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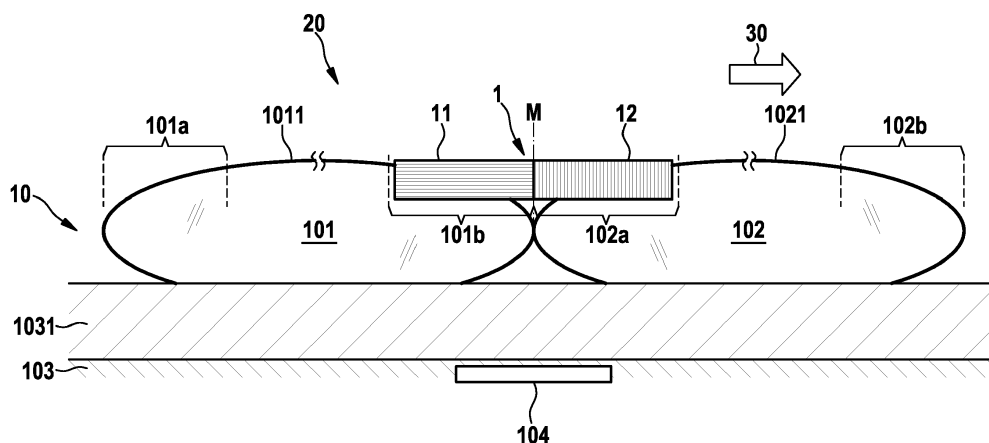
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(54) **A MOVING WALKING SYSTEM AND A HANDRAIL BRIDGING SYSTEM**

(57) The present invention refers to a moving walking system (10) comprising at least one walking platform (103) comprising a plurality of pallets (1031) and a handrail system (20) with at least two handrails in single line configuration. A first handrail (101) of the at least two handrails comprises a first end (101a) and a second end (101b), and a second handrail (102) of the at least two handrails comprises a first end (102a) and a second end (102b). The moving walking system (10) further comprises a bridging system (1) forming a bridge between the second end (101b) of the first handrail (101) and the first end (102a) of the second handrail (102), wherein the

bridging system (1) comprises a movable part (11) and a fixed part (12), wherein the movable part (11) and the fixed part (12) are themselves contactable to form the bridge between the first handrail (101) and the second handrail (102). The movable part (11) is arranged in front of the fixed part (12) with respect to a moving direction (30) of the handrail system (20), and is adapted to work as an anti-trap protection for users of the handrail system (20).

Besides, the invention refers to install a bridging system (1) to a moving walking system (10).



**Fig. 1**

## Description

**[0001]** The invention relates to moving walking systems, also known as moving walkways, such as those used in all manner of large-scale premises, for example, in airports and/or stations in which there is an aim to facilitate passenger movement. In particular, the invention refers to a moving walking system comprising at least one walking platform, at least a first and second handrail and a bridging system comprising at least one moveable part and at least one fixed part, wherein the bridging system is positioned in the vicinity of the handrail and is capable of affecting the operation of the moving walking system.

**[0002]** Handrails and handrail systems for moving walking systems are already known. EP 0 837 026 A1 discloses a handrail mechanism for a moving sidewalk, wherein the handrail includes a plurality of independent moving handrail portions. All portions are arranged without overlapping with one another, each being driven at a speed close to the driving speed of nearby treadboards. A plurality of bridging systems are disposed at jointing portions between adjoining moving handrail portions to guide passenger hands from one moving handrail portion to the next. An electric indicator is provided in the vicinity of the bridging system to alert passengers of its existence. This system attempts to alert passengers and users of the handrail system to any upcoming changes or variations in speed along the handrail path. In the event of an emergency however, for example, an item of passenger clothing gets caught between the bridging system and a handrail belt, there is no way to prevent it. Whilst the passenger may be made aware of the impending presence of a bridging system, there is still a need to improve moving walkways comprising several handrails.

**[0003]** It is thus an object of the invention, to improve passenger safety on moving walking systems, wherein the walking system comprises at least two consecutive handrails in single line configuration. This object is solved by a moving walking system according to claim 1, and a method according to claim 15. Preferred embodiments are the subject of the sub-claims and the description and are further illustrated in the drawings. The terms walking system and walkway refer to one and the same thing and are used interchangeably throughout the description and also comprise escalators.

**[0004]** The inventive walking system comprises at least one walking platform comprising a plurality of pallets and a handrail system with at least two handrails in single line configuration, particularly without overlapping with one another. A first handrail of the at least two handrails comprises a first end and a second end. A second handrail of the at least two handrails also comprises a first end and a second end. The inventive walking system also comprises a bridging system, wherein said bridging system forms a bridge between the second end of the first handrail and the first end of the second handrail. The bridging system of the inventive walking system comprises

a movable part and a fixed part. The movable part and the fixed part are themselves contactable to form the bridge between the first handrail and the second handrail. The movable part is arranged in front of the fixed part with respect to a moving direction of the handrail system. The movable part is adapted to work as an anti-trap protection for users of the handrail system. Without the movable part, entrapment, e.g. of a user's hand or the user's clothes may occur when a user's hand or a piece of clothing becomes stuck between the handrail and the bridging system at the entry of the belt into the bridging system. When this happens, the handrail belt does not stop and continues to operate as normal. Such entrapment can advantageously be prevented according to the invention by the movable part of the handrail system. The anti-trap protection is advantageously achieved by moving the movable part out of the entrapment zone, i.e., the area where entrapment may occur, especially the area where the handrail belt enters the bridging system. Preferably the movable part is rotatably moved out of said zone when a force, which exceeds a predetermined threshold, e.g. the force from a user's hand or a piece of clothing upon becoming stuck between the handrail belt and the moving part, is applied to the movable part in the direction of the moving direction of the moving part. The threshold can particularly be defined as a value between 1 N and 20 N, preferably between 5 N and 12 N (N: Newton). The moving direction of the movable part preferably follows the guidance of the handrail belt.

**[0005]** Preferably there is no gap or at least no gap between the movable part and the fixed part, so that there is no risk of entrapment in a gap between the movable part and the fixed part. Particularly there is no risk of such an entrapment if the gap is smaller than 3 mm, preferably the gap is smaller than 1 mm (mm: Millimeter). It is also preferred that the movable part and the handrail belt of the walking system do not contact each other since this would increase the friction within the system.

**[0006]** The walking system according to the invention has at least the advantage over the prior art in that it allows several handrails in a single line configuration to be easily connected. It also provides for improved passenger safety through the presence of the movable part, which advantageously helps to protect users or their clothes from entrapment when the handrail or the handrail belt respectively enters into the bridging system.

