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(54) **DEVICE FOR MOUNTING AN ACCESS COVER**

EINRICHTUNG ZUR MONTAGE EINER SCHACHTABDECKUNG

SYSTEME POUR LE MONTAGE D'UNE TRAPPE D'ACCES

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Description

[0001] The present invention relates to a device for mounting an access cover, such as a manhole cover, in a wearing surface.

[0002] For the avoidance of doubt by the term wearing surface is meant any surface, such as roads and pavements, which require periodic resurfacing.

[0003] Access covers are a common feature of road and pavement surfaces and provide access to underground services and installations, such as sewage, telephone, electrical, gas and water installations. The access cover generally resides in a supporting frame which is formed from cast iron and extends down into the foundations beneath the road or pavement and may be set therein with concrete or a similar material.

[0004] The level at which the frame is set into the foundation is chosen such that, with the access cover residing in the frame, the upper surface of the access cover lies substantially flush with the road surface. Due to wear from traffic, road and pavement surfaces require periodic resurfacing.

[0005] Resurfacing of the wearing surface may be effected either by planing down the original surface followed by laying a new surface at substantially the same level as the original surface or by simply laying a new surface on the existing surface.

[0006] In the former case the cutting gear of the planing apparatus may collide with the upper part of the support frame, damaging both the cutting gear and the support frame. It will be appreciated that it is also difficult to work around the protruding parts. Furthermore, once the road or pavement surface has been planed, parts of the supporting frame which stand proud of the surface pose a major safety hazard to traffic. In the latter case, in order to raise the access cover to the level of the new road or pavement surface, the support frame needs to be dug up and reset at the new higher level. This is clearly time consuming and expensive.

[0007] DE-B-1 484 888 relates to a vertically adjustable mounting frame for a manhole cover.

[0008] Accordingly, in a first aspect the present invention provides a device for mounting an access cover in a wearing surface, for example a road surface, having a wear course overlying a base course, the device comprising a service frame in which the cover is removably received, a main frame for mounting below the base course, the main frame being made up of one or more stackable frames each frame having an upwardly extending wall portion and an inwardly extending flange portion at a base thereof and a recess formed around an outer lower edge, which recess is co-operable with the upper part of a wall portion of another stackable frame, and support means to support the service frame on the main frame at a first position at which, in use, a top surface of the access cover is substantially flush with the top surface of the wearing course, wherein removal and/or adjustment of the support means enables the

service frame to be moved relative to the main frame to a second position at which, in use, the top surface of the access cover is substantially flush with the bottom surface of the base course, and wherein the service frame is an open annular or rectangular frame having at a base thereof an outwardly extending flange.

[0009] The main frame preferably has a squarish horizontal cross-section, wherein four equally spaced recesses are provided in the flange portion thereof at positions approximately midway along the four sides.

[0010] The support means preferably comprises four equal and separate diagonally asymmetrical collar quarters, each collar quarter having a cut-out portion, wherein the cut-out portions are out of alignment with respect to the recesses in the flange portion of the main frame. One or more extension collars are preferably located on a top portion of the main frame.

[0011] In a second aspect of the present invention there is provided a device for mounting an access cover in a wearing surface, for example a road surface, having a wear course overlying a base course, the device comprising a service frame in which the cover is removably received, a main frame for mounting below the base course, and support means to support the service frame on the main frame at a first position at which, in use, a top surface of the access cover is substantially flush with the top surface of the wearing course, wherein removal and/or adjustment of the support means enables the service frame to be moved relative to the main frame to a second position at which, in use, the top surface of the access cover is substantially flush with the bottom surface of the base course, and wherein one or more extension collars is/are located on a top portion of the main frame, and wherein the service frame is an open annular or rectangular frame having at a base thereof an outwardly extending flange.

[0012] In both aspects of the present invention, the service frame is an open annular or rectangular frame having at a base thereof an outwardly extending flange. The service frame typically has a height of from about 8 cm to 18 cm, more typically from about 10 cm to about 16 cm. The access cover is preferably removably received in the service frame, but may also be hingedly connected thereto.

