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(54) **MOVING WALKWAY WITH A DRUM MOTOR**

(57) The invention relates to transporting and moving systems in general and particularly to systems for moving and transporting people and more particularly to moving walkways and to moving walkway installations. The moving walkway (1), (2), (4), (5) according to the present invention comprises a people-conveying device (14), (41), (51), said people-conveying device (14), (41), (51) forming an endless loop and having a substantially continuous planar conveying surface (15), and an at least one drum motor (3), (16), (17), (44), (45), (53), (54) comprising a pulley drum (33) supported by an axle (34), said pulley drum (33) being arranged to rotate around the stationary axle (34), in which people-conveying device (14), (41), (51) said at least one drum motor (3), (16), (17), (44), (45), (53), (54) is arranged to move said people-conveying device (14), (41), (51) in said endless loop.

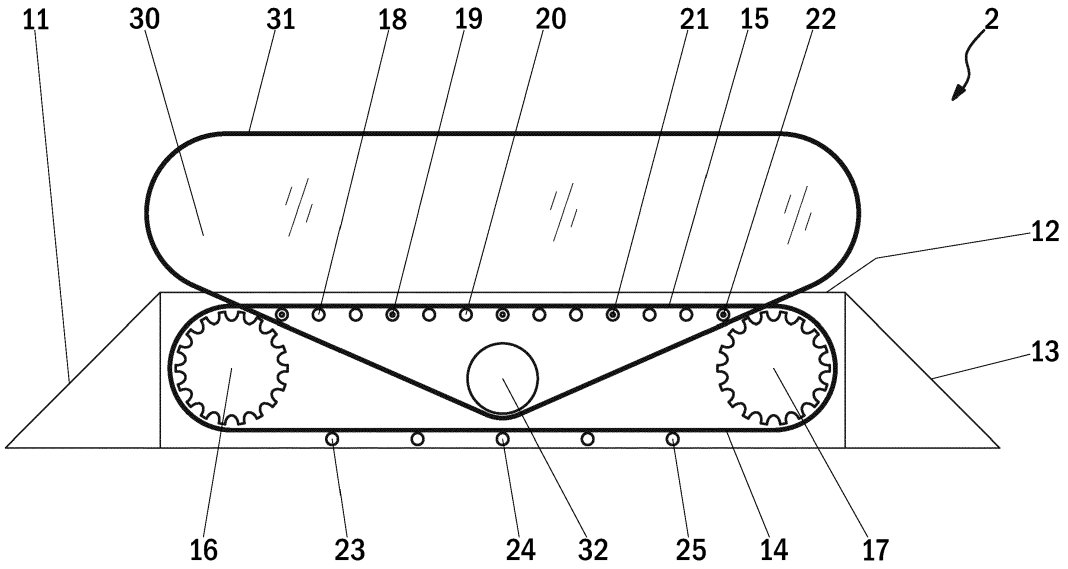

Fig. 2

EP 3 604 198 A1

Description

FIELD OF THE INVENTION

[0001] The invention relates to transporting and moving systems in general and particularly to systems for moving and transporting people and more particularly to moving walkways and to moving walkway installations.

BACKGROUND OF THE INVENTION

[0002] Moving walkways are moving systems where people are transported in horizontal direction. Moving walkways are especially suitable for flight terminals and railway stations there can be long transfer distances within a building, between different buildings and outside.

[0003] Like escalators, also moving walkways typically have a people-conveying device, which is supported on a frame of the people-conveying device. A traveling platform usually comprises a conveying section in which the conveying elements are visible and accessible to a passenger when they are in this section, in which case a person can move on them and in which section the conveying elements are moved in a first direction.

[0004] When installing moving walkways, the moving walkways typically have to be built into the floor level, which is expensive, time-consuming and complex. A typical prior art solution for a moving walkways requires a lot of space in the vertical direction and in some cases this required space is not available.

[0005] In some moving walkway installations, the moving walkways have to be built on top of the floor level. This typically makes the moving walkway installations too tall, which is not desirable and simply takes too much space.

[0006] One drawback of the prior art moving walkway installations is that the moving walkways have complex configurations and therefore take too much space.

[0007] Another drawback of the prior art moving walkway installations is that the moving walkways have complex configurations and thereby making the moving walkway installations complex to install.

[0008] Yet another drawback of the prior art moving walkway installations is that the complex configuration of the moving walkways also brings about complexness also to operation, use and maintenance.

[0009] The prior art moving walkway installations, which are built on top of the floor level are too tall, structurally complex configurations and are complex to install and somewhat troublesome to maintain due to the structural complexity.

BRIEF DESCRIPTION OF THE INVENTION

[0010] The object of the invention is to introduce a structurally simple moving walkway structure, which can also be built on top of the floor level without taking too much space, and which moving walkway structure provides a straightforward solution for installation, operation and maintenance.

[0011] It is brought forward a new moving walkway comprising a people-conveying device, said people-conveying device forming an endless loop and having a substantially continuous planar conveying surface, and an at least one drum motor comprising a pulley drum supported by an axle, said pulley drum being arranged to rotate around the stationary axle wherein said at least one drum motor is arranged to move said people-conveying device in said endless loop. Hereby, one or more of the above-mentioned advantages and/or objectives are achieved. These advantages and/or objectives are further facilitated with the additional preferred features and/or steps described in the following.