**[0007]** In a preferred embodiment, the moveable part is mounted to the first handrail at the second end of the first handrail and the fixed part is to the second handrail at the first end of the second handrail.

**[0008]** In a preferred embodiment the movable part of the bridging system is adapted to move along a guiding surface of the fixed part when a force, particularly a force which exceeds a predetermined threshold, is applied on the movable part in the direction of the moving direction of the moving part. Advantageously the guiding surface is essentially parallel to the belt of the first handrail covered by the bridging system. This provides for a smooth

operation of parts of the bridging system, thus augmenting its lifespan and reducing maintenance costs. Upon moving the movable part, the resulting freed space advantageously prevents user entrapment. Preferably the movable part is configured or mounted, respectively, in such a way that it is moved, preferably rotatably moved with the same speed as the driven handrail belt. According to another advantageous embodiment of the moving walking system, the movable part is moved, preferably rotatably moved, faster than the driven handrail, particularly at least 1,5 times faster than the driven handrail. This advantageously further reduces the risk of entrapment.

**[0009]** In another preferred embodiment, the movable part of the bridging system is adapted to move, preferably rotatably move, as a single part when a force, particularly a force which exceeds a predetermined threshold, is applied to the movable part in the direction of the moving direction of the moving part. This provides for a simple set-up of parts on the moving walking system and helps to reduce costs. If the movable part of the bridging system is adapted to move as a single part, this particularly means that the whole movable part is moved, preferably rotatably moved, relative to the fixed part. Advantageously the lower part of the movable part is at least partially covered by housing, preferably at the lower sides of the movable part in order to prevent entrapment or injury by the movable part.

**[0010]** In another preferred embodiment, the movable part of said bridging system can comprise several parts wherein the movable part is adapted to move, preferably rotatably move, as several parts when a force, particularly a force which exceeds a predetermined threshold, is applied on the movable part in the direction of the moving direction of the moving part. Advantageously the movable part comprises a lower fixed part and at least one movable part, wherein said at least one movable part moves towards the fixed part if a force, particularly a force which exceeds a predetermined threshold, acts on the movable part. In this embodiment, the movable part is collapsible, preferably in an accordion manner or in a telescopic manner. By having the option of a movable part comprising a single-part or several-parts, it advantageously allows for the bridging system to be adapted according to requirements, for example physical or aesthetic, of the moving walking system.

**[0011]** The walking system according to the invention can advantageously comprise a further system, wherein said further system is adapted to guide a handrail, in particular, a handrail belt. Said further system can comprise for example a balustrade, at least one friction wheel, or any other support mechanism which supports the handrail, preferably the handrail belt. In particular the further system supports the handrail/handrail belt at the newel. In a preferred embodiment, the movable part of the bridging system can be mounted to the further system. The movable part of the bridging system may also be in communication with the pallets of the moving walking system.

The term communication as used herein and throughout can refer to physical communication, i.e., in actual physical contact, or electronic communication, i.e., not in physical contact, but electronically contacted, or both, i.e., physically contacted and in electronic communication.

**[0012]** A first handrail of the walking system according to the invention, comprising a handrail belt, is preferably comprised within the further system, preferably within a first balustrade and a second handrail comprising a handrail belt, is preferably comprised within a second balustrade. One balustrade can also comprise at least both a first and second handrail.

**[0013]** In another preferred embodiment, the bridging system can also comprise a sensor which is adapted to sense any movement of the moveable part. This can be achieved by applying a force to the movable part, preferably, the movable part acts on the sensor when moving.

**[0014]** In another preferred embodiment, the walking system comprises a control unit for controlling the movement of the pallets, wherein the sensor is in communication with the control unit of the walking system. Once a force, particularly a force which exceeds a predetermined threshold, is applied to the movable part, it moves, preferably rotatably moves, downward or is decompressed respectively and activates the sensor.

**[0015]** In another preferred embodiment, the moving walking system comprises at least one control unit for controlling the moving walking system, wherein the sensor is in communication with the control unit, and wherein the control unit is adapted to stop the moving walking system if the sensor detects a movement, preferably a rotatable movement, of the movable part. Once the sensor is activated, the control unit can instruct at least a part or section of the moving walking system to stop, particularly the handrail of the moving walking system. Preferably this is at the section of moving walkway where the movable part has been activated. It is also preferred that when the sensor is activated, the pallets decelerate before stopping therefore avoiding any possible injury which could be caused to users by a sudden stop of the walking platform.

**[0016]** In another advantageous embodiment, the movable part of the bridging system works against a spring tension system when it is moved, preferably rotatably moved, by a force applied thereto, wherein said force exceeds a predetermined threshold. According to another advantageous embodiment the movable part can also work against a roller system, wherein said rollers are preferably positioned between the movable part and the fixed part and can be in communication with a sensor and/or control unit of the moving walking system. Preferably the movable part does not decompress at normal touch, i.e., when a passenger is holding onto the handrail. This advantageously controls the sensitivity of the movable part and prevents the handrail and walking system from being accidentally stopped and started. A force may be provided via a human hand, elbow, or any body part

that may be in contact with a handrail which is sufficient to cause the movable part to move, preferably rotatably move, and preferably activate the sensor and consequently the control unit. Indeed any object e.g., item of clothing, which can come into contact with the handrail, together with a force, can also be capable of causing the movable part to move, preferably rotatably move, and thus activate the sensor.

**[0017]** In another advantageous embodiment, the movable part is adapted to be moved back to its initial position when a force is no longer applied to the movable part in the moving direction of the movable part. Preferably, the movable part moves back via a spring tension system, or via a roller system. This movement can cause the control unit to deactivate and thus the walking system to re-start. The movable part can also be adapted to be moved back to its initial position by reducing the force to less than that of the predetermined threshold, e.g., to less than 1 N. The moving walking system according to the invention thus advantageously facilitates a passenger on the walking system in a case of emergency. It advantageously also provides the user with a means of communicating with the control unit and indeed the moving walking system as a whole, thereby significantly improving user safety.

**[0018]** In another advantageous embodiment, the movable part and the fixed part of the bridging system of the moving walkway, represent a touchable surface wherein the ratio of the touchable surface provided by the movable part and by the fixed part is less than 1:4 respectively preferably less than 1:10. The width of the movable part, that means the distance between the beginning of the bridging system and the beginning of the fixed part, is advantageously less than 200 mm, more preferably less than 150 mm, more preferably between 40 mm and 120 mm. The width of the fixed part is preferably at least four times larger than the width of the movable part, more preferably at least ten times larger. For example, the width of the movable part may be 60 mm and the width of the fixed part 600 mm.