[0013] In the second aspect of the present invention, the main frame is preferably an open annular or rectangular frame having at a base thereof an inwardly extending flange. In the second aspect, more than one main frame may be provided depending on the depth of the access hole. In this case the two or more main frames are designed to be stackable on top of one another. In both the first and second aspects, the main frame advantageously surrounds the service frame at the second position. It will be appreciated that in both the first and second aspects of the present invention, the distance the main frame extends vertically may be adjusted by providing grout, cement or other packing material between a bottom surface thereof and the ground there-

below.

[0014] In both the aspects of the present invention, the service frame is supported on the main frame by support means. The support means are adjustable and/or removable. Adjustment and/or removal of the support means enables the service frame to be moved relative to the main frame to a plurality of positions including the first and second positions.

[0015] Preferably the support means comprises one or more collars, preferably disposed between an upper surface of the flange of the main frame and a lower surface of the flange of the service frame. The height of the one or more collars relative to the main frame may be adjusted by providing grout, cement or other packing material between a bottom surface thereof and the upper surface of the flange of the main frame. The one or more collars may comprise separable segments.

[0016] The height of the service frame relative to the support means may be adjusted by providing grout, cement or other packing material between a bottom surface thereof and an upper surface of the support means.

[0017] The support means preferably further comprises a height-adjustable spacer element. In this case, the height-adjustable spacer element preferably comprises a collar and wedge arrangement, a collar having one or more adjustable screws running therethrough, or one or more hydraulic jacks or rams or a combination thereof.

[0018] The device according to the present invention may further comprise one or more extension collars located on a top portion of the main frame and/or one or more spacer elements located on a top portion of the service frame.

[0019] The vertical distance between the top surface of the access cover at the first position and the top surface thereof at the second position is preferably from about 6cm to about 14cm, more preferably from about 8cm to about 12cm, still more preferably about 10cm. Accordingly, in moving from the first position to the second position, the service frame is displaced by a vertical distance of preferably from about 6cm to about 14cm.

[0020] The present invention also provides for a method of resurfacing a wearing surface having a wear course overlying a base course, wherein a device as herein described is sited in the wearing surface, the method comprising the steps of:

(a) removing and/or adjusting the support means such that the service frame is in the second position;

(b) planing down the wear and base courses to the desired depth;

(c) reinserting and/or adjusting the support means such that the top surface of the access cover will be substantially flush with the top surface of the base course to be laid;

(d) laying the base course;

(e) adjusting the support means such that the service frame will be at substantially the first position when the wear course is laid; and

(f) laying the wear course.

[0021] In an alternative embodiment, the present invention provides a method of laying a new wear surface on a wearing surface having a wear course overlying a base course, wherein a device as herein described is sited in the wearing surface, the method comprising the steps of:

(a) adjusting the support means to raise the service frame to a level at which the top surface of the access cover will be substantially flush with the top surface of the new wear course to be laid; and
(b) laying the wear course.

[0022] It will be appreciated that the device as herein described can be substituted for existing conventional devices when the time comes to resurface a road or pavement, for example. All that is required is for a template to be placed over the existing manhole frame and for the road or pavement layers to be cut to the desired depth. Thereafter, the manhole brickwork and arisings can be removed and the new device positioned in place in the manner as described above.

[0023] The present invention will now be further described with reference to the following drawings in which:

Figure 1 is a schematic vertical cross-sectional half view of a device according to the present invention; Figure 2 is a plan view of a collar of the height-adjustable spacer element of the support means; Figure 3 is a vertical cross-section through line AA' of the plan view illustrated in Figure 2 showing tapered recesses in the collar of the height-adjustable spacer element; Figure 4 is a plan view of an alternative base collar of the support means; Figure 5 is a vertical cross-sectional illustration of a main frame for use with the base collar of Figure 4; Figure 6 is a plan view of an alternative main frame according to the present invention which is adapted to be stackable; Figure 7 is a vertical cross-section through line BB' of the plan view illustrated in Figure 6; and Figure 8 is a plan view of an alternative support means collar for use with the main frame illustrated in Figures 6 and 7.

[0024] In Figure 1, a device 1 according to the present invention is shown sited in a road 5. The vertical cross-sectional view shows one half of the device 1 and the other half is simply a mirror image of this half about the dashed centre line of the access hole 15.

