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(54) **A BARRIER AND METHOD FOR SELECTIVELY RESTRICTING VEHICULAR ACCESS**

(57) A barrier and method for selectively restricting vehicular access are disclosed. The barrier (10) comprises: a side barrier portion (12) located, in use, at each end of the barrier (10), for restricting passage of a vehicle across the barrier (10) to a region between the side barrier portions (12); and a central barrier portion (14), wherein, in use, the central barrier portion (14), is located between the side barrier portions (12) and is separated from each side barrier portion (12) by a respective wheel

track region (16); wherein a height (h2) of the central barrier portion (14) is selected to allow a first class of vehicle having a first ground clearance greater than the height (h2) of the central barrier portion (14) to be driven across the barrier (10) with its wheels passing over the wheel track regions (16), while blocking a second class of vehicle having a second ground clearance smaller than the height (h2) of the central barrier portion (14) from being driven across the barrier (10).

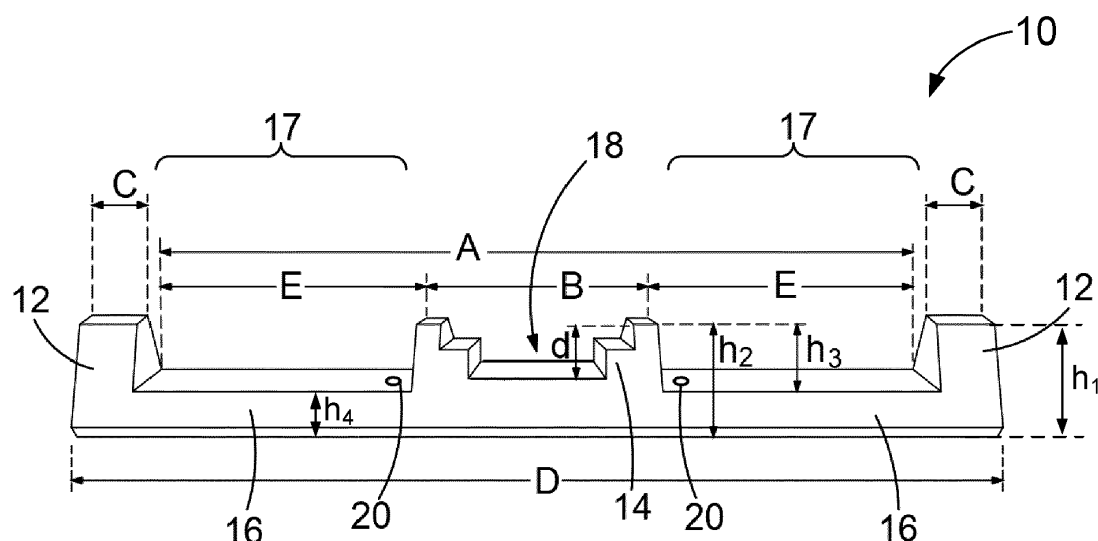


FIGURE 1

Description

FIELD OF THE INVENTION

[0001] The present invention relates to a barrier and method for selectively restricting vehicular access.

BACKGROUND OF THE INVENTION

[0002] Trespassing on agricultural land can cause damage to crops and endanger livestock. In particular, damage may be caused by vehicles being driven over agricultural land without permission. In some areas, this has become a problem due to poachers driving over agricultural land to gain access to game.

[0003] However, blocking access to fields prevents farmers from accessing their land

SUMMARY OF THE INVENTION

[0004] According to a first aspect of the present invention, there is provided a barrier for selectively restricting vehicular access, the barrier comprising:

a side barrier portion located, in use, at each end of the barrier, for restricting passage of a vehicle across the barrier to a region between the side barrier portions; and

a central barrier portion, wherein, in use, the central barrier portion is located between the side barrier portions and is separated from each side barrier portion by a respective wheel track region;

wherein a height of the central barrier portion is selected to allow a first class of vehicle having a first ground clearance greater than the height of the central barrier portion to be driven across the barrier with its wheels passing over the wheel track regions, while blocking a second class of vehicle having a second ground clearance smaller than the height of the central barrier portion from being driven across the barrier.