**[0019]** In another advantageous embodiment, the bridging system of the moving walkway can further comprise a second movable part, wherein the two movable parts, i.e. the first movable part and the second movable part, are arranged at opposite ends of the bridging system, i.e., wherein the fixed part is positioned between both of these movable parts, i.e. the first movable part and the second movable part. It is preferred that these two ends can be adapted to work in opposite directions. This provides anti-trap protection independent of the direction in which the moving walking system is going.

**[0020]** In another preferred embodiment, the handrails of the handrail system of the moving walkway are adapted to be moved with different speeds. This provides a handrail of a moving walkway which can be tailored to match the speed of the pallets of the walkway should this be required or desired.

**[0021]** In a preferred embodiment, the moving walking

system according to the invention can be a variable-speed moving walking system. In such a system, it is preferred that at least two handrails are comprised within the handrail system, wherein said at least two handrails are preferably in single line configuration. The speed of each handrail belt can be varied or constant, wherein the speed of the walking platform preferably corresponds to the speed of the adjacent handrail belt. When the handrail system comprises three handrails, the handrail belts of the first and last handrail may travel at the same speed, with the walking platform preferably having a corresponding speed to each respective adjacent handrail belt. The middle handrail belt may travel at a different speed, wherein the walking platform preferably has a corresponding speed also. All three handrail belts can also travel at the same constant speed, and thus preferably the walking platform also.

**[0022]** When the handrail system comprises five handrails in single line configuration, the first and last handrail belt may travel at the same speed, preferably this speed is a constant speed; the middle handrail belt preferably travels at a constant speed, preferably faster than the speed of the first and last handrail belts; and the second and fourth handrail belts preferably travel at the same speed. The second and fourth handrail belts can travel at variable speeds, for example, the second handrail belt can travel at an accelerating speed, whilst the fourth handrail belt can travel at a decelerating speed, wherein the walking platform preferably travels at a speed according to the speed of the adjacent handrail belt. All five handrail belts within the handrail system can also travel at the same constant speed, thereby the walking platform also.

**[0023]** The invention also relates to a method of installing a bridging system comprising a movable part; and a fixed part on a moving walking system. Particularly the invention also relates to a method to construct a moving walking system as described before. The moving walking system preferably comprises at least one walking platform comprising a plurality of pallets, a control unit for controlling the walking system, and a handrail system with at least two handrails in single line configuration. The moving walking system can further comprise a sensor. A first handrail of the at least two handrails comprises a first end and a second end. A second handrail of the at least two handrails also comprises a first end and a second end. The method comprises the steps of:

- i. mounting the movable part of the bridging system to the first handrail at its second end, wherein said second end is preferably adjacent to the first end of the second handrail;
- ii. mounting the fixed part of the bridging system to the first end of a second handrail, said end being preferably adjacent to the second end of the first handrail comprising the movable part;
- iii.- mounting the sensor within the movable part or within the fixed part;

iv.- connecting the sensor with the control unit of the moving walking system.

**[0024]** The invention is described in more detail with the help of the figures, wherein it is shown schematically:

Fig. 1 shows a schematic representation of an embodiment of a passenger moving walking system according to the invention.

Fig. 2 shows a schematic representation of an embodiment of the movable and fixed part of the bridging system mounted between two respective handrails of the walking system according to an embodiment of the invention.

Figs. 3a and 3b show a schematic representation of a top-side view of another embodiment of the movable and fixed parts of the bridging system mounted between respective handrails of the walking system according to an embodiment of the invention, with fig. 3b showing the position of the movable part after a force is applied.

Figs. 4a and 4b show a schematic representation of a bridging system on a passenger moving walking system comprising a movable part according to another embodiment of the invention.

Fig. 5 shows a perspective view of a moving walking system according to an embodiment of the invention.

**[0025]** In Fig. 1 a passenger moving walking system 10 according to the invention is schematically shown. The walking system 10 comprises handrail system 20, wherein said handrail system 20 comprises two handrails, 101, 102 and a bridging system 1. The walking system 10 moves in a direction represented by arrow 30. Handrail 101 comprises two ends, 101a and 101b, with a middle section therebetween. Handrail 102 comprises two ends, 102a and 102b, with a middle section therebetween. The bridging system 1 comprises a movable part 11 and a fixed part 12, wherein the movable part 11 and fixed part 12 are positioned between handrails 101 and 102 at ends 101b and 102a. The movable part 11 is mounted to handrail 101 at end 101b and the fixed part 12 is mounted to handrail 102 at end 102a. The movable part 11 and fixed part 12 are themselves contactable at point M. Point M can be at any point along end 101b of handrail 101. Preferably the fixed part 12 forms the main part of the bridging system 1 and the movable part 11 forms only a small part of the bridging system 1. Even if in Fig. 1 the ratio of the touchable surface provided by the movable part 11 and by the fixed part 12 is shown as a 1:1 ratio, it is preferred that the ratio of the touchable surface provided by the movable part 11 and by the fixed part 12 is less than 1:10, i.e., that the touchable surface provided by the fixed part 12 is at least 10 times longer than the touchable surface provided by the movable part 11.

**[0026]** The walking platform 103 of the moving walking system 10 comprises a plurality of pallets 1031 and runs

adjacent to handrails 101 and 102. A control unit 104 is positioned within the walking system 10. It is shown schematically as sitting underneath the walkway 103 for merely reference purposes. The moving walking system 10 according to the invention can also comprise further handrails (not shown). When more than two handrails in single line configuration are involved in a moving walkway, more than one bridging system 1 can be employed. This ensures a bridging system exists between all handrails in a single line configuration of the moving walkway.