[0012] In a preferred embodiment, said people-conveying device comprises an endless band of successive conveying elements forming an endless loop, said conveying elements each having a conveying surface for carrying the load to be transported through said moving walkway, which conveying surfaces together form a substantially continuous planar conveying surface.

[0013] In a preferred embodiment, said moving walkway comprises a chain for conveying said conveying elements; and said at least one drum motor comprises chain sprockets for driving said chain.

[0014] In a preferred embodiment, said conveying elements are of metal, aluminium, plastic or of composite material.

[0015] In an alternative preferred embodiment, said people-conveying device comprises a people-conveying belt, said people-conveying belt forming an endless loop and having a substantially continuous planar conveying surface.

[0016] In a preferred embodiment, at least one drum motor comprises a guiding groove or guiding crown matching a crown or a groove of said people-conveying belt.

[0017] In another alternative preferred embodiment, said people-conveying belt is of rubber, carbon fiber, polyurethane, plastic or of composite material.

[0018] In a preferred embodiment, said moving walkway comprises support rollers arranged to support said people-conveying device.

[0019] In a preferred embodiment, said support rollers comprise guiding support rollers arranged for guiding said people-conveying device, said guiding support rollers comprising a guiding groove or guiding crown matching a crown or a groove of said people-conveying device.

[0020] In a preferred embodiment, the total height of said moving walkway is 250-500 mm, preferably 300-400 mm.

[0021] In a preferred embodiment, said moving walkway comprises handrails and an at least one drum motor arranged to move said handrails in an endless loop.

[0022] In a preferred embodiment, the total length of said moving walkway is 3-100 m, preferably 5-50 m.

[0023] In a preferred embodiment, said moving walk-

way comprises an entry section and a departing section.

[0024] In a preferred embodiment, said moving walkway comprises a control unit and/or a connection unit arranged at least partially within said entry section and/or said departing section.

[0025] It is also brought forward a new moving walkway installation installed on top of floor level, wherein said installation comprises a moving walkway comprising a people-conveying device, said people-conveying device forming an endless loop and having a substantially continuous planar conveying surface, and an at least one drum motor comprising a pulley drum supported by an axle, said pulley drum being arranged to rotate around the stationary axle wherein said at least one drum motor is arranged to move said people-conveying device in said endless loop.

BRIEF DESCRIPTION OF THE DRAWINGS

[0026] In the following, the present invention will be described in more detail by way of example and with reference to the attached drawings, in which:

Figure 1 illustrates a conceptual diagrammatic view of a moving walkway according to one embodiment of the present invention.

Figure 2 illustrates a conceptual diagrammatic view of a moving walkway according to another embodiment of the present invention.

Figure 3 illustrates a front view of a drum motor according to a third embodiment of the present invention.

Figure 4 illustrates a conceptual perspective view of a moving walkway according to a fourth embodiment of the present invention.

Figure 5 illustrates a conceptual perspective view of a moving walkway according to a fifth embodiment of the present invention.

[0027] The foregoing aspects, features and advantages of the invention will be apparent from the drawings and the detailed description related thereto.

DETAILED DESCRIPTION

[0028] Figure 1 illustrates a conceptual diagrammatic view of a moving walkway according to one embodiment of the present invention. The presented moving walkway 1 comprises an inclined entry section 11, a conveying section 12 and a declined departing section 13. The conveying section 12 of the moving walkway 1 according to the presented embodiment also comprises a people-conveying device 14, said people-conveying device 14 forming an endless loop and having a substantially continuous, planar conveying surface 15. Said conveying surface 15 is visible and accessible to a passenger and on which conveying surface 15 a person can moved in a first direction. The conveying section 12 of the moving walkway 1 according to the presented embodiment also comprises an at least one traction motor 16, 17 arranged to move said people-conveying device 14 in said endless loop. In the present invention said at least one traction motor 16, 17 is realized with an at least one drum motor 16, 17. The presented moving walkway 1 may also comprise a control unit and/or a connection unit arranged at least partially within said entry section 11 and/or said departing section 13. The presented moving walkway 1 may be installed as on top of floor level moving walkway installation.

[0029] The people-conveying device 14 of the present embodiment may comprise a people-conveying belt 14 forming an endless loop and having a substantially continuous, planar conveying surface 15. Alternatively, the people-conveying device of the present invention may comprise a plurality of conveying elements together forming an endless loop and having a substantially continuous, planar conveying surface. Said an at least one drum motor 16, 17 of the present embodiment may comprise a three-phase AC induction motor, a drive wheel, a gearbox and a brake.

[0030] The moving walkway 1 according to the presented embodiment may also comprise support rollers 18-25 arranged to support said people-conveying device 14. The support rollers 18-25 may comprise support rollers 18-22 supporting the planar conveying surface 15 of said people-conveying device 14. The support rollers 18-25 may also comprise support rollers 23-25 supporting the returning people-conveying device 14 in the endless loop. Furthermore, some of the support rollers 18-25 may be guiding support rollers 19, 21, 22 for guiding said people-conveying device 14. Said guiding support rollers 19, 21, 22 may comprise a guiding groove or guiding crown matching a crown or a groove of said people-conveying device 14.

