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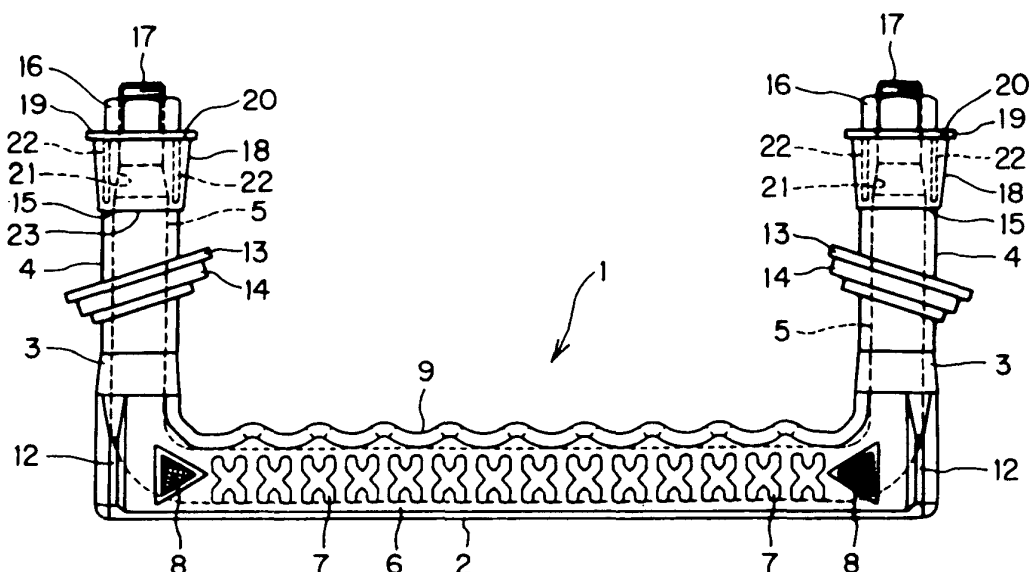
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(54) **Foothold for a manhole or the like**

(57) Legs (4) of the foothold (1) are retained by or fitted securely and easily in holes bored in a concrete wall such as a manhole or the like so that the foothold (1) can be securely fixed to the wall of the manhole or the like and a person utilizing the foothold (1) can safely go up and down, and the foothold (1) can be endured for a long period of use and become safe. The foothold (1) for a manhole or the like comprising slip prevention patterns (7) formed at the tread (2), reflectors (8) pro-

vided on the tread (2) at portions close to both ends thereof while sandwiching the slip prevention patterns (7), a wave-shaped grip portion (9) provided on the tread (2) at an inner side thereof in the axial direction and another wave-shaped grip portion (11) having irregularities (10) and provided at a lower surface of the tread (2) in the axial direction, and collars (14, 14) integrally formed with the synthetic resin (6) and provided at boundary portions between the side portions (3) and the legs (4) capable of contacting the concrete wall.

FIG. 1



Description

[0001] The present invention relates to a foothold for a manhole or the like comprising a tread, side portions positioned at both sides of the tread and legs to be inserted into a concrete wall.

[0002] For a foothold for a manhole or the like comprising a tread, side portions positioned at both sides of the tread and legs to be inserted into a concrete wall, there is a conventional one as disclosed, for example, in Japanese Patent Laid-Open publication No. 2000-144776, wherein a foothold for a manhole or the like comprises a tread, side portions positioned at both sides of the tread, legs connected to free ends of the side portions for insertion into a concrete wall, said tread, side portions and legs being integrally formed of a core and a synthetic resin for covering the core, said upper surface of the tread having slip prevention patterns, reflectors provided on the cornered-portions between the tread and the side portions, a wave-grip portion formed on the tread at the inner side of the tread in the axial direction, another wave-griped portion provided on the lower surface of the tread in the axial direction, belt-shaped projections formed on the side portions along the outer end portions in the axial direction, wherein the legs of the foothold are fixed to attachment members to be embedded in the manhole wall.

[0003] However, in this foothold for a manhole or the like, since the reflectors are provided at the cornered portions between the tread and the side portions, the belt-shaped projection are forced to be formed on the end portions or outer sides of the side portions, while entrance grooves are needed to be formed between the front ends of the side portions and the front end of the belt-shaped projections for attaching the reflectors on the cornered-portions between the tread and the side portions, it is not easily to integrally form the tread, the side portions, the legs and the core by the synthetic resin. Further, the strength of fixation of the belt-shaped projections relative to the side portions becomes weak. Accordingly, there is a likelihood that person utilizing the foothold can not use it with safety.