[0005] Advantageously, the present invention enables a first class of vehicle (for example large agricultural vehicles such as tractors or crop sprayers) to access an area, while blocking access for smaller vehicles (for example, pick-up trucks, cars, or sports utility vehicles). This may be useful in preventing damage to crops by unauthorised vehicles, while allowing access to agricultural machinery such as crop sprayers for treating crops during the growing period. A further advantage is that the barrier may enable gates to be left open or dispensed with altogether, leading to a saving of time which would have been spent opening and closing the gates each time the area was accessed, and reducing losses due to theft of gates.

[0006] The height of the central barrier portion may be less than or equal to 1 metre.

[0007] The height of the central barrier portion may be less than or equal to 70cm.

[0008] The height of the central barrier portion may be less than or equal to 55cm.

[0009] Advantageously, the height of the central barrier portion relative to the wheel track regions is sufficiently small that large agricultural vehicles such as tractors, which typically have a ground clearance of 45 cm to 55 cm or more, or self-propelled crop sprayers, which typically have a ground clearance of around 70 cm to 90 cm or more, can easily clear the central barrier portion when driven across the barrier with their wheels in the wheel track regions.

[0010] The height of the central barrier portion relative to the wheel track regions may be at least 45 cm.

[0011] The height of the central barrier portion relative to the wheel track regions may be at least 30 cm.

[0012] Advantageously, the height of the central barrier portion is sufficiently large that smaller vehicles such as cars, pick-up trucks and sports utility vehicles, which typically have a ground clearance of around 20cm (for example, cars and pick-up trucks typically have a ground clearance of around 18 to 22 cm, while some off-road vehicles have ground clearances of up to 30cm), cannot clear the central barrier portion and are therefore blocked from driving across the barrier.

[0013] In use, each of the wheel track regions may have a width of less than or equal to 1.7m.

[0014] Advantageously, this width is sufficiently small to prevent most vehicles from passing between the central barrier portion and one of the side barrier portions. However, it may be sufficiently wide to allow small vehicles such as quad bikes, shepherds buggies or gators, which typically have widths of less than 1.65 metres, to pass through the gap between the central barrier portion and each side barrier portion.

[0015] In some embodiments, each of the wheel track regions may have a width of less than or equal to 1.6m or less than or equal to 1.4m. This will prevent even smaller vehicles passing through the gap between the central barrier portion and each side barrier portion.

[0016] The central barrier portion may comprise a central channel in its upper surface.

[0017] Advantageously, a central channel in the upper surface of the central barrier portion may provide clearance for low-hanging tow hitches on vehicles which otherwise have a relatively high ground clearance. For example, a tractor may have a maximum ground clearance in the range 45 to 55cm, but the tow hitch may clear the ground by only around 22cm. Therefore, a central barrier portion having, for example, a height of 30cm and a central channel having a depth of around 10cm, may allow access across the barrier for a tractor having a low-hanging tow hitch, while blocking access for vehicles having a ground clearance smaller than 30cm. Also, the central channel may help to obstruct any attempts to set a ramp over the central barrier region for unauthorised access.

[0018] The central channel may have an upper surface

at the same height or higher than an upper surface of the wheel track regions. In embodiments in which the barrier further comprises wheel track portions, spanning said respective wheel track regions, the central channel may have an upper surface at the same height or higher than an upper surface of the wheel track portions. The central channel may have a height relative to the wheel track regions of equal to or less than 15cm.

[0019] The central channel may have stepped sides.

[0020] The barrier may comprise concrete.

[0021] Usefully, a barrier comprising concrete may be too heavy to be easily moved by an unauthorised person, may be durable, and may be relatively simple to manufacture, for example by casting.

[0022] The barrier may comprise a reinforcing member.

[0023] The barrier may further comprise wheel track portions, spanning said respective wheel track regions, and connecting the central barrier portion to the respective side barrier portions.

[0024] By providing wheel track portions connecting the central barrier portion to the respective side barrier portions, it is more difficult to move the barrier since the barrier as a whole has a greater size and weight than the individual portions. In addition, the wheel track portions help to prevent rutting of the surface in the wheel track regions.

[0025] The central barrier portion and wheel track portions may be integrally formed.

