is shown of sub element 33b of the spray nozzle support element 33. As shown in figure 4 the sub element 33c comprises a spray chamber 111 that is defined by walls 113, 115, 117, 119 and 121. In top wall 117 spray nozzles 35g to 35j are arranged. The side walls 113 and 121 extend from the top walls 115 and 119 towards the longitudinal axis 9 of the frame 3 when sub element 33c is in the closed position thereof. The side walls 113 and 121 have a free end 113a and 121a, such that the spray chamber 111 is open towards the longitudinal axis 9 of the frame 3 when sub element 33c is in the closed position thereof.

As shown in figure 4 a brush type seal member 123, 125 is arranged on the respective free ends 113a, 121a of side walls 113, 121. In use, when a pipeline to be coated is arranged within the enclosed circle of the spray nozzle support element 33, the side walls 113, 121 extend towards the outer surface of the wall of the pipeline to be coated, which outer surface is schematically shown in figure 4 by means of the surface area S enclosed by striped lines. As shown in figure 4, the brush type seal members 123 and 125 close the gap G between the free ends 113a and 121a of the side walls 113 and 121 and the surface area S to be coated.

As a result the spray chamber 111 in combination with the surface area S to be coated forms a spray space.

The spray nozzles 35g to 35j are arranged such that, with the sub element 33c in the closed position, the outlet thereof is directed towards the longitudinal axis 9 of the frame 3, such that when the sub elements 33a, 33b and 33c are arranged around the circumferential wall of a pipeline, the outlets of the spray nozzles 35g to 35j are directed towards the surface area S to be coated.

As shown in figure 4 suction elements in the form of suction holes 127 that are connectable to a suction apparatus (not shown) are arranged in top walls 115, 119. The suction holes 127 are partly separated from the spray nozzles 35g to 35j by means of separation walls 129 and 131 that are arranged in the spray chamber 111 between the spray nozzles and the suction holes. The suction holes 127 are arranged on opposite sides of the spray nozzles 35g and 35j. When coating material 123 is forced through the outlets of the spray nozzles a spray cone 135 of coating material results, such that coating material 133 is applied to a spray area P on said surface area S to be coated. Coating material that does not adhere to the surface area S to be coated is sucked through the suction holes 127 by means of the suction apparatus connected thereto (not shown) as shown by means of the arrows D. The separation walls 129 and 131 avoid that coating material 133 is sucked through the suction holes 127 before being brought in contact with the surface area S to be coated.

Sub elements 33a and 33c are configured the same way as sub element 3c that is shown in figure 4. In the closed position of the sub elements 33a, 33b and 33c, the ends 135 and 137 of the sub elements are brought into contact with the respective neighboring sub element, such that the spray

chambers 111 of the respective sub elements form the spray chamber of the spray nozzle support element 33. The spray chamber of the spray nozzle support element 33 in combination with the surface area S to be coated forms an enclosed spray space.

In figures 5 to 7 the method according to the invention is schematically shown.

In figures 5 to 7 a part of pipeline 13 as shown in figure 1 is shown. Pipeline 13 has a wall 23, for instance made of steel. The pipeline 13 is formed by butt-welding the end 137a of a first length of pipe 137 to the end 139a of a second length of pipe 139 by means of a circumjacent girth-weld 141. Each length of pipe 137, 139 has an insulating mantle 21 with outer surface B that surrounds the wall 23 of the respective length of pipe. The insulating mantle 21 is for instance formed by a thermo-insulating coating made of polypropylene. Between the insulating mantle 21 and the outer surface 23a of the wall 23 of each length of pipe 137, 139 an anticorrosion coating 143 is arranged.

To be able to butt-weld the ends of the lengths of pipe by means of the circumjacent girth-weld 141, each length of pipe 137, 139 is at the respective end 137a, 139a thereof uncoated along a certain part L137, L139 of the length of pipe 137, 139, such that a so-called cut back results. After butt-welding the ends of the lengths of pipe 137, 139, the uncoated ends 137a, 139a form a gap 145 in the insulating mantle 21 and the anticorrosion coating 143 of the resulting pipeline 13.

To close the gap 145 the uncoated surface area S of the outer surface 23a of the wall 23 is heated, for instance in case of a steel wall by heating the wall 23 by means of induction heating. After heating the uncoated area S of the outer surface 23a of the wall 23 coating material

in the form of powder is applied to the heated surface area S to be coated by means of the device 1 according to the invention as shown in figures 1 to 4. To that effect, the frame 3 of the device 1 according to the invention is arranged stationary relative to the pipeline 13, and the spray nozzle support element 33 is arranged around the circumferential wall 23 of the pipeline 13. The result of the step is shown in figure 1. Subsequently, coating forming material 133 in the form of powder is forced through the spray nozzle 35 arranged on the spray nozzle support element 33. As shown in figure 4 and figure 5 this results in coating forming material 133 to be applied on the surface area S as to be coated in a spray area P for each spray nozzle 35. For clarity reasons, only one spray area P of one of the spray nozzles is shown in figure 6 and 7 during the displacement of the spray nozzle support element 33 and the spray nozzles arranged thereon. While forcing the coating forming material 133 through the spray nozzles, the spray nozzle support element is displaced relative to the frame 3 such that the spray nozzles are translated in a first direction E parallel to the longitudinal axis 25 of the pipeline 13 by displacing said spray nozzle support element 33 along the guiding rods 43, 45 parallel to the longitudinal axis 9 of the frame 3 that coincides with the longitudinal axis 25 of the pipeline as is shown in figure 6. When the end of the surface area S to be coated is reached, the spray nozzle support element 33 is displaced relative to the frame 3 such that the spray nozzles are rotated about said central longitudinal axis 25 of said pipeline 13 in the direction F and the spray nozzle support element 33 is translated in the direction H opposite to the first direction E along the length L of said surface area S to be coated, such that the coating material applied on the

surface area S while displacing the spray nozzle support element in the direction of arrow H partly overlaps the coating material that was applied while displacing the spray nozzle support element 33 in the direction of arrow E during the previous step.

The coating material in the form of powder applied to the heated surface area S to be coated is heated by heat transferred from the wall 23 to said coating material such that an anti-corrosion coating applied to the surface area S results. This process of applying and heating powder as a coating material to form a coating is a so-called powder coating process.

As shown in figures 5 to 7 the translation of the spray nozzle support element 33 starts at a start position and ends at an end position such that the coating material applied to the surface area S to be coated partly overlaps the anti-corrosion coating 143 that was already arranged on the wall 23 of the lengths of pipe 137, 139, such that a continuous anticorrosion coating results.