[0004] The invention has been developed in view of the foregoing problems of the prior art, and the object of the invention is to provide a foothold for a manhole or the like having a tread provided with reflectors thereon without impairing an efficient slip-prevention function on the tread so as to surely and easily secure the legs of the foothold to holes defined in a concrete wall such as a manhole. As a result, the foothold can be securely fitted to the wall of a manhole, and person utilizing the foothold can use it safely, and also the foothold is enduring in use for a long period of time.

[0005] To achieve the above object, the foothold of the invention comprises a tread, side portions positioned at both sides of the tread, legs connected to free ends of the side portions for insertion into a concrete wall, said tread, side portions and legs being integrally formed of

a core, and a synthetic resin for covering the core, and said upper surface of the tread having slip prevention patterns at the entire surface thereof, reflectors provided on the tread at portions close to both ends thereof while sandwiching the slip prevention pattern, a wave-shaped grip portion provided on the tread at an inner side thereof in the axial direction and another wave-shaped grip portion having irregularities and provided at a lower surface of the tread in the axial direction, characterized in that the foothold further comprises collars integrally formed with the synthetic resin and provided at boundary portions between the side portions and the legs capable of contacting the concrete wall.

FIG. 1 is a plan view of a foothold according to the invention;

FIG. 2 is a front view of the foothold in FIG. 1;

FIG. 3 is a side view of the foothold in FIG. 1; and

FIG. 4 is a perspective rear view of the foothold.

[0006] A foothold for a manhole or the like according to a preferred embodiment of the invention is described with reference to FIGS. 1 to 4.

[0007] In FIGS. 1 to 4, a reference numeral 1 depicts an entire configuration of a foothold. The foothold 1 comprises a tread 2, side portions 3, 3 positioned at both sides of the tread 2, and legs 4, 4 embedded in and fixed to a concrete wall. These tread 2, side portions 3, 3 and legs 4, 4 are formed of a core 5 made of iron and have a substantial U-shape as viewed from the plane and a synthetic resin 6 such as polypropylene covers the core 5 for keeping the core 5 from rusting.

[0008] Slip prevention patterns 7, 7 ... are formed on the entire upper surface of the tread 2 so that a person can go up and down the tread 2 safely even if the person places his or her feet on the tread 2 at any portions thereof.

[0009] Reflectors 8,8 having conspicuous color, e. g., red are provided on the tread at portions close to both ends thereof within the side portions 3, 3 while sandwiching the slip prevention patterns 7, 7 ..., thereby making the presence of the tread 2 clear so that the person can go up and down the tread 2 safely.

[0010] A wave-shaped grip portion 9 is provided on the tread 2 at the inner side thereof in the axial direction thereof. Another wave-shaped grip portion 11 having the irregularities 10 at the surface is formed on the tread 2 at the lower surface thereof in an axial direction thereof.

[0011] In this case, although it is normally conceived that the person goes up and down the tread 2 while gripping the foothold 1 by his or her both hands that is positioned several stages above the foothold 1 on which the feet of the person are placed, the tread 2 can be easily gripped because the wave shape is formed on the inner side of the tread 2 in the axial direction. Still further, since the tread 2 has the wave-shaped grip portion 11 having the irregularities 10 which is formed on the lower surface of the tread 2 in the axial direction, both hands

can be prevented from slipping so that the person can go up and down the tread 2 safely.

[0012] Belt-shaped projections 12, 12 are formed integrally with the synthetic resin 6 on the upper surfaces of the side portions side portions 3, 3 in the axial direction. With the provision of these projections 12, 12, a person can place his or her feet on the tread 2 safely without placing his or her feet on the side portions 3, 3, thereby providing a reliable foothold 1 enabling the working safely, integrally formed easily, and strong in attachment strength of the belt-shaped projections.

[0013] Collars 14, 14 are integrally formed of the synthetic resin 6 at boundary portions between the side portions 3, 3 and the legs 4, 4 under the side portions 3, 3 so as to bring into contact with a concrete wall (not shown) such as a manhole wall by way of packing made of resin so that the collars 14, 14 are brought into contact with the concrete wall to support the foothold 1 when fixing the foothold 1 to the concrete wall, and the length of the side portions 3, 3 to be embedded in the concrete wall is determined. An outer diameter of each packing 13 is larger than that of each collar 14.

[0014] Stepped parts 15, 15 are formed on the synthetic resin 6 for covering a part of the legs 4, 4 at the tip end portions, and cores are extended from the synthetic resin 6. Formed on the tip ends of the extended portion are screw sections 17, 17 to screw with stainless nuts 16, 16. Resin spacers 18, 18 and stainless washers 19, 19 forming a water stop packing are provided in the embedded portion of the concrete wall are inserted into the extension portions of the core 5, thereby fastening the nuts 16, 16.