[0031] Figure 2 illustrates a conceptual diagrammatic view of a moving walkway according to another embodiment of the present invention. The presented moving walkway 2 comprises an inclined entry section 11, a conveying section 12 and a declined departing section 13. The conveying section 12 of the moving walkway 2 according to the presented another embodiment also comprises a people-conveying device 14, said people-conveying device 14 forming an endless loop and having a substantially continuous, planar conveying surface 15. The conveying section 12 of the moving walkway 2 according to the presented another embodiment also comprises an at least one traction motor 16, 17 arranged to move said people-conveying device 14 in an endless loop. In the present invention said at least one traction motor 16, 17 is realized with an at least one drum motor 16, 17. The presented moving walkway 2 may also comprise a control unit and/or a connection unit arranged at least partially within said entry section 11 and/or said departing section 13. The presented moving walkway 2 may be installed as on top of floor level moving walkway installation. The people-conveying device 14 of the

present another embodiment may comprise a people-conveying belt 14 forming an endless loop and having a substantially continuous, planar conveying surface 15. Alternatively, the people-conveying device of the present invention may comprise a plurality of conveying elements together forming an endless loop and having a substantially continuous, planar conveying surface. Said an at least one drum motor 16, 17 of the present embodiment may comprise a three-phase AC induction motor, a drive wheel, a gearbox and a brake.

[0032] The moving walkway 2 according to the presented another embodiment may also comprise support rollers 18-25 arranged to support said people-conveying device 14. The support rollers 18-25 may comprise support rollers 18-22 supporting the planar conveying surface 15 of said people-conveying device 14. The support rollers 18-25 may also comprise support rollers 23-25 supporting the returning people-conveying device 14 in the endless loop. Furthermore, some of the support rollers 18-25 may be guiding support rollers 19, 21, 22 for guiding said people-conveying device 14. Said guiding support rollers 19, 21, 22 may comprise a guiding groove or guiding crown matching a crown or a groove of said people-conveying device 14.

[0033] The moving walkway 2 according to the presented another embodiment may also comprise balustrades 30 and handrails 31. Said balustrades 30 may be full glass balustrades 30. Only one balustrade 30 and handrail 31 is shown in Figure 2. The moving walkway 2 according to the presented another embodiment also comprises an at least one drum motor 32 arranged to move said handrails 31 in an endless loop.

[0034] Figure 3 illustrates a front view of a drum motor according to a third embodiment of the present invention. The presented drum motor 3 comprises a pulley drum 33 supported by an axle 34. In the drum motor 3 according to the present invention said pulley drum 33 is arranged to rotate around the stationary axle 34. The drum motor 3 according to the presented third embodiment also comprises a terminal box 35. Said drum motor 3 of the present embodiment may also comprise a three-phase AC induction motor, a drive wheel, a gearbox and a brake.

[0035] Figure 4 illustrates a conceptual perspective view of a moving walkway according to a fourth embodiment of the present invention. The presented moving walkway 4 according to the presented fourth embodiment comprises a people-conveying device 41. Said people-conveying device 41 comprises an endless band of successive conveying elements 42, 43 forming an endless loop. Said conveying elements 42, 43 each have a conveying surface for carrying the load to be transported through the moving walkway 4, which together form a substantially continuous planar conveying surface.

[0036] In Figure 4 only two conveying elements 42, 43 are shown of said endless band of successive conveying elements 42, 43 forming an endless loop. Said conveying elements 42, 43 may be of metal, aluminium, plastic or of composite material. Said conveying elements 42, 43 may have a length of 10-200 mm; preferably a length of 50-100 mm. Said successive conveying elements 42, 43 form a substantially continuous, planar conveying surface of the moving walkway 4.

[0037] The moving walkway 4 according to the presented fourth embodiment also comprises an at least one traction motor 44, 45 arranged to drive and move said people-conveying device 41 in an endless loop. In the present invention said at least one traction motor 44, 45 is realized with an at least one drum motor 44, 45. The moving walkway 4 according to the presented fourth embodiment may also comprise a chain for conveying said conveying elements 42, 43. The at least one drum motor 44, 45 may comprise chain sprockets 46, 47 for driving a chain conveying said conveying elements 42, 43. Said chain sprockets 46, 47 may have a diameter of 150-300 mm. Said chain conveying said conveying elements 42, 43 is not presented in Figure 4. The moving walkway 4 according to the presented fourth embodiment may also comprise balustrades 48 and handrails 49. Said balustrades 48 may be full glass balustrades 48. Only one balustrade 48 and handrail 49 is shown in Figure 4. The moving walkway 4 according to the presented fourth embodiment also comprises an at least one drum motor 50 arranged to move said handrails 49 in an endless loop.

[0038] Said conveying elements 42, 43 have small length, so that the endless band of said people-conveying device 41 may be turned 180 degrees to the opposite direction driven by said at least one drum motor 44, 45. The total height of the moving walkway 4 according to the presented fourth embodiment may be 250-500 mm, preferably 300-400 mm. Said an at least one drum motor 44, 45 of the present embodiment may comprise a three-phase AC induction motor, a drive wheel, a gearbox and a brake. The total length of the moving walkway 4 according to the presented fourth embodiment may be 3-100 m, preferably 5-50 m. The presented moving walkway 4 may be installed as on top of floor level moving walkway installation.