As shown in figures 4 and 5 the spray areas P of neighboring spray nozzles 35 overlap. The result of the application of coating material to the surface area S after the step of translating the spray nozzle support element 33 in the direction of arrow E and before the step of translating the spray nozzle support element in the direction of arrow H is shown in figure 8a. As shown in figure 8a the thickness of the applied layer of coating material 145 varies along the circumference of the wall 23.

The result of the application of coating material to the surface area S after the step of translating the spray nozzle support element 33 in the direction of arrow H is shown in figure 8a. As shown in figure 8b the variation of the thickness of the applied layer of coating material 145

along the circumference of the wall 23 is less than the result before the step of translating the spray nozzle support element 33 in the direction of arrow H as shown in figure 8a.

As a result of the distribution of the spray nozzles over a full circle as shown in figures 1 to 3, the whole surface area S to be coated can be more uniformly coated by translating the spray nozzle support element one time in the direction of arrow E and one time in the direction of arrow H.

The description and drawings merely illustrate the principles of the invention. It will thus be appreciated that those skilled in the art will be able to devise various arrangements that, although not explicitly described or shown herein, embody the principles of the invention and are included within its spirit and scope.

Furthermore, all examples recited herein are principally intended expressly to be only for pedagogical purposes to aid the reader in understanding the principles of the invention and the concepts contributed by the inventor(s) to furthering the art, and are to be construed as being without limitation to such specifically recited examples and conditions. Moreover, all statements herein reciting principles, aspects, and embodiments of the invention, as well as specific examples thereof, are intended to encompass equivalents thereof.

Conclusies

1. Inrichting voor het coaten van een oppervlak van een opening in de coating van een pijpleiding, waarbij het oppervlak een lengte langs de centrale langsaslijn van de pijpleiding heeft en een breedte van ten minste een gedeelte van de omtrek van de pijpleiding, waarbij de inrichting omvat:

- een gestel;
- een spuitmondondersteuningselement dat een aantal spuitmonden ondersteunt;
- een lineair bewegingsmechanisme dat is geconfigureerd voor het transleren van het spuitmondondersteuningselement ten opzichte van het gestel en parallel aan een langsaslijn van het gestel; en
- ondersteuningsorganen die zijn geconfigureerd voor het stationair ten opzichte van de pijpleiding arrangeren van het gestel waarbij de langsaslijn van het gestel samenvalt met de centrale langsaslijn van de pijpleiding;

zodanig dat bij het transleren van het spuitmondondersteuningselement ten opzichte van het gestel door middel van het lineaire bewegingsmechanisme, de spuitmonden verplaatsbaar zijn langs de lengte van het oppervlak met de spuitmonden gericht in de richting van het oppervlak.

2. Inrichting volgens conclusie 1, verder omvattende

- een rotatie bewegingsmechanisme dat is geconfigureerd voor het roteren van het spuitmondondersteuningselement ten opzichte van het gestel om de langsaslijn van het gestel;

zodanig dat door het roteren van het spuitmondondersteuningselement ten opzichte van het gestel om de langsaslijn van het gestel, de spuitmonden verplaatsbaar zijn langs de breedte van het oppervlak.

3. Inrichting volgens conclusie 1 of 2, waarbij

- het spuitmondondersteuningselement zich uitstrekt langs ten minste een gedeelte van een cirkel rond de langsaslijn van het gestel; en
- een meervoud spuitmonden zijn verdeeld over ten minste een gedeelte van de cirkel.

4. Inrichting volgens conclusie 3, waarbij

- het spuitmondondersteuningselement zich uitstrekt over een volle cirkel rond de langsaslijn van het gestel.

5. Inrichting volgens conclusie 4, waarbij

- het spuitmondondersteuningselement een meervoud subelementen omvat die zich uitstrekken over een gedeelte van de cirkel rond de longitudinale aslijn van het gestel, welke subelementen onderling zijn verbonden door middel van scharnieren zodanig dat de subelementen roteerbaar zijn ten opzichte van elkaar om het mogelijk te maken het spuitmondondersteuningselement rond de omtrek van de pijpleiding te arrangeren;

waarbij bij voorkeur de inrichting verder omvat

- een aantal actuatoren voor het roteren van de subelementen ten opzichte van elkaar.

6. Inrichting volgens één van de conclusies 1 tot en met 5, waarbij

- het spuitmondondersteuningselement een spuitkamer omvat die is gedefinieerd door een aantal wanden, welke kamer open is richting de langsaslijn van het gestel en in welke spuitkamer de spuitmonden zijn gearrangeerd; en

waarbij

- de spuitkamer is geconfigureerd om zich vanuit de spuitmonden richting de langsaslijn van het gestel uit te strekken zodanig dat de spuitkamer samen met het te coaten oppervlak een spuitruimte omsluit.

7.Inrichting volgens conclusie 6, waarbij het spuitmondondersteuningselement verder een afdichtorgaan omvat dat gearrangeerd is aan een van de spuitmonden afgekeerd einde van de spuitkamer en dat geconfigureerd is om een opening tussen de spuitkamer en het te coaten oppervlak te sluiten.

8. Inrichting volgens conclusie 6 of 7, verder omvattende

- een aantal afzuigelementen die gearrangeerd zijn in de spuitkamer en die te verbinden zijn met een afzuigapparaat.

9. Inrichting volgens conclusie 8, waarbij

- het spuitmondondersteuningselement een aantal afscheidingswanden omvat die zijn gearrangeerd in de spuitkamer tussen de afzuigelementen en de spuitmonden in, en die zijn geconfigureerd voor het gedeeltelijk afscheiden van de afzuigelementen van de spuitmonden.

10. Inrichting volgens conclusie 8 of 9, waarbij

- de afzuigelementen zijn gearrangeerd aan tegenoverliggende zijden van de spuitmonden.

11. Inrichting volgens één van de conclusies 1 tot en met 10, waarbij

- de inrichting een opleveringaanpassingsmechanisme omvat dat is geconfigureerd om de mate van oplevering van een coating materiaal gespoten door elke van de spuitmonden aan te passen, waarbij bijvoorkeur elke van de spuitmonden een aanpassingsmechanisme omvat dat is geconfigureerd om de oplevering van de betreffende spuitmond aan te passen.

12. Inrichting volgens één van de conclusies 1 tot en met 11, waarbij de ondersteuningsorganen aanpassingsorganen hebben die zijn geconfigureerd om de positie van de langsaslijn van het gestel ten opzichte van de centrale langsaslijn van de pijpleiding aan te passen.