[0015] Each resin spacer 18 is conical in an outer shape, and it has a large diameters face 20 and a plurality of holes 22, 22 ... are defined in the circumference of a through hole 21 of the 20. Each small diameter face 23 is brought into contact with each stepped part 15.

[0016] With the foregoing construction of the foothold 1, the packing 4, 4, the packings 13, 13 which are first inserted into the holes bored in the concrete wall serving as an inner wall of a manhole or the like, are inserted into the holes of the concrete wall so that the collars 14, 14 are brought into contact with the concrete wall by way of the packings 13, 13, then the spacers 18, 18 and the washers 19, 19 are inserted into the extension portion of the legs 4, 4 from the outer wall surface side of the manhole or the like, thereby fastening the nuts 16, 16. When the nuts 16, 16 are fastened, the spacers 18, 18 are brought into contact with and pressed by the stepped parts 15, 15 so that they are brought into intimate contact with each other and the conical portions of the spacers 18, 18 are pressed and fitted in the holes of the concrete wall. In such a manner, the foothold 1 is fixed watertightly and strongly to the holes of the manhole walls.

[0017] Accordingly, to the foothold of the invention, the reflectors are provided on the tread without impairment of an effective slip prevention and the legs of the

foothold are retained by or fitted securely and easily in the holes bored in the concrete wall such as a manhole or the like so that the foothold can be securely fixed to the wall of the manhole or the like and a person utilizing the foothold can safely go up and down, and the foothold can be endured for a long period of use and become safe.

[0018] The features disclosed in the foregoing description, in the claim and / or in the accompanying drawings may, both separately and in any combination thereof, be material for realising the invention in diverse forms thereof.

Claims

1. A foothold (1) for a manhole or the like comprising a tread (2), side portions (3) positioned at both sides of the tread (2), legs (4) connected to free ends of the side portions (3) for insertion into a concrete wall, said tread (2), side portions (3) and legs (4) being integrally formed of a core (5), and a synthetic resin (6) for covering the core (5), and said upper surface of the tread (2) having slip prevention patterns (7) at the entire surface thereof, reflectors (8) provided on the tread (2) at portions close to both ends thereof while sandwiching the slip prevention patterns (7), a wave-shaped grip portion (9) provided on the tread (2) at an inner side thereof in the axial direction and another wave-shaped grip portion (11) having irregularities (10) and provided at a lower surface of the tread (2) in the axial direction, **characterized in that** the foothold further comprises collars (14, 14) integrally formed with the synthetic resin (6) and provided at boundary portions between the side portions (3) and the legs (4) capable of contacting the concrete wall.