**[0027]** Fig. 2 shows a close-up view of the movable part 11 and fixed part 12 mounted to handrails 101 and 102 respectively of the handrail system 20 in moving walking system 10 according to another embodiment of the invention. In this embodiment, the handrail system 20 comprises a friction wheel 2 at the ends of each handrail 101 and 102 for guiding or for moving and guiding the handrail belts 1011, 1021, respectively, wherein in Fig. 2 only a part of a first handrail 101 and a second handrail 102 of the handrail system is shown. The fixed part 12 of the bridging system 1 is mounted to handrail 102 at connection 122, for example by using a bolt (not shown). Preferably the fixed part 12 is mounted to the balustrade of handrail 102. The movable part 11 of the bridging system 1 is mounted to handrail 101 and is in communication with the axle of friction wheel 50. The friction wheel 2 can itself be in communication with the pallets 1031 (not shown) of walking platform 10. Handrail belt 1011 of handrail 101 passes the movable part 11 at point x and again at point y. When a force F, which is symbolized in Fig. 2 by an arrow, is applied to the movable part 11, and the force F exceeds a predetermined threshold, the movable part 11 moves, in this example rotatably moves, in moving direction 40 of the movable part 11. The movable part 11 is hereby guided by the fixed part 12 along the dotted line 121. The movable part 11 and the handrail belt 1011 do not contact each other throughout this movement. The axle 50 of the friction wheel 2 forms the axis of rotation of the movable part 11. By the movement of the movable part 11, the movable part 11 releases the region of the bridging system 1 where the handrail belt 101 enters the bridging system 1 and thus prevents user entrapment. Furthermore, the movement of the movable part 11 can be detected by a sensor (not shown in Fig. 2), wherein the sensing of the movement of the movable part 11 causes the moving walking system 10 to be decelerated and stopped. Moreover, it can be envisaged that according to a further embodiment the portion of belt 1011 comprised within the movable part 11 can be contacted by the movable part 11 so that the movable part 11 acts like a brake on the handrail 101 thus causing the handrail 101 to stop. It can also be envisaged that this can cause the handrail system 20 as a whole to stop.

**[0028]** Figs. 3a and 3b show a top-side view of handrail system 20 comprising the bridging system 1, wherein the movable part 11 and the fixed part 12 are contacted. The fixed part 12 is mounted to handrail 102 and secured at

connection 122. The movable part 11 is mounted to handrail 101 and connected to the axle of friction wheel 50. Handrail belt 1011 passes through movable part 11 at point x and at point y. The movable part 11, when at rest or subjected to a force F, preferably has no contact with handrail belt 1011 or handrail belt 1021. Figure 3b shows the effect of an applied force F to the movable part 11, wherein the applied force F exceeds a predetermined threshold, e.g. a threshold of 5 N. As a result of applying the force F to the movable part 11, the movable part 11 moves, preferably rotatably moves, downwards along the guiding surface 121 of the fixed part 12 and activates a sensor (not shown). The sensor can be any sensor capable of being activated by an applied force, for example, it may be comprised of a compression spring system, pneumatic system, or an electronic circuit. Alternatively, the sensor may be capable of detecting a movement of the movable part 11, e.g. one part of the sensor may be mounted on the inner side of the movable part 11 with a vis-à-vis counterpart, wherein in the case of a movement, the offset of both parts is detected. Once the sensor is activated, a signal is communicated to a control unit (not shown). The position of x and y shift down to x' and y'. Preferably, the movable part 11 moves rotatably along the guiding surface 121 upon application of a force F, which exceeds a predetermined threshold. Preferably, this rotative movement ensures that the movable part 11 lies essentially parallel to the belt of the first handrail belt 1011 at all times, i.e., during its resting position and when a force F is applied to it.

**[0029]** Figs 4a and 4b show a top-side view of the mechanism of the movable part 11 of walking system 10 according to an exemplary embodiment of the invention. The movable part 11 in this embodiment comprises three parts, a top part 116, a middle part 117, and a bottom part 118. The movable part 11 is preferably mounted to handrail 101 and the fixed part is preferably mounted to handrail 102 and preferably secured at connection 122. Handrail belt 1011 preferably passes the top part 116 at point x and the bottom part 118 at point y. In fig. 4b a force F is applied to the movable part 11, preferably it is applied to top part 116 i.e., the part which is contactable by a user holding onto handrail 101. The movable part 11, when at rest or subjected to a force F, preferably has no contact with handrail belt 1011 or handrail belt 1021. The application of the force F to the movable part 11 causes the top part 116 to move downwards, in the embodiment shown in fig. 4a and fig. 4b rotatively downwards, into the middle part 117. The middle part 117 can receive the top part 116, and can itself move downwards, in the embodiment shown in fig. 4a and fig. 4b, rotatively downwards and be received by the bottom part 118. The bottom part 118 is preferably fixed, and thereby is capable of stabilizing the top and middle parts 116, 117. A sensor (not shown) is comprised within either the movable part or the fixed part. Preferably, the sensor is comprised within the top part 116, or the middle part 117, or the bottom part 118 of the movable part 11. Most prefer-

ably the sensor is comprised within the top part 116 or the middle part 117 of movable part 11. It is also envisaged that the sensor can straddle at least two parts of the movable part 11, e.g., the top part 116 and middle part 117, the middle part 117 and bottom part 118. This can ensure that a signal is sent to a control unit (not shown) to stop at least a part of walking system 10 as quickly as possible after the application of force F.

**[0030]** Fig. 5 shows a perspective view of the walking system 10 according to an exemplary embodiment of the invention. The walking system 10 comprises a walking platform 103 with a plurality of pallets 1031 on each side of the walking system 10 in a single line configuration; a handrail system 20 comprising a first handrail 101 and second handrail 102 respectively, on each side of the walking system 10 in a single line configuration, wherein handrail 101 has a handrail belt 1011 and handrail 102 has a handrail belt 1021; and a bridging system 1. The gap between the non-overlapping handrails 101, 102 is bridged by the bridging system 1, which allows a user of the walking system to keep his/her hand on the handrail system 20. The bridging system 1 comprises a movable part 11 and a fixed part 12 as previously described e.g. with reference to Fig. 2. The walking system 10 further comprises a control unit 104, which is shown in Fig. 5 for illustration purposes only.

#### Reference signs list

##### [0031]

1	bridging system
2	friction wheel
3, 4, 5	connection points
10	passenger moving walking system
101	first handrail
102	second handrail
101a	first end of first handrail
101b	second end of first handrail
102a	first end of second handrail
102b	second end of second handrail
103	walking platform
104	control unit
1011	handrail belt of first handrail
1021	handrail belt of second handrail
1031	pallets
11	movable part
116	top part
117	middle part
118	bottom part
12	fixed part
121	guiding surface
122	connection to handrail
13	sensor

20 handrail system  
 30 moving direction of the handrail system (20)  
 40 moving direction of moving part (11)  
 50 axle of friction wheel  
 F force applied on the movable part (11)