13. Inrichting volgens één van de conclusies 1 tot en met 12, waarbij de ondersteuningsorganen zijn gearrangeerd om het gestel te ondersteunen op een gecoat oppervlak van de pijpleiding.

14. Inrichting volgens één van de conclusie 1 tot en met 13, waarbij de ondersteuningsorganen klemorganen hebben die zijn geconfigureerd voor het klemmen van het gestel op de pijpleiding zodat het gestel stationair is ten opzichte van de pijpleiding.

15. Inrichting volgens één van de conclusies 1 tot en met 14, waarbij het gestel twee parallelle U-vormige gestelelementen omvat die zich loodrecht op de langsaslijn

van het gestel uitstrekken en die zich op afstand van elkaar bevinden langs de langsaslijn van het gestel, waarbij de ondersteuningsorganen gearrangeerd zijn op de U-vormige gestelelementen, en waarbij het lineaire bewegingsmechanisme zodanig is gearrangeerd dat het spuitmondondersteunings-element tussen de U-vormige gestelelementen in te transleren is.

16. Werkwijze voor het coaten van een oppervlak van een gecoate pijpleiding, waarbij het oppervlak een lengte heeft langs de centrale langsaslijn van de pijpleiding en een breedte van ten minste een gedeelte van de omtrek van de pijpleiding, waarbij de werkwijze de stappen omvat van:

a) het stationair ten opzichte van de pijpleiding arrangeren van een gestel met een verplaatsbaar daaraan aangebracht spuitmondondersteuningselement waarbij op het spuitmondondersteuningselement een aantal spuitmonden zijn gearrangeerd;

b) het door de spuitmonden heen forceren van een coatingvormend materiaal terwijl het spuitmondondersteuningselement ten opzichte van het gestel wordt verplaatst zodat:

- de spuitmonden in een eerste richting parallel aan de langsaslijn van de pijpleiding langs de lengte van het oppervlak worden getransleerd; en
- het coatingvormende materiaal op het oppervlak wordt aangebracht.

17. Werkwijze volgens conclusie 16, verder omvattende na stap (b), de stappen van:

(c) het verplaatsen van het spuitmondondersteuningselement ten opzichte van het gestel

zodat de spuitmonden worden geroteerd om de langsaslijn van de pijpleiding; en vervolgens

(d) het forceren van het coatingvormende materiaal door de spuitmonden heen terwijl het spuitmondondersteuningselement ten opzichte van het gestel wordt verplaatst, zodat:

- de spuitmonden worden getransleerd in de richting tegengesteld aan de eerste richting langs de lengte van het oppervlak; en

- het coatingvormende materiaal op het oppervlak wordt aangebracht;

waarbij

- stappen (c) en (d) zodanig worden uitgevoerd dat het in stap (d) op het oppervlak aangebrachte coating materiaal gedeeltelijk het in stap (b) op het oppervlak aangebrachte coating materiaal overlapt.

18. Werkwijze volgens conclusie 16 of 17, verder omvattende de stap van:

- het aanpassen van de mate van oplevering van elke van de spuitmonden zodat wordt gecompenseerd voor de variatie van de invloed van de zwaartekracht op het coatingvormende materiaal als het gevolg van verschillende posities van de spuitmonden.