[0039] Figure 5 illustrates a conceptual perspective view of a moving walkway according to a fifth embodiment of the present invention. The presented moving walkway 5 according to the presented fifth embodiment comprises a people-conveying device 51. Said people-conveying device 51 comprises a people-conveying belt 52 forming an endless loop and having a substantially continuous, planar conveying surface of the moving walkway 5. Said people-conveying belt 52 may be of rubber, carbon fiber, polyurethane, plastic or of composite material. Said people-conveying belt 52 forming an endless loop is only partially presented in Figure 5.

[0040] The moving walkway 5 according to the presented fifth embodiment also comprises an at least one traction motor 53, 54 arranged to drive and move said people-conveying belt 52 in an endless loop. In the present invention said at least one traction motor 53, 54 is realized with an at least one drum motor 53, 54. The at least one drum motor 53, 54 may drive the people-

conveying belt 52 directly with the drum/drums of said at least one drum motor 53, 54. The surface of said at least one drum motor 54 may be even. Alternatively the surface of said at least one drum motor 54 may comprise ridges, notches or teeth.

[0041] Said at least one drum motor 54 may comprise a guiding groove 55 or guiding crown matching a crown or a groove of said people-conveying belt 52. The tightening of said people-conveying belt 52 may adjusted by moving the positon of said at least one drum motor 53, 54.

[0042] The moving walkway 5 according to the presented another embodiment may also comprise balustrades 56 and handrails 57. Said balustrades 56 may be full glass balustrades 56. Only one balustrade 56 and handrail 57 is shown in Figure 5. The moving walkway 5 according to the presented another embodiment also comprises an at least one drum motor 58 arranged to move said handrails 57 in an endless loop.

[0043] Said endless band of said people-conveying belt 52 may be turned 180 degrees to the opposite direction driven by said at least one drum motor 53, 54. The total height of the moving walkway 5 according to the presented fifth embodiment may be 250-500 mm, preferably 300-400 mm. Said an at least one drum motor 53, 54 of the present embodiment may comprise a three-phase AC induction motor, a drive wheel, a gearbox and a brake. The total length of the moving walkway 5 according to the presented fifth embodiment may be 3-100 m, preferably 5-50 m. The presented moving walkway 5 may be installed as on top of floor level moving walkway installation.

[0044] The moving walkway 5 according to the presented another embodiment may also comprise support rollers arranged to support said people-conveying belt 52. Said support rollers may be arranged in intervals 200-500 mm apart from one another.

[0045] Said support rollers may comprise support rollers supporting the planar conveying surface of said people-conveying belt 52 and support rollers supporting the returning people-conveying belt 52 in the endless loop. Furthermore, some of said support rollers may be guiding support rollers for guiding said people-conveying belt 52, said guiding support rollers comprising a guiding groove or guiding crown matching a crown or a groove of said people-conveying belt 52.

[0046] The moving walkway according to the present invention provides a simple moving walkway configuration without taking too much space. The moving walkway according to the present invention is especially suited to be installed as on top of floor level moving walkway installation. With the help of the moving walkway according to the present invention the installation and the process of installing the moving walkway is simplified and faster when compared to prior art solutions.

[0047] With the help of the moving walkway according to the present invention the operation of the moving walkway is easier. Also the maintenance of the moving walkway according to the present invention is easier due to the simple moving walkway configuration.

[0048] The moving walkway according to the present invention can also be used in places with limited space due to the compact structure.

[0049] It is to be understood that the above description and the accompanying Figures are only intended to teach the best way known to the inventors to make and use the invention. It will be apparent to a person skilled in the art that the inventive concept can be implemented in various ways. The above-described embodiments of the invention may thus be modified or varied, without departing from the invention, as appreciated by those skilled in the art in light of the above teachings. It is therefore to be understood that the invention and its embodiments are not limited to the examples described above but may vary within the scope of the claims and their equivalents.

Claims

1. A moving walkway (1), (2), (4), (5) comprising:

   - a people-conveying device (14), (41), (51), said people-conveying device (14), (41), (51) forming an endless loop and having a substantially continuous planar conveying surface (15), and
   - an at least one drum motor (3), (16), (17), (44), (45), (53), (54) comprising a pulley drum (33) supported by an axle (34), said pulley drum (33) being arranged to rotate around the stationary axle (34),
   - wherein said at least one drum motor (3), (16), (17), (44), (45), (53), (54) is arranged to move said people-conveying device (14), (41), (51) in said endless loop.

2. A moving walkway (4) according to claim 1, wherein said people-conveying device (41) comprises an endless band of successive conveying elements (42), (43) forming an endless loop, said conveying elements (42), (43) each having a conveying surface for carrying the load to be transported through said moving walkway (4), which conveying surfaces together form a substantially continuous planar conveying surface.

3. A moving walkway (4) according to claim 2, wherein:

   - said moving walkway (4) comprises a chain for conveying said conveying elements (42), (43); and
   - said at least one drum motor (44), (45) comprises chain sprockets (46), (47) for driving said chain (34).

4. A moving walkway (4) according to claim 2 or to claim 3, wherein said conveying elements (42), (43) are of metal, aluminium, plastic or of composite material.

5. A moving walkway (1), (2), (5) according to claim 1, wherein said people-conveying device (14), (51) comprises a people-conveying belt (52), said people-conveying belt (52) forming an endless loop and having a substantially continuous planar conveying surface (15).