[0026] The central barrier portion, wheel track portions and side barrier portions may be integrally formed.

[0027] By integrally forming the central barrier portion, wheel track portions and optionally the side barrier portions, it becomes more difficult to move the barrier as it can only be moved in its entirety.

[0028] The barrier may include at least one attachment member.

[0029] By providing at least one attachment member, for example one or more hooks or eyelets, on the barrier, the barrier may be moved by dragging or lifting when access is required for vehicles blocked by the barrier. For example, the barrier may be moved at harvest time to provide access for combine harvesters, cultivators, trailers, and so on. Eyelets on the upper surface of the barrier, for example in the wheel track regions, may be used to attach lifting chains. An attachment member at one end of the barrier may be used for dragging the barrier out of a gateway or entrance. The attachment members may be recessed so that they do not protrude above the upper surface of the barrier.

[0030] A separation between the side barrier portions may be at least 2.5m.

[0031] A separation between the side barrier portions may be at least 3.3m.

[0032] The side barrier portions may include vertical channels for receiving respective gate posts.

[0033] The barrier may further comprise at least one gate post integrated with a respective one of said side

barrier portions.

[0034] By incorporating gate posts into the side barrier portions, it becomes more straightforward to install a barrier spanning a gateway. The gate may close against one side of the barrier.

[0035] According to a further aspect of the invention, there is provided an assembly comprising the barrier and a gate configured to be hung from said at least one gate post.

[0036] According to a further aspect of the invention, there is provided an assembly, comprising a barrier as defined above, and at least one gate post.

[0037] Said at least one gate post may be configured to be attached to or installed in a respective one of said side barrier portions.

[0038] The assembly may further comprise a gate.

[0039] According to a further aspect of the invention, there is provided method for selectively restricting vehicular access through an entrance, the entrance comprising a side barrier portion at each side, the side barrier portions being arranged to allow a vehicle to pass through the entrance only in the region between the side barrier portions, the method comprising:

providing a central barrier portion located between the side barrier portions; and

providing wheel track regions located between the central barrier portion and each side barrier portion;

wherein a height of the central barrier portion relative to the ground is selected to allow a first class of vehicle having a first ground clearance greater than the height of the central barrier portion to be driven across the barrier with its wheels passing over the wheel track regions, while blocking a second class of vehicle having a second ground clearance smaller than the height of the central barrier portion from being driven across the barrier.

BRIEF DESCRIPTION OF THE DRAWINGS

[0040] A preferred embodiment of the present invention will now be described, by way of example only and not in any limitative sense, with reference to the accompanying drawing, in which:

Figure 1 schematically illustrates a barrier in accordance with an embodiment of the invention;

Figure 2 illustrates a barrier in accordance with an embodiment of the invention, in use, enabling access by a first vehicle;

Figure 3 illustrates a barrier in accordance with an embodiment of the invention, in use, blocking access by a second vehicle; and

Figure 4 schematically illustrates a barrier in accordance with a further embodiment of the invention.

DETAILED DESCRIPTION OF EMBODIMENTS

[0041] Figure 1 schematically shows a barrier 10 for selectively restricting vehicular access, according to an embodiment of the present invention. The barrier 10 comprises a side barrier portion 12 at each end of the barrier 10, a central barrier portion 14 located between the side barrier portions 12, and wheel track portions 16, which span respective wheel track regions 17 located between the central barrier portion 14 and each side barrier portion 12. The wheel track portions 16 connect the central barrier portion 14 to the respective side barrier portions 12.

[0042] The barrier 10 is configured to allow a first class of vehicle 100 to be driven across the barrier with its wheels located in the wheel track regions, as shown in Figure 2, while blocking a second class of vehicle 200 from being driven across the barrier, as shown in Figure 3. The embodiment of the barrier 10 illustrated in Figure 1 is configured such that the first class of vehicle 100 includes some large agricultural machinery such as tractors and crop sprayers, and the second class of vehicle 200 includes most pick-up trucks, cars and sports utility vehicles.