## Claims

1. A moving walking system (10) comprising  
 at least one walking platform (103) comprising a plu-  
 rality of pallets (1031),  
 a handrail system (20) with at least two handrails in  
 single line configuration,  
 wherein a first handrail (101) of the at least two hand-  
 rails comprises a first end (101a) and a second end  
 (101b), and a second handrail (102) of the at least  
 two handrails comprises a first end (102a) and a sec-  
 ond end (102b),  
 and  
 a bridging system (1) forming a bridge between the  
 second end (101b) of the first handrail (101) and the  
 first end (102a) of the second handrail (102),  
**characterized in that**  
 the bridging system (1) comprises a movable part  
 (11) and a fixed part (12),  
 wherein the movable part (11) and the fixed part (12)  
 are themselves contactable to form the bridge be-  
 tween the first handrail (101) and the second handrail  
 (102), and  
 wherein the movable part (11) is arranged in front of  
 the fixed part (12) with respect to a moving direction  
 (30) of the handrail system (20), and  
 wherein the movable part (11) is adapted to work as  
 an anti-trap protection for users of the handrail sys-  
 tem (20).
2. The moving walking system (10) according to claim  
 1, **characterized in that** the moveable part (11) is  
 positioned at the second end (101b) of the first hand-  
 rail (101) and the fixed part (12) is positioned at the  
 first end (102a) of the second handrail (102).
3. The moving walking system (10) according to claim  
 1 or claim 2, **characterized in that** the movable part  
 (11) of said bridging system (1) is adapted to move  
 along a guiding surface (121) of the fixed part (12)  
 when a force (F), which exceeds a predetermined  
 threshold, is applied on the movable part (11) in the  
 direction of the moving direction (40) of the moving  
 part (11), wherein the guiding surface (121) is es-  
 sentially parallel to the belt of the first handrail (101)  
 covered by the bridging system (1).
4. The moving walking system (10) according to any of  
 the preceding claims, **characterized in that** the  
 movable part (11) of said bridging system (1) is  
 adapted to move as a single part when a force (F),  
 which exceeds a predetermined threshold, is applied  
 on the movable part (11) in the direction of the mov-  
 ing direction (40) of the moving part (11).
5. The moving walking system (10) according to claims  
 1 to 3, **characterized in that** the movable part (11)  
 of said bridging system (1) comprises several parts  
 wherein the movable part (11) is adapted to move  
 as several parts when a force (F), which exceeds a  
 predetermined threshold, is applied on the movable  
 part (11) in the direction of the moving direction (40)  
 of the moving part (11).
6. The moving walking system (10) according to any of  
 the preceding claims **characterized in that** the mov-  
 able part (11) of said bridging system (1) is mounted  
 to a further system, said further system being adapt-  
 ed to support the handrail.
7. The moving walking system (10) according to any of  
 the preceding claims **characterized in that** the mov-  
 ing walking system (10) further comprises a sensor  
 (13), wherein the sensor (13) is adapted to sense a  
 movement of the moveable part (11).
8. The moving walking system (10) according to claim  
 7 **characterized in that** the movable part (11) acts  
 on the sensor when moving.
9. The moving walking system (10) according to claim  
 7 or claim 8 **characterized in that** the moving walk-  
 ing system (10) comprises at least one control unit  
 (104) for controlling the moving walking system (10),  
 wherein the sensor (13) is in communication with the  
 control unit (104), and wherein the control unit (104)  
 is adapted to stop the moving walking system (10)  
 if the sensor (13) detects a movement of the movable  
 part (11).
10. The moving walking system (10) according to any of  
 the preceding claims **characterized in that** the mov-  
 able part (11) works against spring tension when it  
 is moved by applying a force (F), which exceeds a  
 predetermined threshold, on the movable part (11)  
 in the direction of the moving direction (40) of the  
 moving part (11).
11. The moving walking system (10) according to any of  
 the preceding claims **characterized in that** the mov-  
 able part (10) is adapted to be moved back to its  
 initial position when no force (F) is applied on the  
 movable part (10) in the moving direction (40) of the  
 movable part (11), preferably by spring tension.
12. The moving walking system (10) according to any of  
 the preceding claims **characterized in that** the mov-  
 able part (11) and the fixed part (12) of the bridging  
 system (1) represent a touchable surface wherein

the ratio of the touchable surface provided by the movable part (11) and by the fixed part (12) is less than 1:4 respectively, preferably less than 1:10.

13. The moving walking system (10) according to any of the preceding claims **characterized in that** the bridging system (1) comprises a second movable part, wherein the movable parts (11) are arranged at opposite ends of the bridging system (1) and are adapted to work in opposite direction in order to provide the anti-trap protection independent of the moving direction of the moving walking system and wherein the fixed part (12) is positioned between both movable parts.
14. The moving walking system (10) according to any of the preceding claims **characterized in that** the handrails (101, 102) of the handrail system (20) are adapted to be moved with the same or different speeds.
15. A method of installing a bridging system (1) on a moving walking system (10), wherein the bridging system (1) comprises at least one movable part (11) and at least one fixed part (12), and wherein the moving walking system (10) comprises at least one walking platform (103) with a plurality of pallets (1031), a control unit (104) for controlling the walking system (10), a sensor (13), a handrail system with at least two handrails in single line configuration, wherein a first handrail (101) of the at least two handrails comprises a first end (101a) and a second end (101b), and a second handrail (102) of the at least two handrails comprises a first end (102a) and a second end (102b) **characterized by** the following steps:
- mounting the movable part (11) of the safety bridging system (1) to the second end (101b) of the first handrail (101);
- mounting the fixed part (12) of the safety bridging system (1) to the first end (102a) of the second handrail (102);
- mounting a sensor (13) for detecting a movement of the movable part (11);
- connecting the sensor (13) with the control unit (104) of the moving walking system (10).