6. A moving walkway (1), (2), (5) according to claim 5, wherein at least one drum motor (3), (16), (17), (54) comprises a guiding groove (55) or guiding crown matching a crown or a groove of said people-conveying belt (52).

7. A moving walkway (1), (2), (5) according to claim 5 or to claim 6, wherein said people-conveying belt (52) is of rubber, carbon fiber, polyurethane, plastic or of composite material.

8. A moving walkway (1), (2), (5) according to any of the preceding claims 1, 5-7, wherein said moving walkway (1), (2), (5) comprises support rollers (18-25) arranged to support said people-conveying device (14), (51).

9. A moving walkway (1), (2), (5) according to claim 8, wherein said support rollers (18-25) comprise guiding support rollers (19), (21), (22) arranged for guiding said people-conveying device (14), said guiding support rollers (19), (21), (22) comprising a guiding groove or guiding crown matching a crown or a groove of said people-conveying device (14).

10. A moving walkway (1), (2), (4), (5) according to any of the preceding claims 1-9, wherein the total height of said moving walkway (1), (2), (4), (5) is 250-500 mm, preferably 300-400 mm.

11. A moving walkway (1), (2), (4), (5) according to any of the preceding claims 1-10, wherein said moving walkway (1), (2), (4), (5) comprises handrails (31), (49), (57) and an at least one drum motor (32), (50), (58) arranged to move said handrails (31), (49), (57) in an endless loop.

12. A moving walkway (1), (2), (4), (5) according to any of the preceding claims 1-11, wherein the total length of said moving walkway (1), (2), (4), (5) is 3-100 m, preferably 5-50 m.

13. A moving walkway (1), (2), (4), (5) according to any of the preceding claims 1-12, wherein said moving walkway (1), (2), (4), (5) comprises an entry section (11) and a departing section (13).

14. A moving walkway (1), (2), (4), (5) according to claim 13, wherein said moving walkway (1), (2), (4), (5) comprises a control unit and/or a connection unit arranged at least partially within said entry section (11) and/or said departing section (13).

15. A moving walkway installation installed on top of floor level, wherein said installation comprises a moving walkway (1), (2), (4), (5) according to any of the preceding claims 1-14.