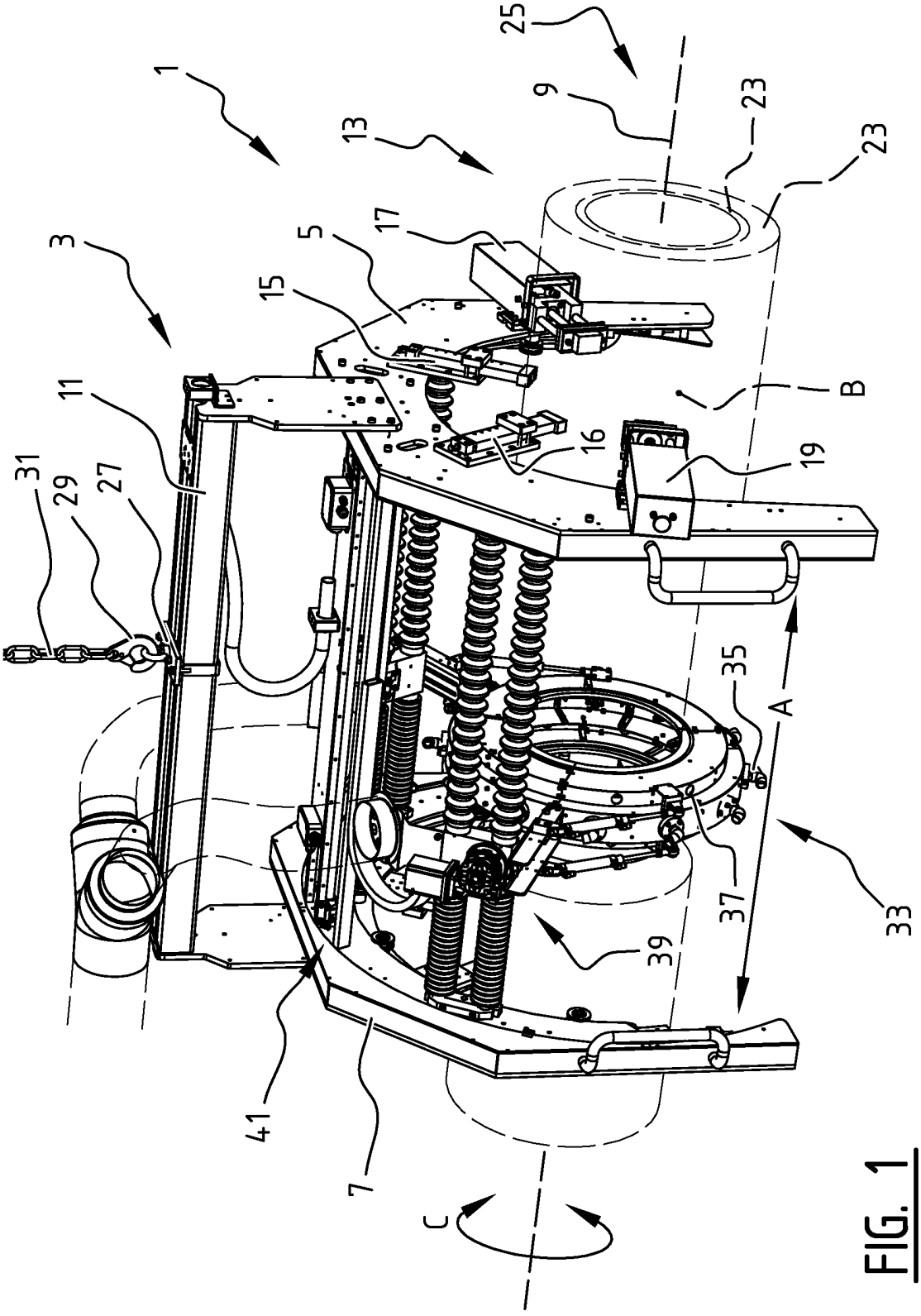
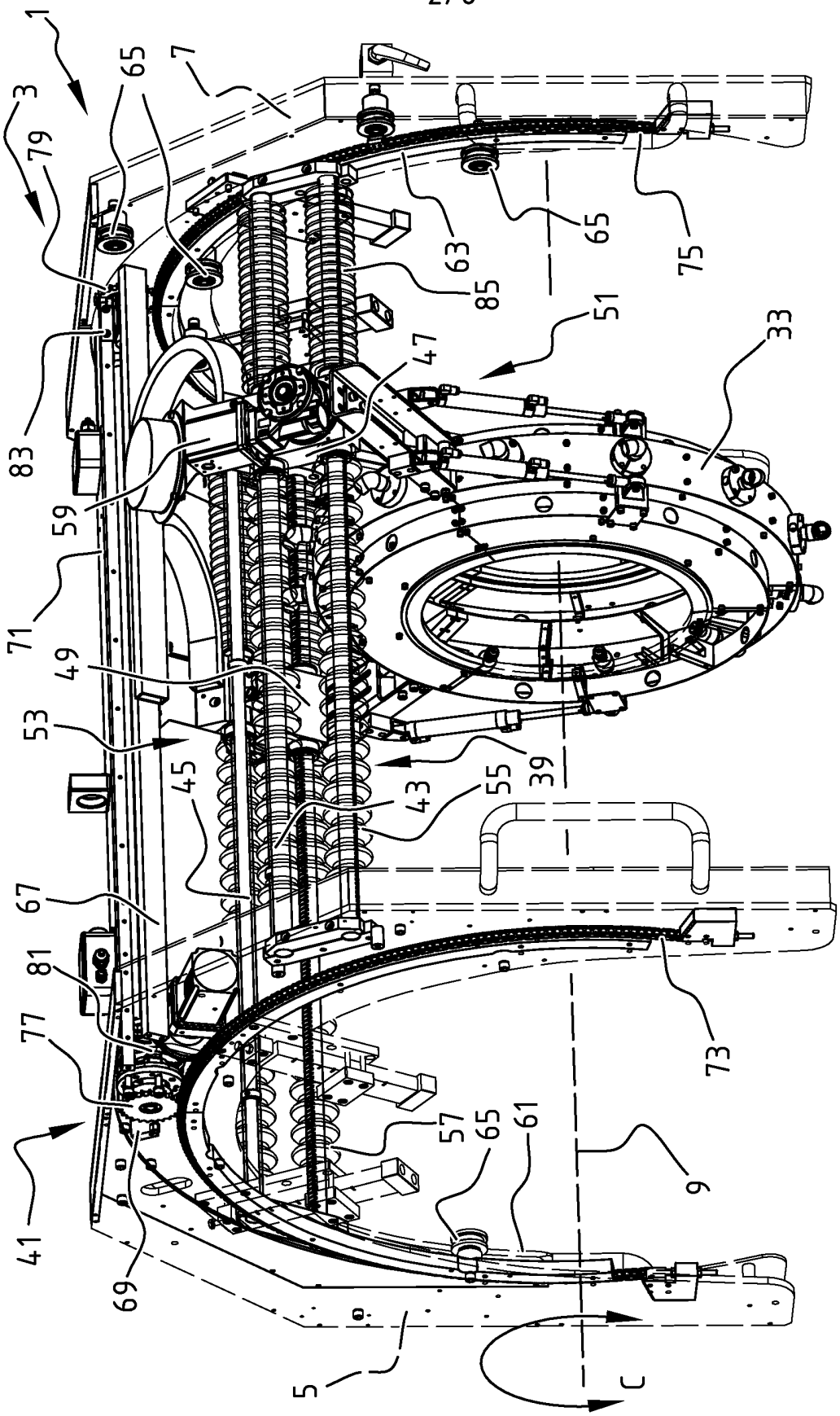


FIG. 1


1
3
79
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7
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47
83
59
71
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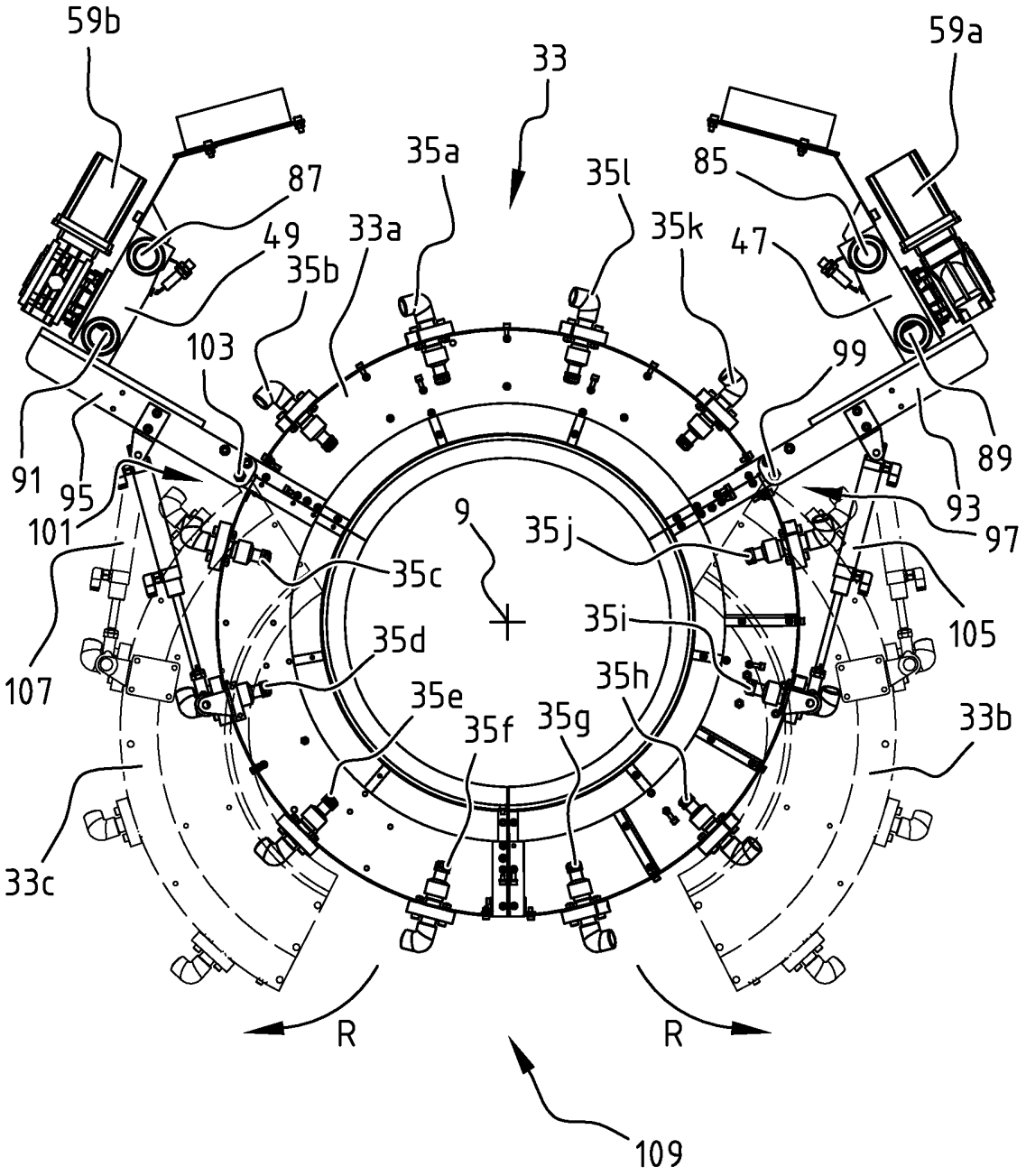
5
C
A