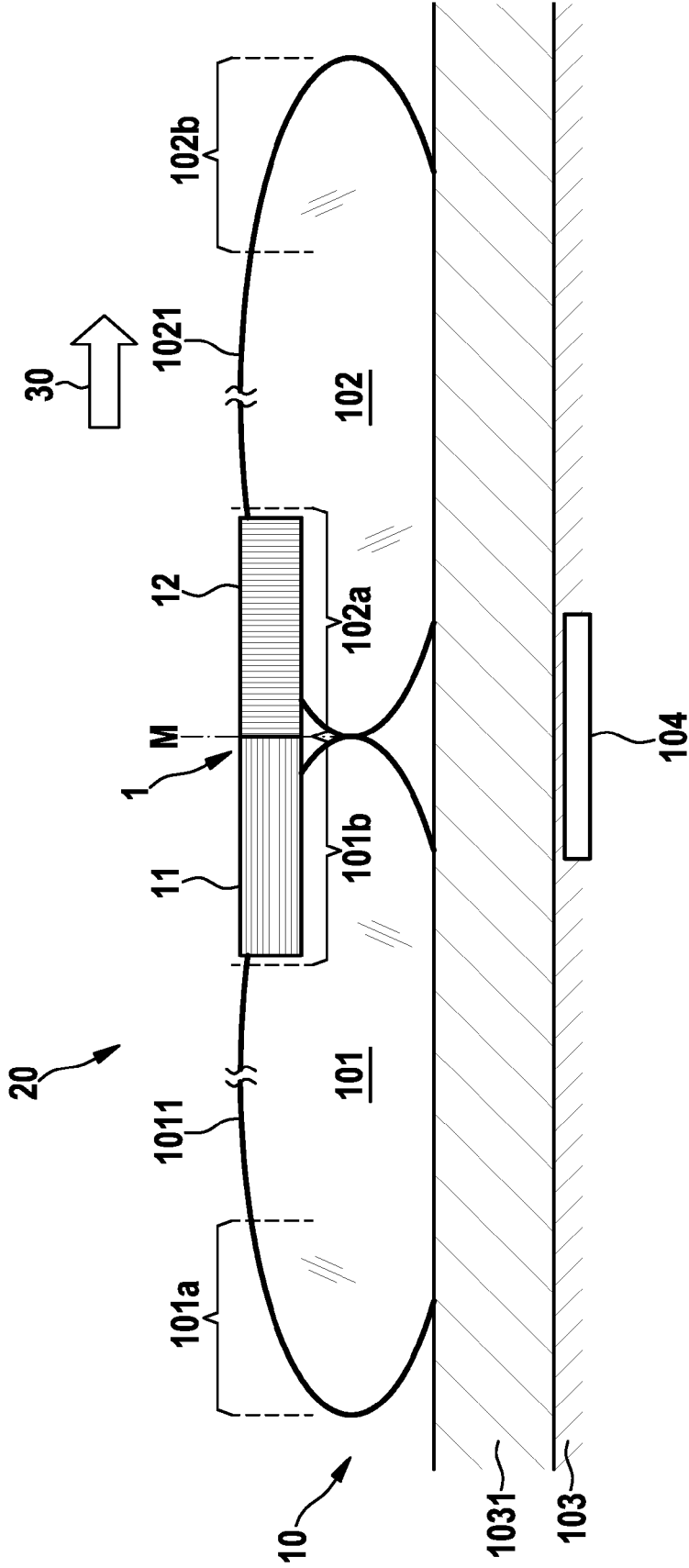


Fig. 1

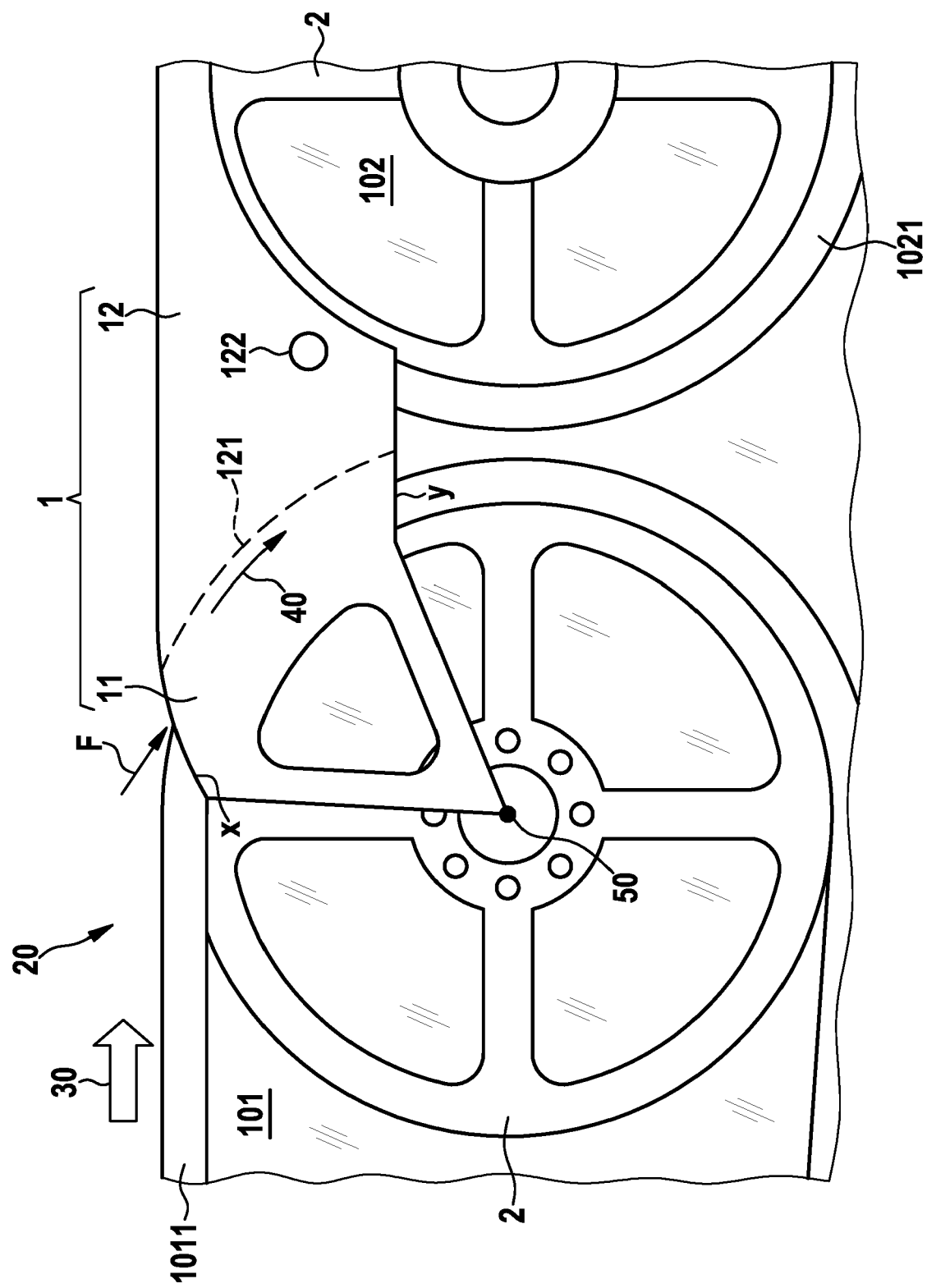