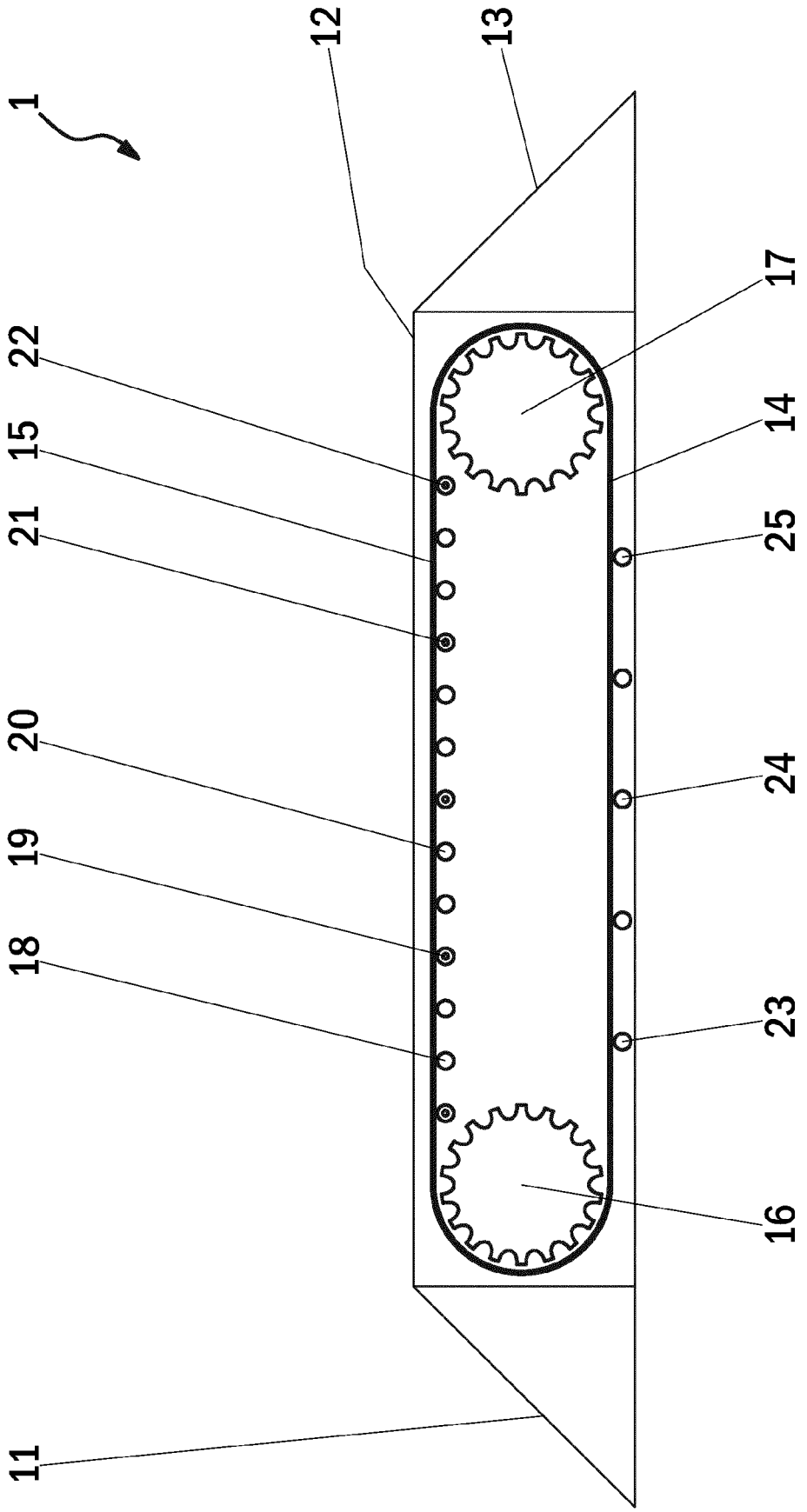

Fig. 1

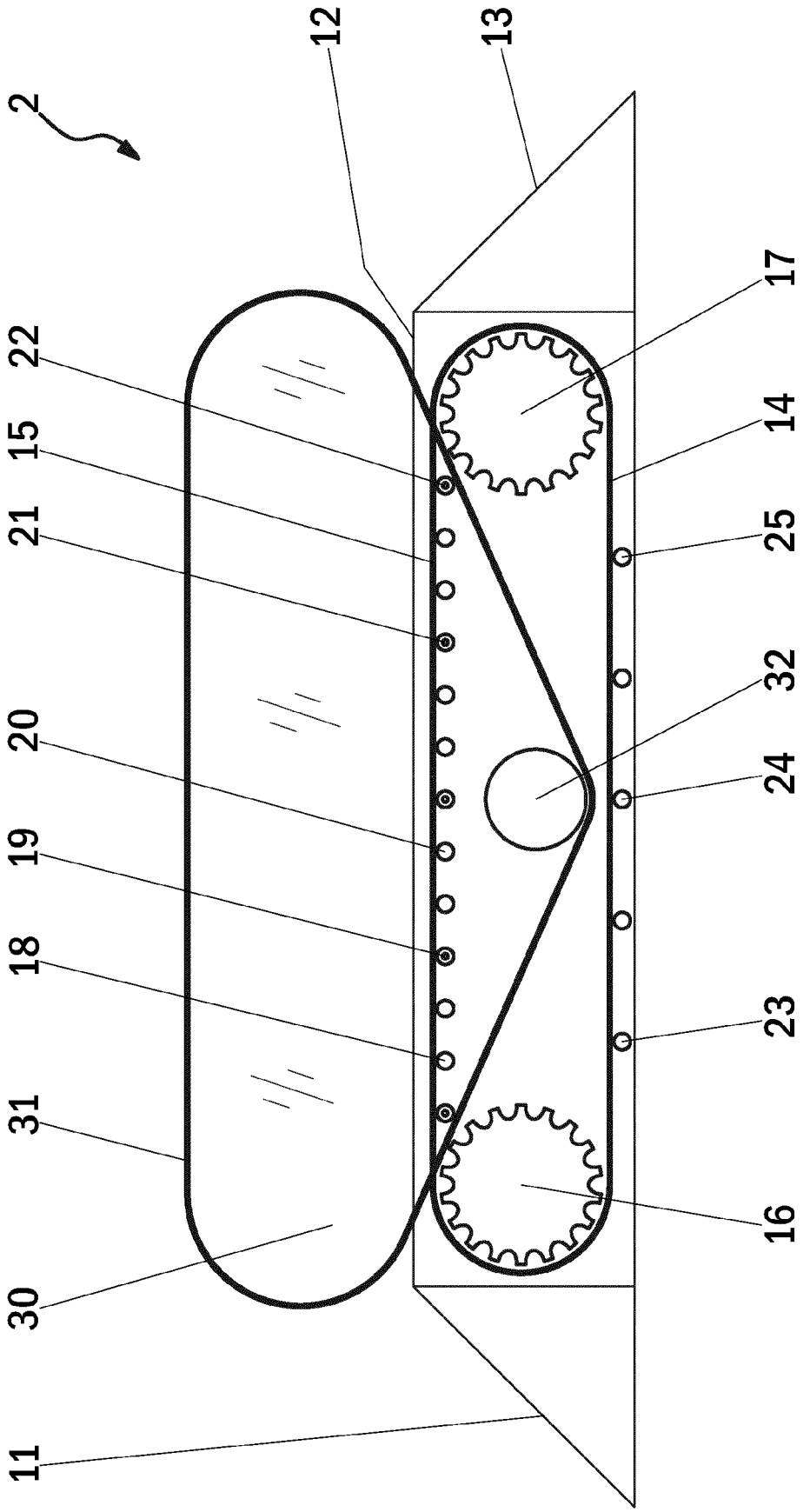

Fig. 2

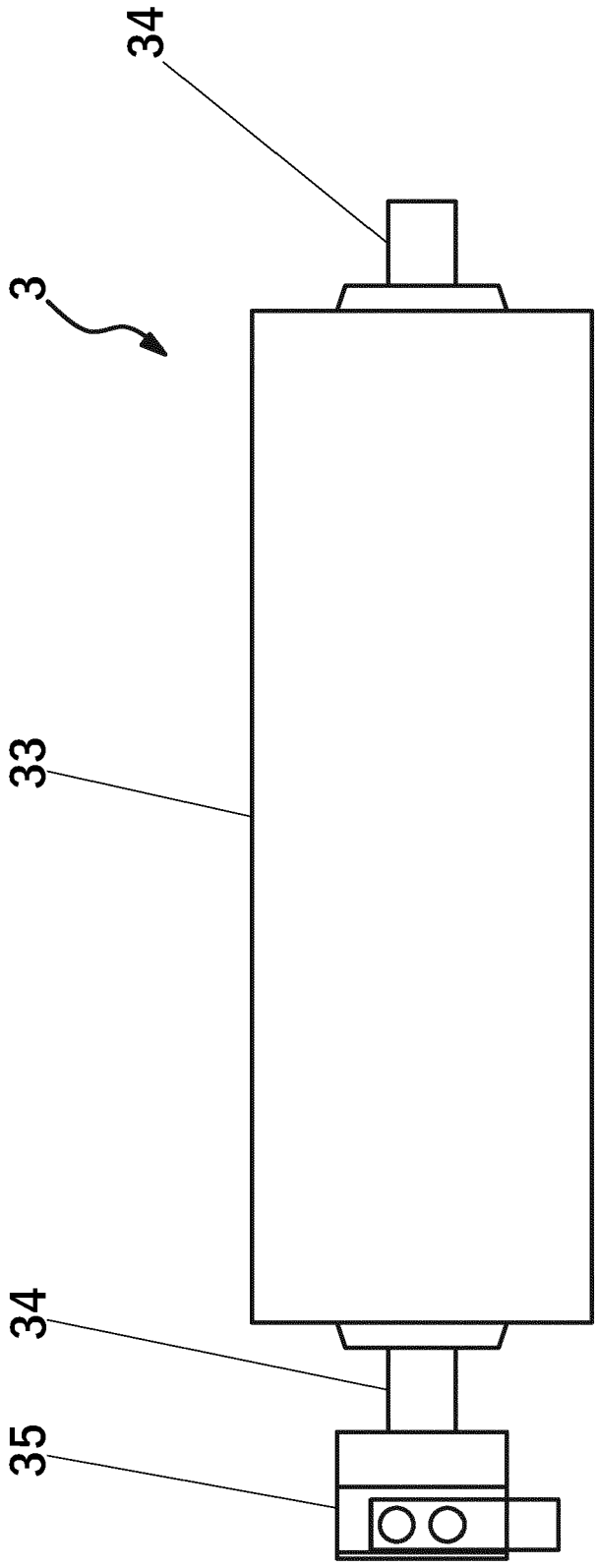

Fig. 3

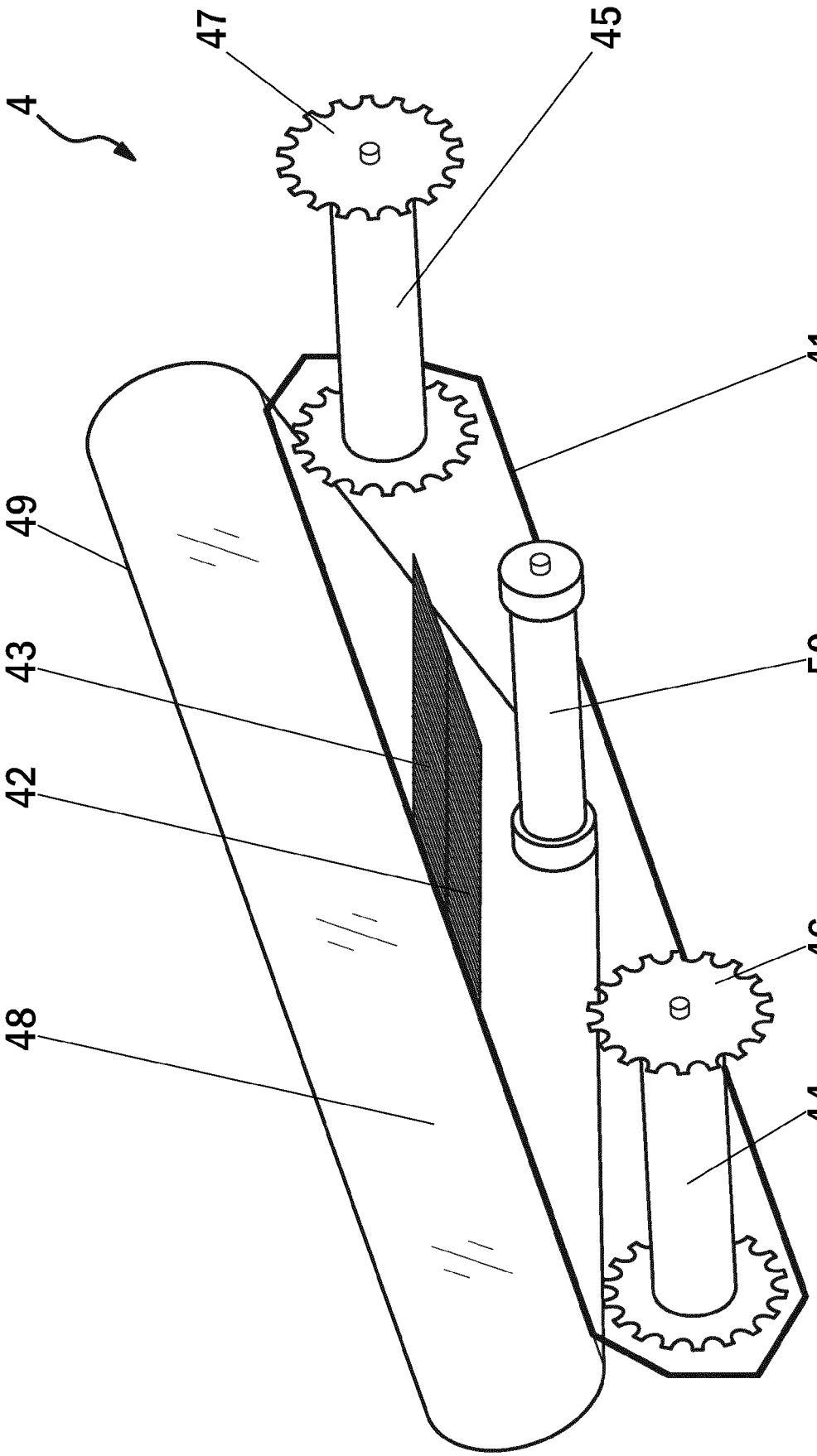

Fig. 4