[0025] The device 1 comprises a main frame 20 formed from concrete and having an open rectangular form with an upwardly extending wall portion 21 and an inwardly extending flange portion 22 at its base. The main frame 20 has a squarish/rectangular horizontal cross-section (not shown) and the wall portion 21 thereof surrounds the access hole 15. A ridge 23 extends around the upper surface 24 of the wall portion 21 of the main frame 20 such that the outer top edge 25 is at a higher level than the inner top edge 26.

[0026] The main frame 20 sits on a service chamber 6 and the remainder of the road 5 consists of a wear course 7 (approximately 4cm depth) overlying a base course 8 (approximately 6cm depth), beneath which is a sub-base course 9. It will be appreciated that the wear 7, base 8 and sub-base 9 courses may themselves each comprise a plurality of layers.

[0027] A first extension collar 30 is located on the upper surface 24 of the wall portion 21 of the main frame 20. The first extension collar 30 extends upwards from the sub-base course 9 to the top 10 of the base course 8 and has a similar horizontal cross-section (not shown) to that of the main frame 20. The first extension collar 30 is removably located on the main frame 20 by virtue of a ridge 31 provided around its base 32, which cooperates with the ridge 23 on the upper surface 24 of wall portion 21. A ridge 33 around the upper surface 34 of the first extension collar 30 is also provided.

[0028] Removably located on the upper surface 34 of the first extension collar 30 is an optional second extension collar 40, again of similar horizontal cross-section (not shown) to that of the main frame 20. The second extension collar 40 has a similar form to that of the first extension collar 30 and extends upwards from the base course 8 to a position adjacent to the top 11 of the wear course 7. The second extension collar 40 has a ridge 41 around its base 42 which cooperates with the ridge 33 on the upper surface 34 of the first extension collar 30. A ridge 43 around the upper surface 44 of the second extension collar 40 is also provided. Both the first 30 and second 40 extension collars are formed from concrete.

[0029] The main frame 20 and the two extension collars 30 and 40 surround a service frame 50, which is formed from cast iron and is an open rectangular frame having an upwardly extending wall portion 51 and outwardly and inwardly extending flange portions, 52 and 52a, respectively, at its base. Accordingly, the service frame 50 has an inverted T-section. The service frame 50 has a squarish horizontal cross-section (not shown) and the wall portion 51 thereof defines the access hole 15. The service frame 50 has a plurality of strengthening members 53 which join the outside surface 54 of the wall portion 51 to the upper surface 55 of the flange portion 52.

[0030] Removably received in the service frame 50 is an access cover 60 which comprises a horizontally extending cover portion 61 and a downwardly extending wall portion 63. The horizontal cross-section (not

shown) of the cover portion 61 can take a variety of forms, such as circular or square, but is preferably tailored to suit the service frame 50. The base of the downwardly extending wall portion 63 rests on the upper surface 57 of flange portion 52a, and hence the access cover 60 is supported on the service frame 50. The purpose of the access cover 60 is to prevent objects falling into the access hole 15. The cover portion 61 of the access cover 60 has a top surface 62 which is substantially flush with the top surface 11 of the wear course 7.

[0031] Support means 70 are positioned between the top surface 27 of the flange portion 22 of the main frame 20 and the bottom surface 58 of the flange portion 52 of the service frame 50. The support means 70 is removable and comprises a base collar 71 and a height-adjustable spacer element 80. The base collar 71 has a squarish horizontal cross-section (not shown) and a top surface 72. The aperture in the base collar 71 coincides substantially with the access hole 15. The base collar 71 is removably located in this position by means of sand grout 100. Positioned on top of the base collar 71 is the height-adjustable spacer element 80. This also comprises a collar 81 having a squarish horizontal cross-section (not shown) and an aperture coinciding substantially with that of the base collar 71. Around the upper surface 82 of collar 81, there are one or more tapered recesses, such as that shown at 85. One or more wedges are inserted into these recesses, such as the wedge shown at 86, whereby the taper of the wedge 86 cooperates with the taper of the recess 85. The tapered recess 85 and wedge 86 are shaped such that the top surface 87 of the wedge 86 remains substantially horizontal. Lateral movement of wedge 86 in the tapered recess 85 (and the lateral movement of the other wedges in the other tapered recesses which are not shown) enables the height of the service frame 50 to be carefully adjusted. Furthermore, tilt can be catered for by laterally moving the wedges independently of one another. The bottom surface 58 of the flange portion 52 of the service frame 50 rests on the top surface 87 of the wedge 86 (and also on the top surfaces of the other wedges not shown). It will be appreciated that the service frame 50 may also be moved laterally within the main frame 20.