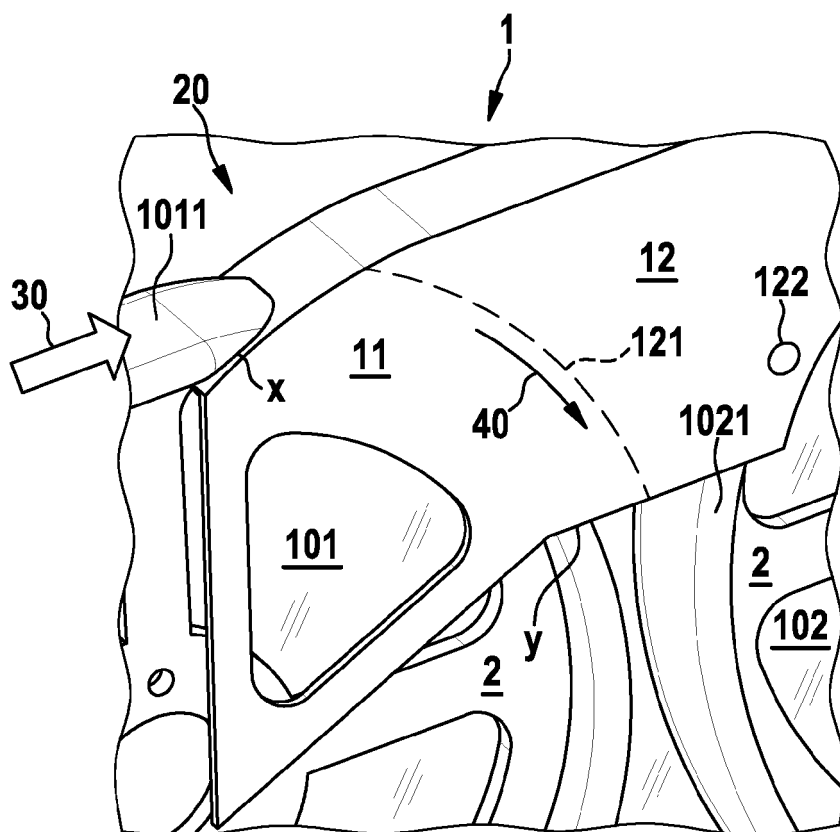
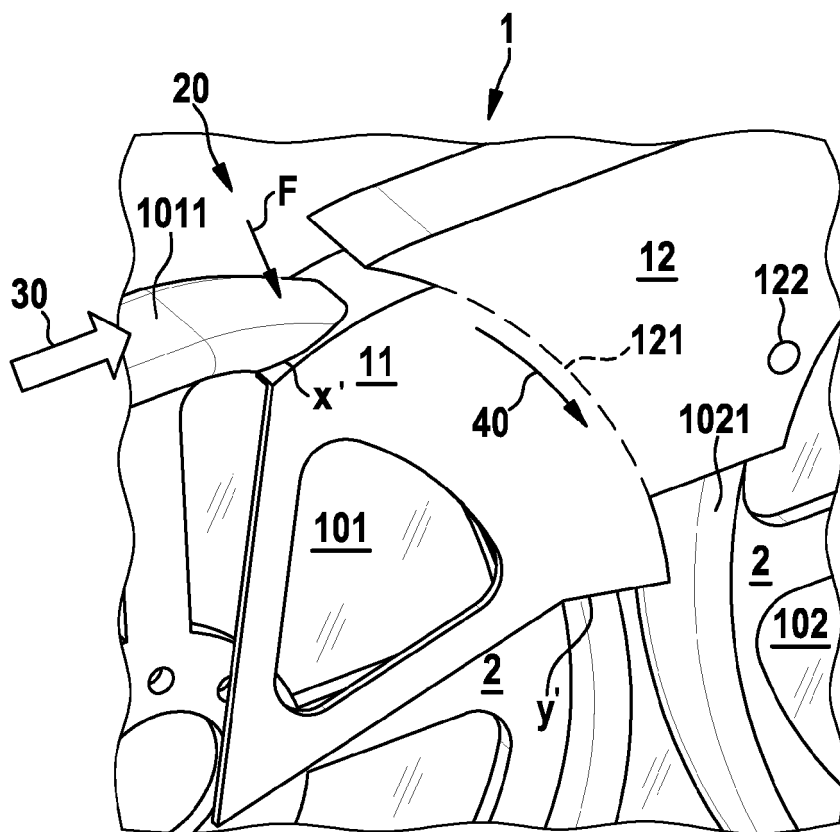