[0043] The side barrier portions 12 are arranged to restrict passage of a vehicle across the barrier 10 to the region between the side barrier portions 12. In the embodiment shown in Figures 1 to 3, the side barrier portions 12 have a separation A of about 3.4 metres, sufficient for most vehicles to pass between them. For example, some crop sprayers may be around 3m wide. However, in other embodiments, the separation A of the side barrier portions 12 may be greater or smaller depending on the width of the entrance in which the barrier 10 is to be installed, and the widths of vehicles requiring access. For example, the separation A of the side barrier portions 12 may be at least 2.5m, or up to 3.3 m or more. In the embodiment shown in Figures 1 to 3, the height h1 of the side barrier portions 12 is about 50cm, that is, sufficiently high to prevent at least a first class of vehicles from driving over or straddling the side barrier portions 12.

[0044] The height h2 of the central barrier portion 14 is selected to allow the first class of vehicle 100, which typically has a first ground clearance greater than the height h2 of the central barrier portion 14 to be driven across the barrier 10 with its wheels passing over the wheel track portions 16, while blocking the second class of vehicle 200, which typically has a second ground clearance smaller than the height h2 of the central barrier portion 14, from being driven across the barrier 10.

[0045] In the embodiment illustrated in Figures 1 to 3, the height h2 of the central barrier portion 14 is about 50cm. This is sufficiently high to prevent most cars, pick-up trucks, and sports utility vehicles from driving over the barrier 10, while being sufficiently low to allow large agricultural vehicles such as tractors and crop sprayers to

clear the central barrier portion 14 when driven over the barrier 10 with their wheels on the wheel track portions 16.

[0046] However, the height h2 of the central barrier portion 14 may be greater or smaller than this depending on the specifications of the first and second classes of vehicles to be respectively allowed or denied access.

[0047] For example, the height h2 of the central barrier portion 14 may be at least 25 cm, in order to block access for vehicles such as cars, pick-up trucks and sports utility vehicles, which typically have a ground clearance in the range 18 to 22 cm. The height h2 of the central barrier portion 14 may be at least 30 cm, in order to block access to further vehicles, including some off-road vehicles, having a ground clearance of around 25cm or less, or may be at least 45 cm in order to block access to further vehicles having a ground clearance of around 30cm or less.

[0048] At the same time, the height h2 of the central barrier portion 14 may be less than 1m or less than 70cm, so that at least some self-propelled crop sprayers, which typically have a ground clearance of around 70 cm to around 100 cm or more can be driven over the barrier, or may be less than 55cm so that tractors, which typically have a ground clearance of 45 cm to 55 cm or more may also be driven over the barrier 10.

[0049] Preferably, the height h2 of the central barrier portion 14 is in the range from about 40cm to about 60cm, or more preferably in the range from about 45cm to about 55cm.

[0050] A central channel 18 is provided in the upper surface of the central barrier portion 14, the central channel 18 being oriented parallel to the direction of traffic across the barrier (i.e. substantially orthogonal to a transverse axis extending between the two side barrier portions 12). The central channel 18 provides clearance for low-hanging tow hitches or other protrusions on vehicles which otherwise have a relatively high ground clearance. For example, a tractor may have a maximum ground clearance in the range 45 to 55cm, but the tow hitch may clear the ground by only around 22cm. Therefore, a central barrier portion 14 having, for example, a height of 50cm and a central channel 18 having a depth d of around 30cm, may allow access across the barrier 10 for a tractor having a low-hanging tow hitch, while blocking access for vehicles having a ground clearance smaller than 50cm. In addition, the presence of the central channel 18 means that the upper surface of the central barrier 14 is uneven, which may help to obstruct any attempts to set a ramp over the central barrier portion 14 to overcome the barrier 10.

[0051] In other embodiments, the depth d of the central channel 18 may be determined based on the specifications of the first and second classes of vehicles. The depth d of the central channel 18 may be less than or substantially equal to the height h3 of the central barrier portion 14 relative to the upper surfaces of the wheel track portions 16, or may extend up to the full height h2 of the central barrier portion 14.

[0052] In the embodiment shown in Figures 1 to 3, the central channel 18 has stepped sides, which may further obstruct attempts to bypass the barrier 10 using ramps or the like. However, other shapes are possible, including vertical or sloping sides.