[0032] When the service frame 50 is at the desired height, that is when the top surface 62 of the cover portion 61 of the access cover 60 is substantially flush with the top surface 11 of the wear course 7, the service frame 50 is semi-permanently fixed in place by inserting grout, cement or other packing material in the gap between the bottom surface 58 of flange portion 52 and the top surface 82 of collar 81. Once set, wedge 86 (and the other wedges not shown) can either be removed or left in place.

[0033] In Figure 2 a plan view of the collar 81 of the height-adjustable spacer element 80 is shown. The collar 81 has four walls 83a-d which define a central squarish aperture 84. In a region in the middle of the upper surface 82 of each of the four walls 83a-d, there are ta-

pered recesses 85a-d, respectively. The recesses 85a-d extend from the outer edges 86a-d to the inner edges 87a-d of the four wall 83a-d, respectively.

[0034] Figure 3 is a vertical cross-section through line AA' showing the tapered recesses 85a and c in opposing walls 83a and c, respectively, and also the tapered recess 85d in wall 83d. The height of the tapered recesses at 83a and c decreases from the outer edges 86a and c to the inner edges 87a and c, respectively.

[0035] Figure 4 shows a plan view of a base collar 90 for use in an alternative embodiment of the removable support means 70. The base collar 90 in this embodiment of the present invention is similar to the collar illustrated in Figure 2, but with the tapered recesses removed, hence resulting in four equal and separate collar quarters 91a-d. When the collar quarters 91a-d are positioned as shown, they define a central squarish aperture 92 with regular gaps 93a-d between the collar quarters.

[0036] In Figure 5 a vertical cross-section of a main frame 20 for use with the base collar 90 of Figure 4 is shown. Four equally spaced raised sections, only three shown at 29a-c, are provided on the top surface 27 of the flange portion 22. The dimensions and positions of the raised sections 29a-c are such that they cooperate with the gaps 93a-d between the collar quarters of the base collar 90 shown in Figure 4. Accordingly, the four collar quarters 91a-d are removably located on the top surface 27 of the flange portion 22 of the main frame 20. Jacks, such as of the hydraulic type or of the spring return ram variety, can now be positioned on the top surface of each of the three raised sections 29a-c (and also on the fourth raised section not shown) and flange portion 52 of the service frame 50 rested thereon. The service frame 50 can then be raised or lowered to the desired level. With the jacks in place, grout, cement or other suitable packing material is inserted in the space between the bottom surface 58 of flange portion 52 and the top surfaces of the four collar quarters 91a-d. Once the grout or cement has set, the jacks may be removed. If the level needs to be changed again, all that is required is for the jacks to be reinserted into their former positions and for the service frame 50 to be jacked up during which process the grout or the cement is fractured and can be removed. Once at the desired new level, fresh cement or grout is inserted. As an alternative to using jacks to raise the service frame, pulling or lifting apparatus located above the service frame and releasably attached thereto may be used.

[0037] When the time comes to resurface the wearing surface, the following steps are taken with reference to Figures 1 and 2. First, the support means 70 are removed, to allow the service frame 50 to be lowered down the access hole 15 and positioned on the top surface 27 of the flange portion 22 of the main frame 20. The service frame 50 and access cover 60 are consequently conveniently located under the road surface without disturbing the road. Next, the road is planed down up to and

including the base course 8. In this process, the first 30 and second 40 extension collars are either removed or broken-up. The presence of the access cover 60 prevents objects and debris from falling down into the access hole 15.