FIG. 2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59a
33
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35l
85
87
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33a
35k
47
35b
103
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95
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97
9
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105
107
35d
35h
35e
35f
35g
33b
33c
R
R
109

FIG. 3

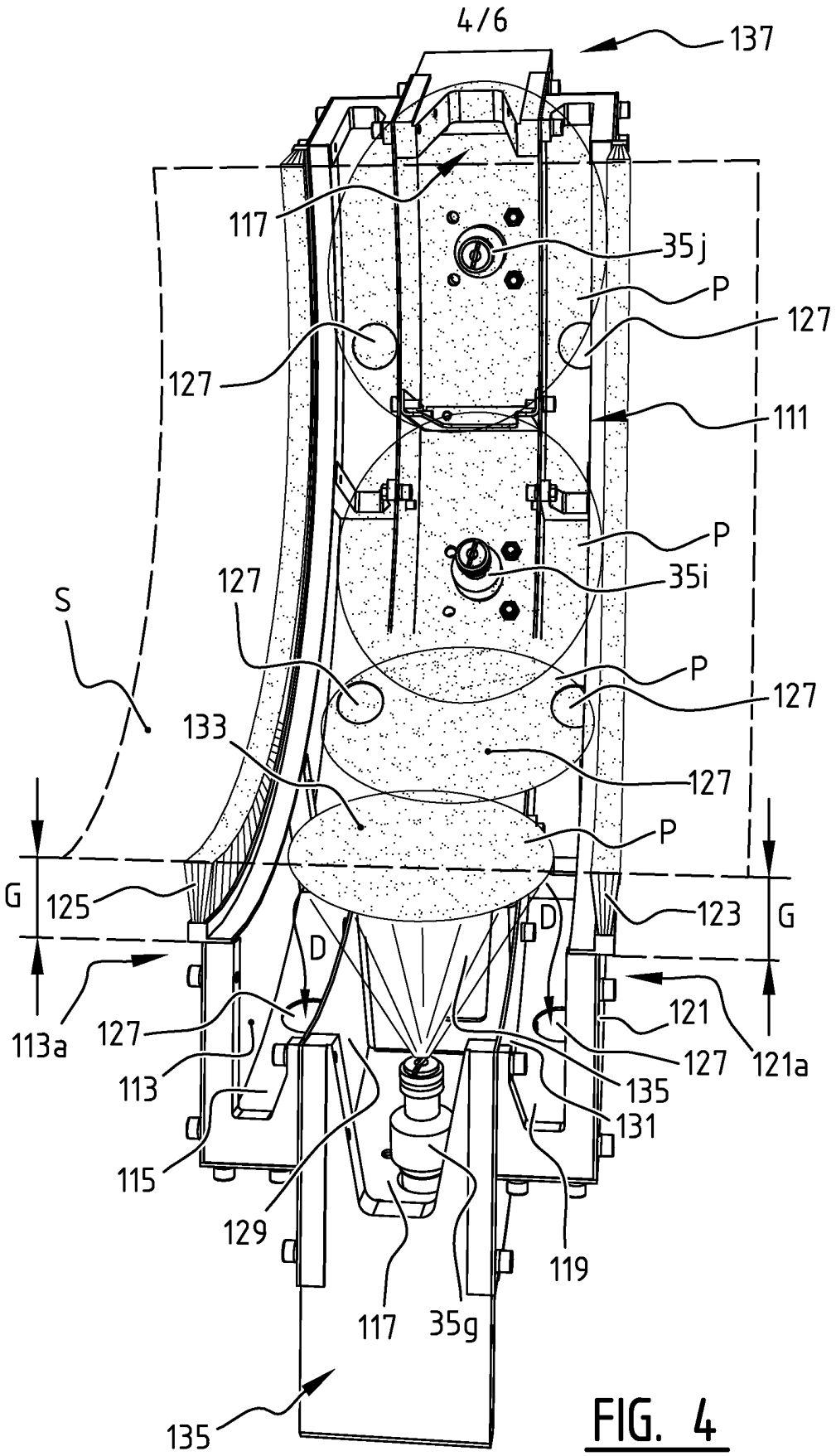
137
117
35j
P
127
127
111
P
35i
127
S
P
127
133
127
P
G
125
123
G
D
D
113a
127
121
127
121a
113
135
131
115
129
119
117
35g
135