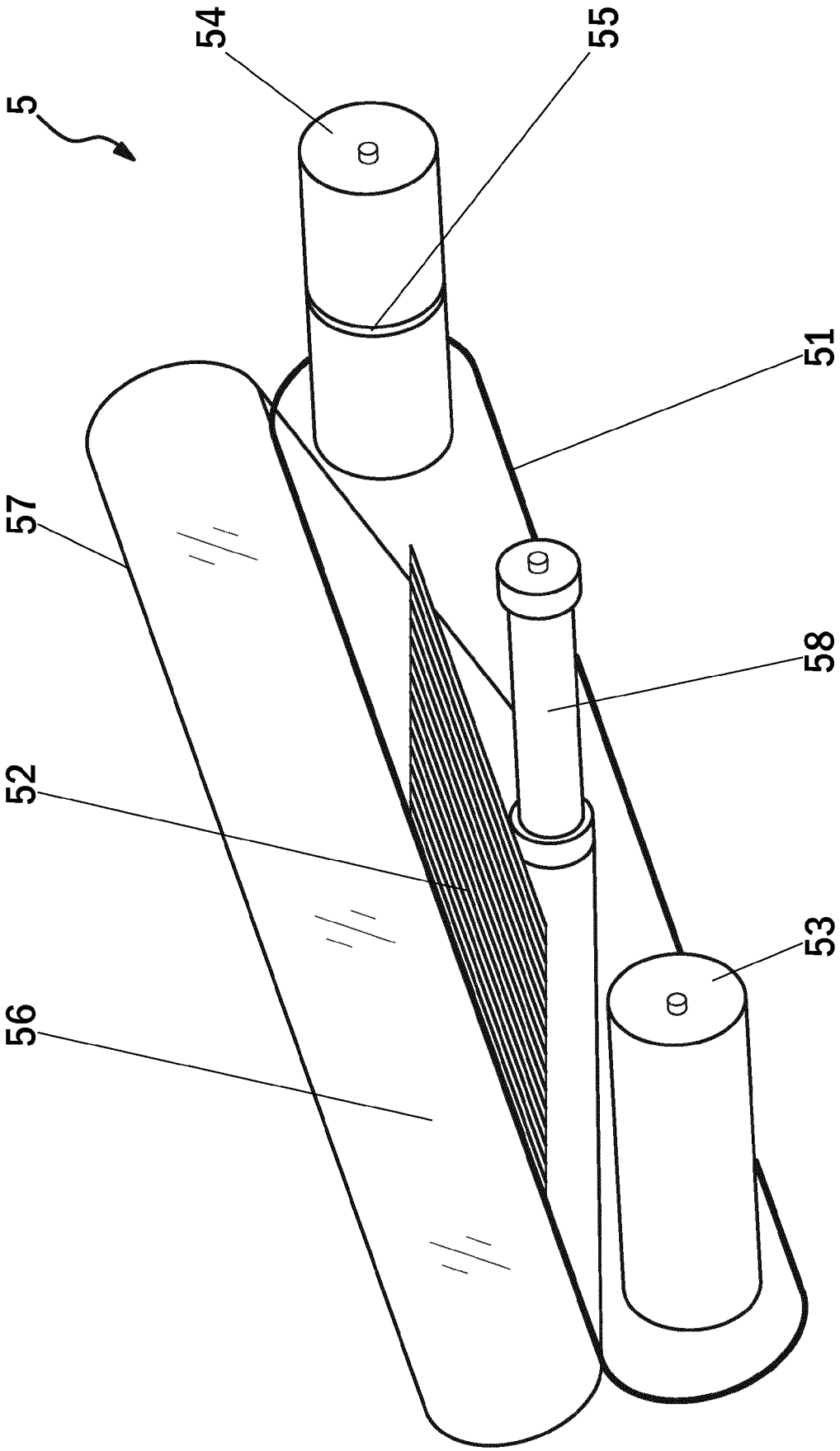

Fig. 5

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EUROPEAN SEARCH REPORT

Application Number
EP 18 18 7013

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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	20 February 2019	Lohse, Georg

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 18 18 7013

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