[0053] The width B of the central barrier portion 14 and the width C of each side barrier portion 12 may be selected based on the width of the entrance in which the barrier is to be placed, and the width of vehicles to be denied access across the barrier 10. The barrier 10 shown in Figures 1 to 3 has an overall width D of about 4m, to fill a gateway having a width of about 4m. In this embodiment, the central barrier portion 14 has a width B of about 1 metre and the side barrier portions 12 have a width C of about 30cm. This results in a width E of about 1.2 metres for the wheel track regions 16, such that the wheel track regions 16 are too narrow to permit vehicles such as pick-up trucks, which typically have a width of 1.4 metres or more, to pass through the gap between the central barrier portion 14 and the side barrier portions 16. However, the widths A, B, C, D and E may be varied depending on the size of the entrance to be blocked by the barrier 10, and the widths of the vehicles to be allowed/denied access. For example, the width C of each of the side barrier portions may be increased to 0.8m to provide a barrier having a total width D of 5m for blocking a 5 metre wide entrance.

[0054] In some embodiments, the wheel track regions 17 may have a width E sufficiently wide to allow a third class of vehicles, for example small vehicles such as quad bikes, shepherds buggies or gators, to pass through the gap between the central barrier portion 14 and one of the side barrier portions 12. For example, the wheel track regions or portions 16 may have a width E of less than or equal to 1.7 metres.

[0055] The barrier 10 may comprise or be formed of concrete, optionally reinforced, for example with a reinforcing member such as a metal bar embedded within it. The reinforcing member may span the lower regions of the barrier 10, including the central barrier portion 14, the wheel track portions 16 and the side barrier portions 12. When comprising concrete, the barrier 10 may be manufactured by casting. The side barrier portions 12, central barrier portion 14, and/or wheel track portions 16 may have sloping forward, rearward, and/or side faces, as shown in Figures 1 to 3. This may improve ease of manufacture, and may reduce the likelihood of damage to vehicles crossing the barrier 10. However, the forward/rearward faces are sufficiently steep that vehicles cannot drive over the central or side barrier portions.

[0056] In the present embodiment, the height h4 of the wheel track portions is around 15cm, and the forward and rearward sides are ramped for ease of passage across the wheel track portions 16. However, the height h4 may be increased or decreased as necessary, depending on specific requirements or manufacturing constraints.

[0057] Attachment members in the form of eyelets 20

are recessed into the upper surfaces of the wheel track portions 16, providing a means for lifting and moving the barrier 10 when it is no longer needed. For example, the barrier 10 may be used to restrict access to a field when the crops are growing, allowing access only for tractors or crop sprayers, then moved away at harvest time to allow access for combine harvesters and trailers. Alternatively, an attachment member in the form of an eyelet or hook may be provided at one end of the barrier 10, for example at one side of one of the side barrier portions 12, to enable the barrier 10 to be dragged away from an entrance.

[0058] The barrier 10 shown in Figures 1 to 3 is an integral unit comprising the central barrier portion 14, wheel track portions 16 and side barrier portions 12. This increases the overall weight and bulk of the barrier 10, making it more difficult to be moved by unauthorised persons. However, in other embodiments, the side barrier portions 12 may be provided as separate units from the central barrier portion 14. For example, the side barrier portions 12 may be provided by existing infrastructure such as gate posts. Additionally, the wheel track portions 16 may be omitted in some embodiments. However, these are useful for preventing the ground in the wheel track regions from becoming rutted, thereby changing the clearance required for a vehicle to clear the central barrier portion 14.

[0059] In some embodiments, gate posts may be attached to or installed in the side barrier portions 12. For example, the side barrier portions 12 may include vertical channels (not shown) for receiving respective gate posts.

[0060] Figure 4 illustrates an assembly comprising a barrier 10' and a gate 300 according to another embodiment of the invention. The barrier 10' differs from the barrier 10 described above only in that the side barrier portions 12' are extended upwards to form integrated gate posts 12'. The gate posts 12' may thus be formed of cast concrete. A height of the gate posts 12' of up to 1.5 metres is sufficient for most commonly-used agricultural gates. The gate posts 12' may be provided with hardware for hanging a gate 300.