FIG. 4

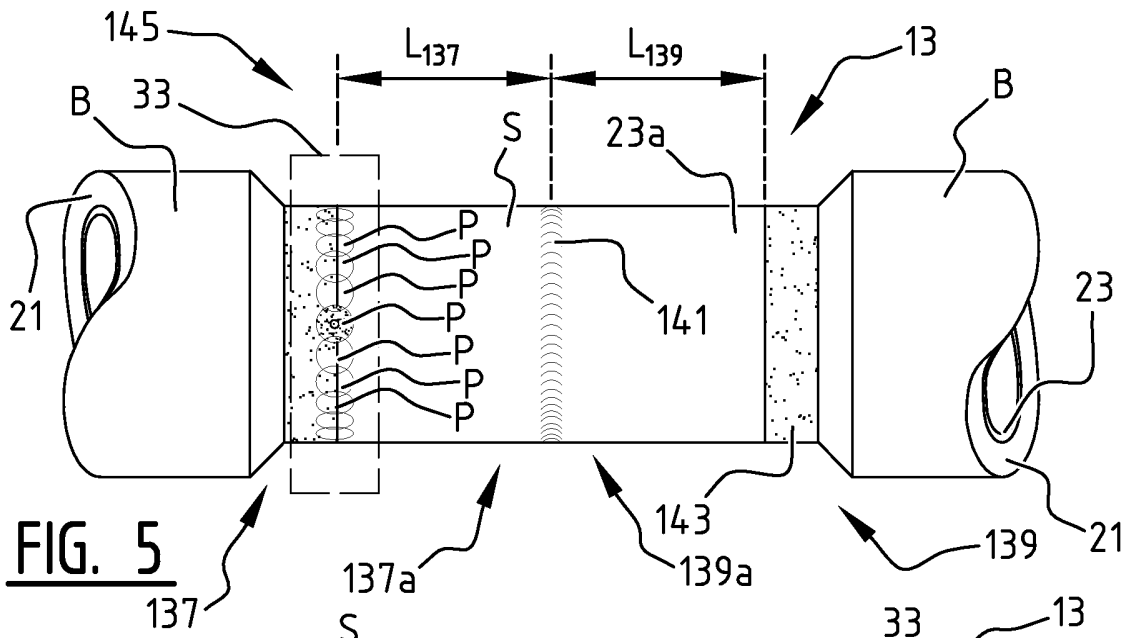

FIG. 5

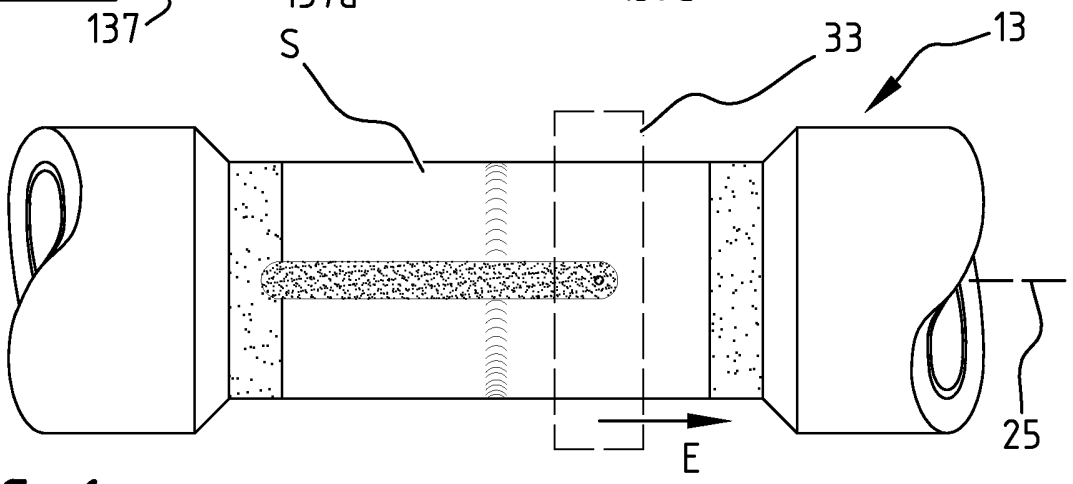

FIG. 6

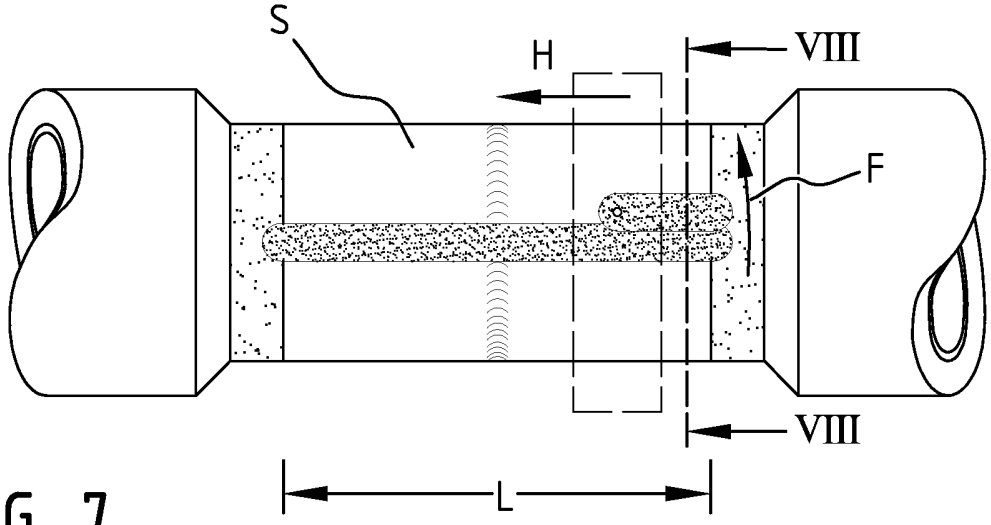

FIG. 7

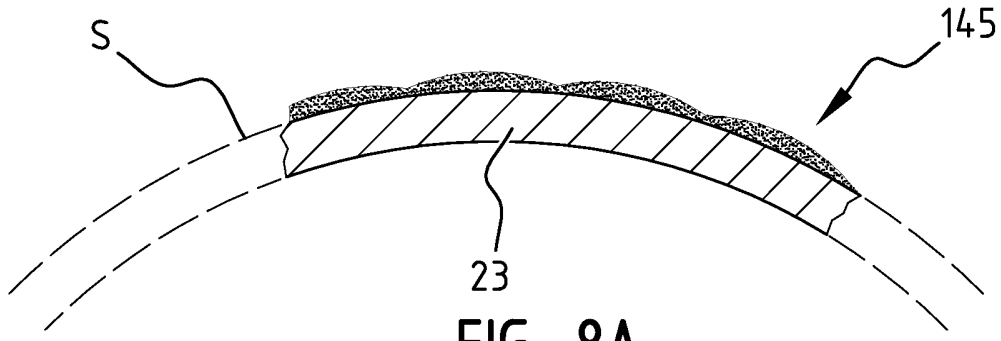

FIG. 8A

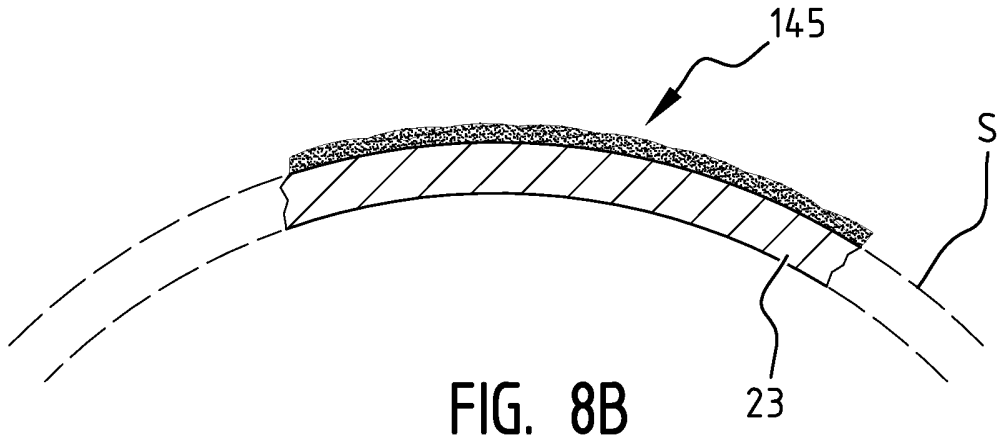

FIG. 8B

SAMENWERKINGSVERDRAG (PCT)

RAPPORT BETREFFENDE NIEUWHEIDSONDERZOEK VAN INTERNATIONAAL TYPE

IDENTIFICATIE VAN DE NATIONALE AANVRAGE	KENMERK VAN DE AANVRAGER OF VAN DE GEMACHTIGDE
	2X/2LL95/47
Nederlands aanvraag nr. **2008206**	Indieningsdatum **31-01-2012**
	Ingeroepen voorrangsdatum

Aanvrager (Naam)

Bluemarine Offshore Yard Service B.V.

Datum van het verzoek voor een onderzoek van internationaal type	Door de Instantie voor Internationaal Onderzoek aan het verzoek voor een onderzoek van internationaal type toegekend nr.
19-05-2012	**SN 58151**

I. CLASSIFICATIE VAN HET ONDERWERP (bij toepassing van verschillende classificaties, alle classificatiesymbolen opgeven)

Volgens de internationale classificatie (IPC)

B05B13/04 **F16L13/02** **F16L58/18**

II. ONDERZOCHTE GEBIEDEN VAN DE TECHNIEK

Onderzochte minimumdocumentatie

Classificatiesysteem	Classificatiesymbolen
IPC	**F16L** **B05B**

Onderzochte andere documentatie dan de minimum documentatie, voor zover dergelijke documenten in de onderzochte gebieden zijn opgenomen

III. ☐ **GEEN ONDERZOEK MOGELIJK VOOR BEPAALDE CONCLUSIES** (opmerkingen op aanvullingsblad)

IV. ☐ **GEBREK AAN EENHEID VAN UITVINDING** (opmerkingen op aanvullingsblad)

ONDERZOEKSRAPPORT BETREFFENDE HET RESULTAAT VAN HET ONDERZOEK NAAR DE STAND VAN DE TECHNIEK VAN HET INTERNATIONALE TYPE

Nummer van het verzoek om een onderzoek naar de stand van de techniek
NL 2008206

A. CLASSIFICATIE VAN HET ONDERWERP
INV. B05B13/04 F16L13/02 F16L58/18
ADD.

Volgens de Internationale Classificatie van octrooien (IPC) of zowel volgens de nationale classificatie als volgens de IPC.

B. ONDERZOCHTE GEBIEDEN VAN DE TECHNIEK