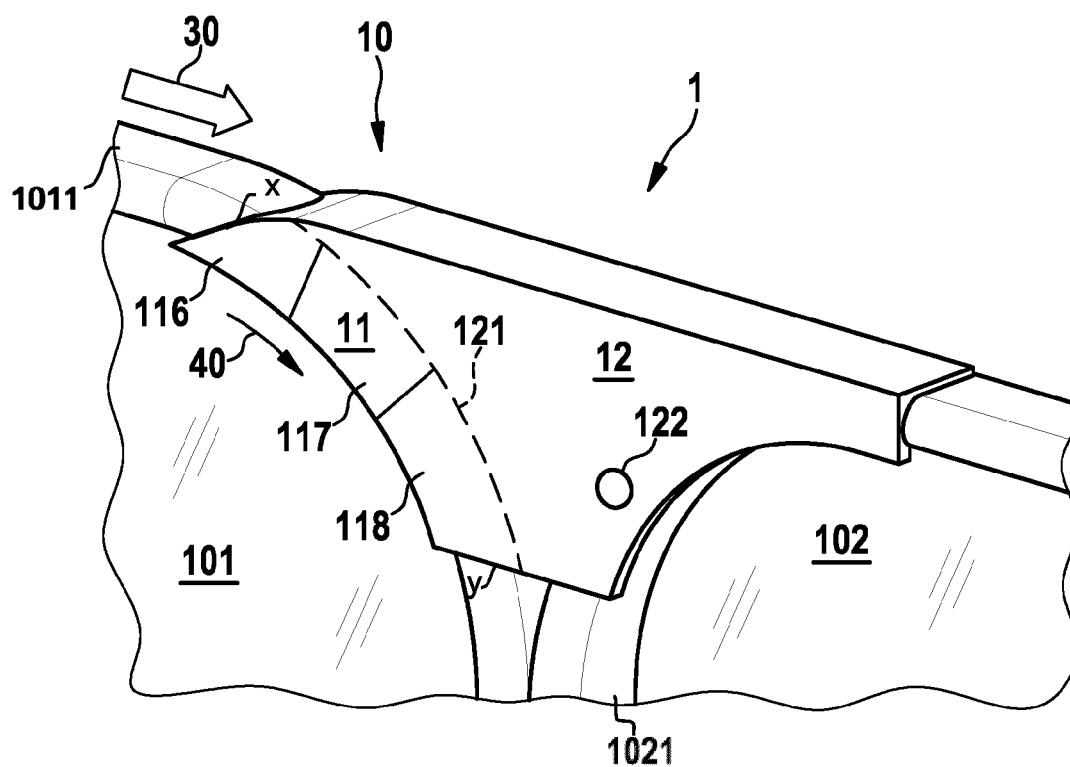
Fig. 2



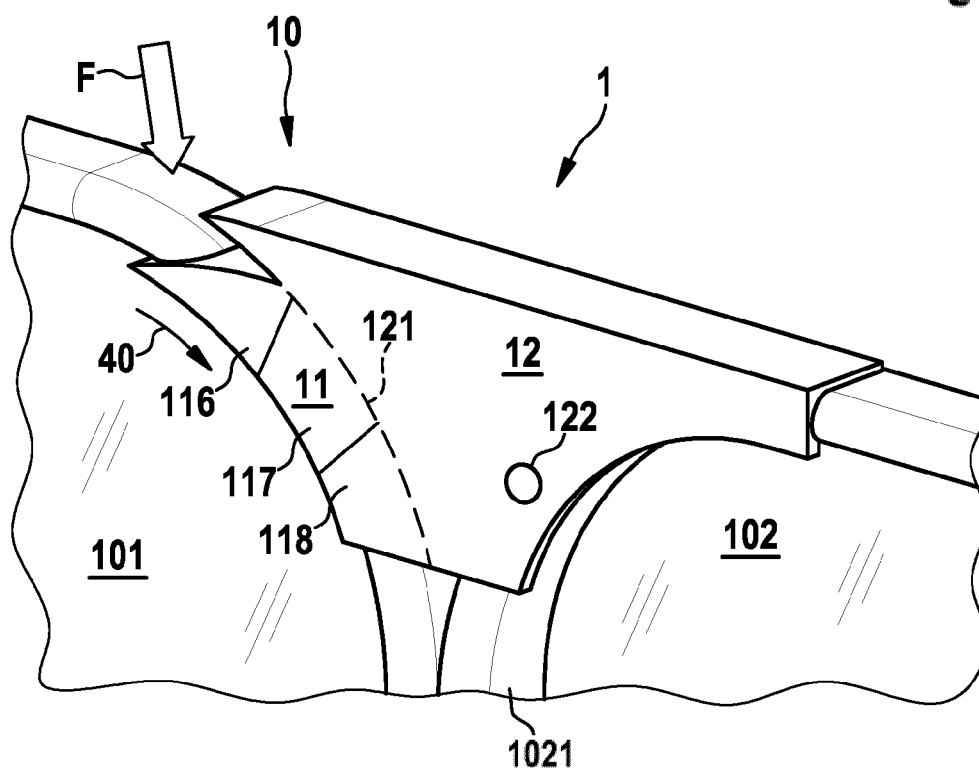
**Fig. 3a**



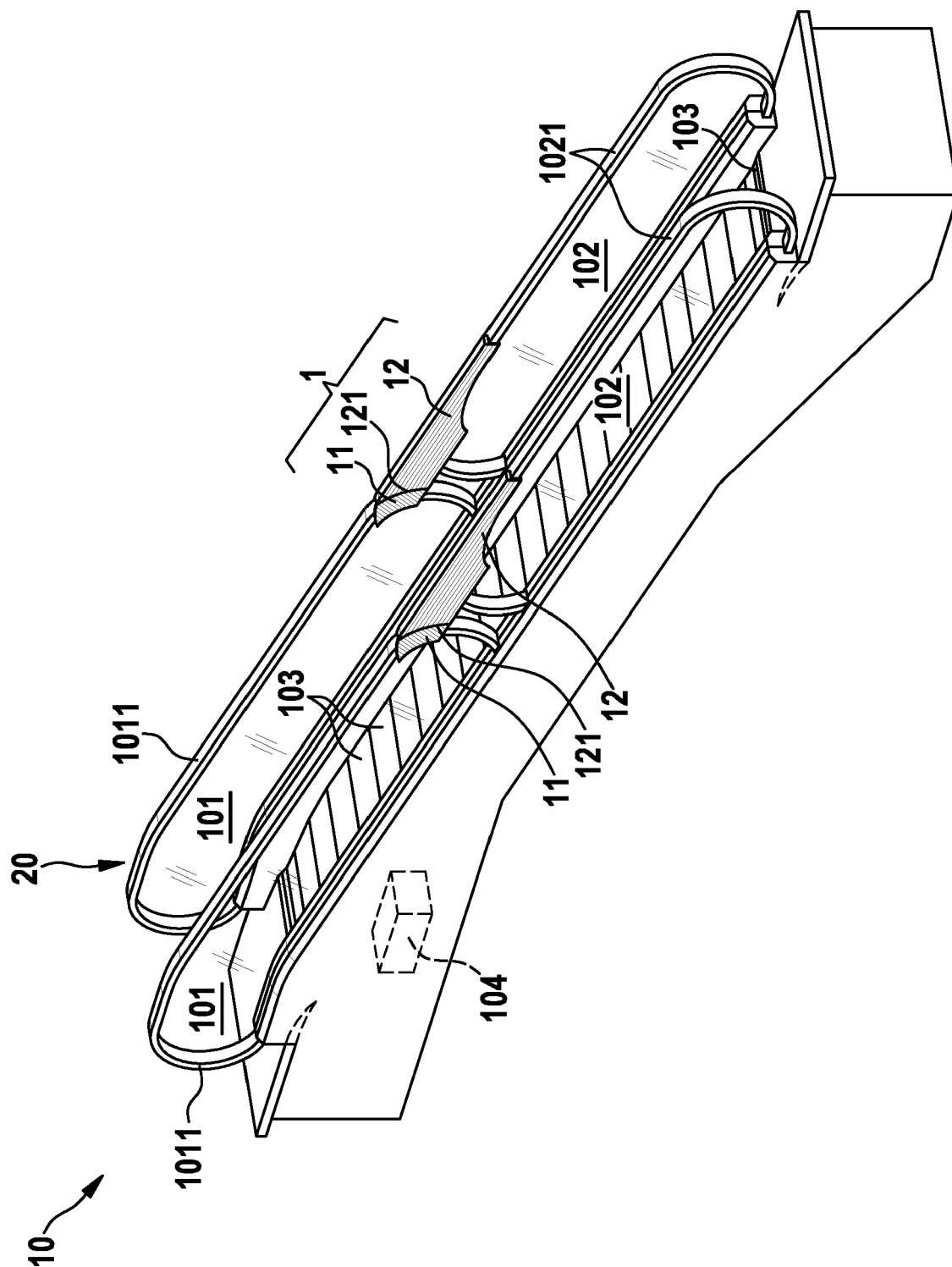
**Fig. 3b**



**Fig. 4a**



**Fig. 4b**



**Fig. 5**



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Application Number  
EP 18 38 2229

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The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 5 November 2018	Examiner Dogantan, Umut H.
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05-11-2018

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