[0061] It will be appreciated by persons skilled in the art that the above embodiments have been described by way of example only, and not in any limitative sense, and that various alterations and modifications are possible without departure from the scope of the invention as defined by the appended claims.

Claims

1. A barrier for selectively restricting vehicular access, the barrier comprising:

a side barrier portion located, in use, at each end of the barrier, for restricting passage of a vehicle across the barrier to a region between the side barrier portions; and

- a central barrier portion, wherein, in use, the central barrier portion is located between the side barrier portions and is separated from each side barrier portions by a respective wheel track region;
 wherein a height of the central barrier portion is selected to allow a first class of vehicle having a first ground clearance greater than the height of the central barrier portion to be driven across the barrier with its wheels passing over the wheel track regions, while blocking a second class of vehicle having a second ground clearance smaller than the height of the central barrier portion from being driven across the barrier.
2. A barrier according to claim 1, wherein a height of the central barrier portion is less than or equal to 1 metre and/or wherein, in use, each of the wheel track regions has a width of less than or equal to 1.7m and/or wherein the central barrier portion comprises a central channel in its upper surface.
 3. A barrier according to claim 2, wherein the central channel may have an upper surface at the same height or higher than an upper surface of the wheel track regions.
 4. A barrier according to claim 2 or claim 3, wherein the central channel has stepped sides.
 5. A barrier according to any one of the preceding claims, wherein the barrier comprises concrete.
 6. A barrier according to claim 5, wherein the barrier comprises a reinforcing member.
 7. A barrier according to any one of the preceding claims, further comprising wheel track portions, spanning said respective wheel track regions and connecting the central barrier portion to the respective side barrier portions.
 8. A barrier according to any one of the preceding claims, wherein the central barrier portion and wheel track portions are integrally formed and/or wherein the central barrier portion, wheel track portions and side barrier portions are integrally formed.
 9. A barrier according to any one of the preceding claims, further comprising at least one attachment member.
 10. A barrier according to any one of the preceding claims, wherein the side barrier portions comprise vertical channels for receiving respective gate posts.
 11. A barrier according to any one of the preceding claims, further comprising at least one gate post integrated with a respective one of said side barrier portions.
 12. An assembly comprising a barrier according to claim 11 and a gate arranged to be hung from said at least one gate post.
 13. An assembly, comprising a barrier according to any one of claims 1 to 12, and at least one gate post configured to be attached to or installed in a respective one of said side barrier portions.
 14. An assembly according to claim 13, further comprising a gate.
 15. A method for selectively restricting vehicular access through an entrance, the entrance comprising a side barrier portion at each side, the side barrier portions being arranged to allow a vehicle to pass through the entrance only in the region between the side barrier portions, the method comprising:
 - providing a central barrier portion located between the side barrier portions; and
 - providing wheel track regions located between the central barrier portion and each side barrier portion;
 - wherein a height of the central barrier portion relative to the ground is selected to allow a first class of vehicle having a first ground clearance greater than the height of the central barrier portion to be driven across the barrier with its wheels passing over the wheel track regions, while blocking a second class of vehicle having a second ground clearance smaller than the height of the central barrier portion from being driven across the barrier.