Onderzochte miminum documentatie (classificatie gevolgd door classificatiesymbolen)
F16L B05B

Onderzochte andere documentatie dan de mimimum documentatie, voor dergelijke documenten, voor zover dergelijke documenten in de onderzochte gebieden zijn opgenomen

Tijdens het onderzoek geraadpleegde elektronische gegevensbestanden (naam van de gegevensbestanden en, waar uitvoerbaar, gebruikte trefwoorden)
EPO-Internal, WPI Data

C. VAN BELANG GEACHTE DOCUMENTEN

Categorie °	Geciteerde documenten, eventueel met aanduiding van speciaal van belang zijnde passages	Van belang voor conclusie nr.
X	FR 2 723 006 A1 (GTS ISOPIPE SA [FR]) 2 februari 1996 (1996-02-02) * bladzijde 6 - bladzijde 8; figuur 4 * -----	1-16
X	US 4 007 705 A (SHERER C RICHARD ET AL) 15 februari 1977 (1977-02-15) * kolom 1; figuren 1-12 * -----	1,2, 11-14, 16-18
X	EP 0 000 808 A1 (WALTON MOLE CO [GB]) 21 februari 1979 (1979-02-21) * kolom 5 - kolom 7; figuren 1-4 * -----	1,2, 11-14
A	WO 2010/130345 A1 (SAIPEM SPA [IT]; NARDO MARCO [IT]) 18 november 2010 (2010-11-18) * figuren 1-8 * -----	6,13-15

☐ Verdere documenten worden vermeld in het vervolg van vak C.

☒ Leden van dezelfde octrooifamilie zijn vermeld in een bijlage

° Speciale categorieën van aangehaalde documenten

"A" niet tot de categorie X of Y behorende literatuur die de stand van de techniek beschrijft

"D" in de octrooiaanvrage vermeld

"E" eerdere octrooi(aanvrage), gepubliceerd op of na de indieningsdatum, waarin dezelfde uitvinding wordt beschreven

"L" om andere redenen vermelde literatuur

"O" niet-schriftelijke stand van de techniek

"P" tussen de voorrangsdatum en de indieningsdatum gepubliceerde literatuur

"T" na de indieningsdatum of de voorrangsdatum gepubliceerde literatuur die niet bezwarend is voor de octrooiaanvrage, maar wordt vermeld ter verheldering van de theorie of het principe dat ten grondslag ligt aan de uitvinding

"X" de conclusie wordt als niet nieuw of niet inventief beschouwd ten opzichte van deze literatuur