FIG. 1

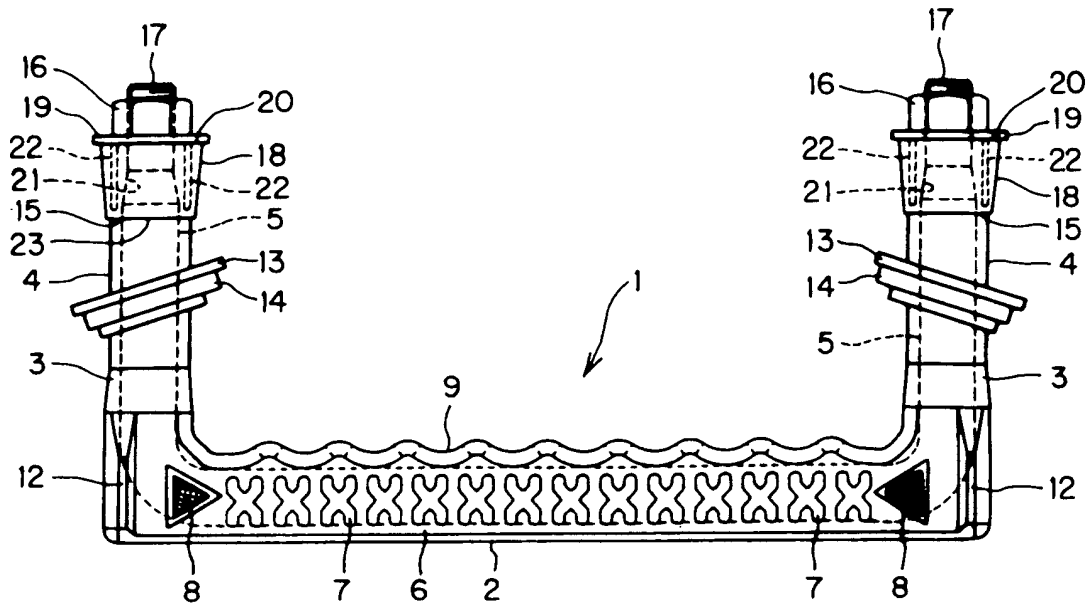


FIG. 2

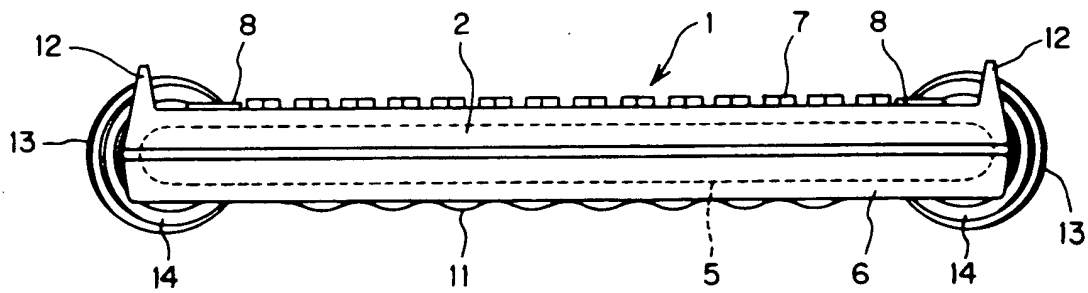


FIG. 3

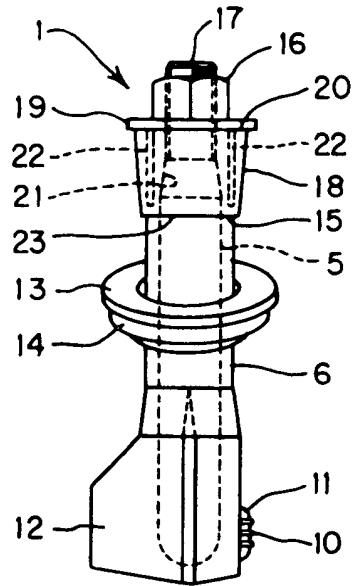
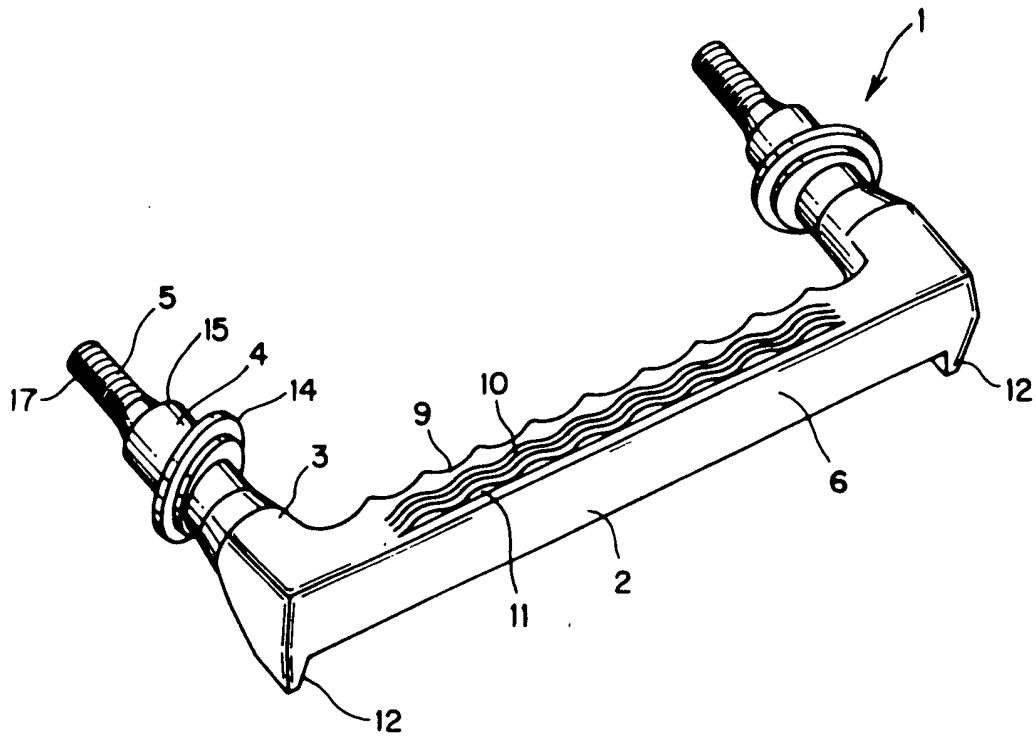


FIG. 4





European Patent
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EUROPEAN SEARCH REPORT

Application Number
EP 01 11 5178

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The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (Int.Cl.7)
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Place of search		Date of completion of the search	Examiner
THE HAGUE		14 June 2002	Demeester, J
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

EPC FORM 1503 03-82 (P04001)

**ANNEX TO THE EUROPEAN SEARCH REPORT
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EP 01 11 5178

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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