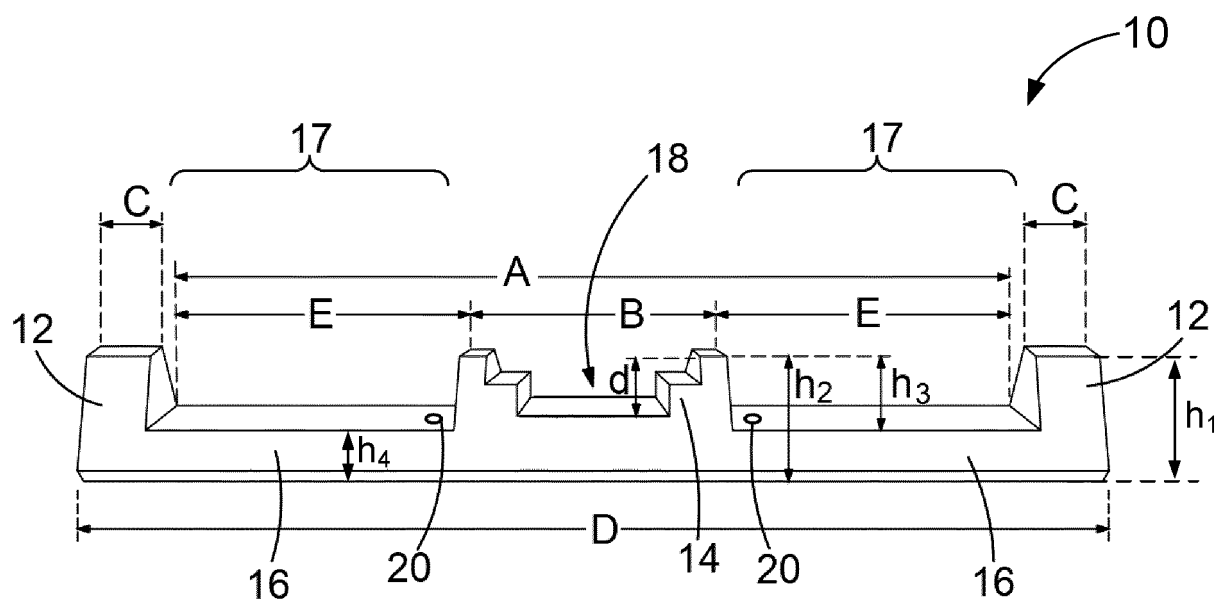


FIGURE 1

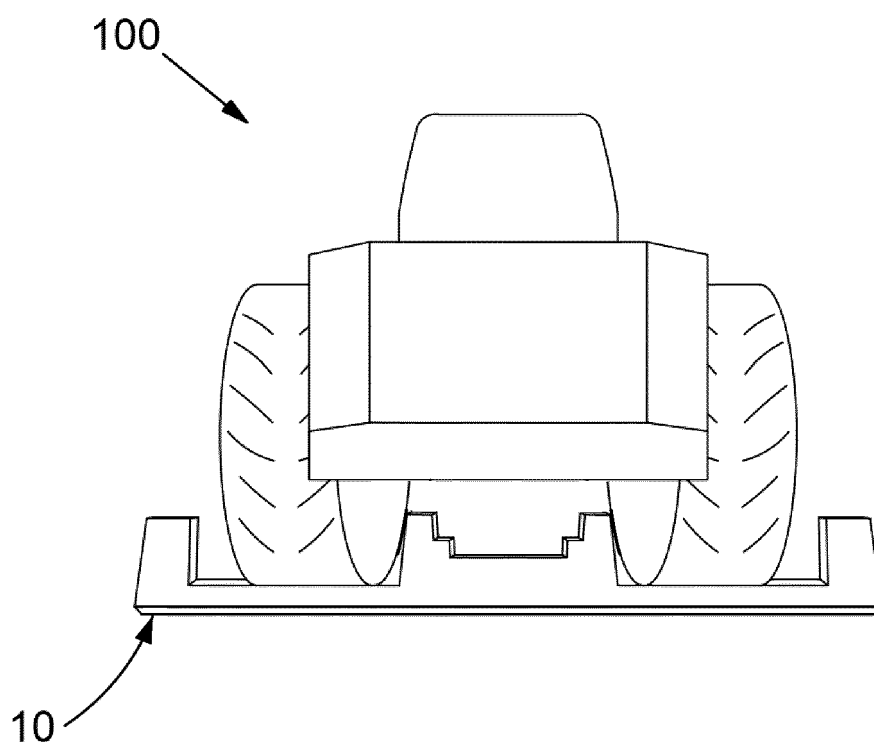


FIGURE 2

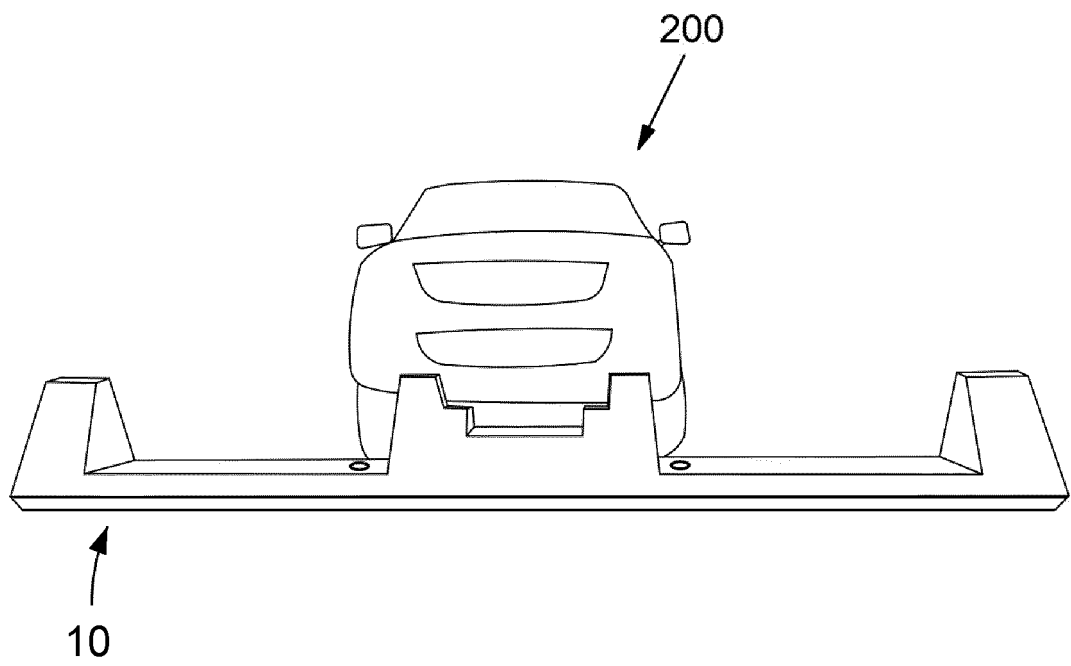


FIGURE 3

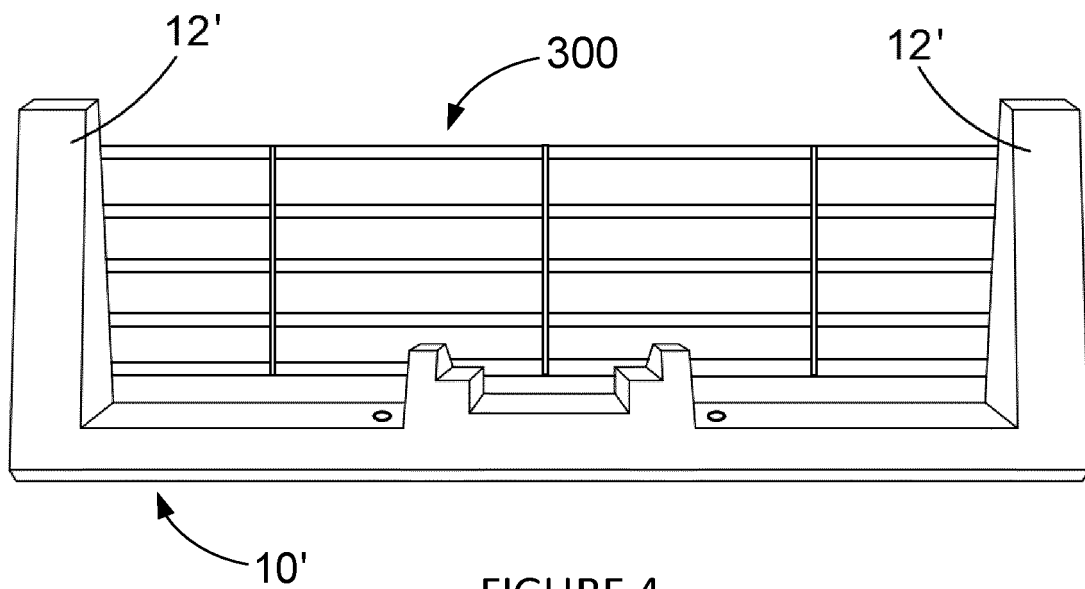


FIGURE 4



EUROPEAN SEARCH REPORT

Application Number
EP 20 27 5085

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Place of search Munich		Date of completion of the search 31 August 2020	Examiner Giannakou, Evangelia
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