"Y" de conclusie wordt als niet inventief beschouwd ten opzichte van de combinatie van deze literatuur met andere geciteerde literatuur van dezelfde categorie, waarbij de combinatie voor de vakman voor de hand liggend wordt geacht

"&" lid van dezelfde octrooifamilie of overeenkomstige octrooipublicatie

Datum waarop het onderzoek naar de stand van de techniek van internationaal type werd voltooid	Verzenddatum van het rapport van het onderzoek naar de stand van de techniek van internationaal type
31 oktober 2012	
Naam en adres van de instantie European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	**De bevoegde ambtenaar** Kepka, Maciek

1

ONDERZOEKSRAPPORT BETREFFENDE HET RESULTAAT VAN HET ONDERZOEK NAAR DE STAND VAN DE TECHNIEK VAN HET INTERNATIONALE TYPE

Informatie over leden van dezelfde octrooifamilie

Nummer van het verzoek om een onderzoek naar de stand van de techniek: NL 2008206

In het rapport genoemd octrooigeschrift	Datum van publicatie	Overeenkomend(e) geschrift(en)		Datum van publicatie
FR 2723006	A1 02-02-1996	AT	184815 T	15-10-1999
		BR	9506288 A	12-08-1997
		CO	4600691 A1	08-05-1998
		DE	69512369 D1	28-10-1999
		DE	69512369 T2	23-03-2000
		DK	721382 T3	03-04-2000
		EP	0721382 A1	17-07-1996
		ES	2138746 T3	16-01-2000
		FI	961400 A	27-03-1996
		FR	2723006 A1	02-02-1996
		GR	3032062 T3	31-03-2000
		NO	960926 A	07-03-1996
		WO	9603222 A1	08-02-1996
US 4007705	A 15-02-1977	GEEN		
EP 0000808	A1 21-02-1979	DE	2861667 D1	15-04-1982
		DK	316378 A	17-01-1979
		EP	0000808 A1	21-02-1979
		IE	47522 B1	18-04-1984
		IT	1097951 B	31-08-1985
		JP	54021061 A	16-02-1979
		NO	782451 A	17-01-1979
		US	4205694 A	03-06-1980
WO 2010130345	A1 18-11-2010	AU	2010246717 A1	08-12-2011
		CA	2759452 A1	18-11-2010
		EA	201101594 A1	30-04-2012
		EP	2427684 A1	14-03-2012
		US	2012037297 A1	16-02-2012
		WO	2010130345 A1	18-11-2010

Agentschap NL
Ministerie van Economische Zaken,
Landbouw en Innovatie

WRITTEN OPINION

File No.	Filing date *(day/month/year)*	Priority date *(day/month/year)*	Application No.
SN58151	31.01.2012		NL2008206

International Patent Classification (IPC)
INV. B05B13/04 F16L13/02 F16L58/18

Applicant
Bluemarine Offshore Yard Service B.V.

This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☒ Box No. VII Certain defects in the application
- ☐ Box No. VIII Certain observations on the application

Examiner
Kepka, Maciek

Application number

WRITTEN OPINION

NL2008206

Box No. I Basis of this opinion

1. This opinion has been established on the basis of the latest set of claims filed before the start of the search.

2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the application and necessary to the claimed invention, this opinion has been established on the basis of:

   a. type of material:

   ☐ a sequence listing

   ☐ table(s) related to the sequence listing

   b. format of material:

   ☐ on paper

   ☐ in electronic form

   c. time of filing/furnishing:

   ☐ contained in the application as filed.

   ☐ filed together with the application in electronic form.

   ☐ furnished subsequently for the purposes of search.

3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

4. Additional comments:

Box No. V Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty	Yes:	Claims	5-10, 15, 17, 18
	No:	Claims	1-4, 11-14, 16
Inventive step	Yes:	Claims	
	No:	Claims	1-18
Industrial applicability	Yes:	Claims	1-18
	No:	Claims	

2. Citations and explanations

see separate sheet

Application number
NL2008206

WRITTEN OPINION

Box No. VII Certain defects in the application

see separate sheet

Re Item V

Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

Reference is made to the following documents:

D1 FR 2 723 006 A1 (GTS ISOPIPE SA [FR]) 2 februari 1996 (1996-02-02)

D2 US 4 007 705 A (SHERER C RICHARD ET AL) 15 februari 1977 (1977-02-15)

D3 EP 0 000 808 A1 (WALTON MOLE CO [GB]) 21 februari 1979 (1979-02-21)

D4 WO 2010/130345 A1 (SAIPEM SPA [IT]; NARDO MARCO [IT]) 18 november 2010 (2010-11-18)

INDEPENDENT CLAIMS

1 The present application does not meet the criteria of patentability, because the subject-matter of claim 1 and 16 is not new, the reasons for this are as follows:

1.1 D1 discloses the subject matter of claim 1 (the references in parentheses applying to this document):

1. Inrichting voor het coaten van een opperviak van een opening in de coating van een pijpleiding, waarbij het opperviak een lerigte langs de centrale langsaslijn van de pijpleiding heeft en een breedte van ten minste een gedeelte van de omtrek van de pijpleiding (p.7, l.36-37), waarbij de inrichting omvat:

- een gestel (13, fig.4);

- een spuitmondondersteuningselement dat een aantal spuitmonden ondersteunt (p.6, l.34-36; 6, fig.4);

- een lineair bewegingsmechanisme dat is geconfigureerd voor het transleren van het spuitmondondersteuningselement ten opzichte van het gestel en parallel aan een langsaslijn van het gestel (p.7, l.31-32); en

- ondersteuningsorganen die zijn geconfigureerd voor het stationair ten opzichte van de pijpleiding arrangeren van het gestel waarbij de langsaslijri van het gestel samenvalt met de centrale langsaslijn van de pijpleiding (13, fig.4);

zodanig dat bij het transleren van het spuitmondondersteuningselement ten opzichte van het gestel door middel van het lineaire bewegingsmechanisme, de spuitmonclen verplaatsbaar zijn langs de lengte van het oppervlak met de spuitmonden gericht in de richting van het oppervlak (p.7, l.31-32).

1.2 The above argument applies mutatis mutandis to the subject matter of claim 16.

1.3 The subject matter of claims 1 and 16 is also disclosed in D2 (see passages cited in the search report).

DEPENDENT CLAIMS

2 Dependent claims 2-15, 17, 18 do not contain any features which, in combination with the features of any claim to which they refer, meet the requirements of novelty and/or inventive step, see D1-D4

Re Item VII

Certain defects in the application

3 Relevant background art such as disclosed in D1-D4 is not mentioned in the description, nor are such documents identified therein.