[0038] Once the surface has been planed down to the depth required, the service frame 50 and access cover 60 are removed from the main frame 20 and the base collar 71 of the removable support means 70 is relocated on the top surface 27 of the flange 22 of the main frame 20. The service frame 50 and access cover 60 are then placed back into the main frame 20, the bottom surface 58 of the flange portion 52 resting on the top surface 72 of the base collar 71. The top surface 62 of the access cover 60 is now at substantially the height of the new base course to be laid. A replacement first extension collar 30 up to this height is now added to the main frame 20.

[0039] Once the new base course has been laid, the service frame 50 and access cover 60 are once more removed or raised from the main frame 20 and the height-adjustable spacer element 80 is relocated on the top surface 72 of the base collar 71. The service frame 50 and access cover 60 are then placed back into the main frame 20, the bottom surface 58 of the flange portion 52 resting on the top surface 82 of collar 81 or on the top surface 87 of wedge 86 (and the top surfaces of the other wedges not shown) depending upon whether or not the wedges have been inserted in the recesses. A second extension collar 40 is added to the first extension collar 30 to bring the main frame 20 to substantially the new level of the wear course to be laid. The wear course is then laid and the height of the service frame 50 can be adjusted if necessary via the wedges, such as that shown at 86, so that the top surface 62 of the access cover 60 lies substantially flush with the newly laid wear surface. It will be appreciated that tilt of the road can be catered for by adjusting the wedges by differing amounts.

[0040] When the level is correct, grout or cement or other packing material is inserted in the gap between the bottom surface 58 of the flange portion 52 of the service frame 50 and the upper surface 82 of the collar 81 of the height-adjustable spacer element 80. When this material has set, the wedges are either removed or left in place.

[0041] When the time comes again for the road to be resurfaced, the wedges are reinserted into their former positions and the service frame 50 is raised. By this process the grout or cement in the gap between the service frame 50 and collar 81 and also the base and wear course material in the space between the vertical wall 51 of the service frame 50 and the extension collars 30 and 40 are fractured. The use of the extension collars 30 and 40 obviates the need to fracture material not lying in this space, which would require significant additional force.

[0042] Alternatively, if the road is to simply have an-

other wear layer laid over the existing wear course 7, all that is required is for the service frame 50 to be raised up to and set at the new level and this is achieved in the manner as detailed above.

[0043] With regard to the support means as shown in Figures 4 and 5, the wearing surface is resurfaced in a similar manner to that described above. The adjustment of the height of the service frame 50, however, is effected through the use of hydraulic jacks, rams, pulling or lifting apparatus as hereinbefore described and the height-adjustable spacer element 80 may accordingly be dispensed with.

[0044] Referring now to Figures 6 and 7 which show an alternative embodiment of a main frame 100 which may be stacked on top of another such frame. Accordingly, depending upon the depth of the access hole, one or more of the frames 100 may be used. Like the main frame illustrated in Figures 1 and 5, main frame 100 has an upwardly extending wall portion 101 and inwardly extending flange portion 102 at its base. The main frame 100 has a squarish horizontal cross-section and the wall 101 and flange 102 portions define a central squarish aperture 103. Compared to the main frame shown in Figures 1 and 5, frame 100 is adapted to be stackable by virtue of a recess 104 formed around its outer lower edge, which, it will be appreciated, can cooperate with the upper part of a wall portion of another such frame.

[0045] Four equally spaced recesses 105a-d are provided in flange portion 102 at positions approximately midway along the four sides and these facilitate lifting of the support means and service frame (not shown) by the use of one or more levers for example.

[0046] Figure 8 shows an alternative support means collar 110 for use with the stackable main frame 100 of Figures 6 and 7. The collar 110 in this embodiment of the invention comprises four equal and separate collar quarters 111a-d. When the collar quarters 111a-d are positioned as shown, they define a central squarish aperture 112 which corresponds substantially with aperture 103 (see Figure 6). In contrast to the collar quarters of the base collar illustrated in Figure 4, collar quarters 111a-d are not diagonally symmetrical. Cut-out portions 113a-d are provided in collar quarters 111a-d respectively to facilitate lifting of the service frame (not shown) by the use of one or more levers for example. Cut-out portions 113a-d are positioned away from the centre of the four sides of the collar and, accordingly, are out of alignment with respect to recesses 105a-d (see Figures 6 and 7). In contrast to the support means illustrated in Figure 1, no height-adjustable spacer element is provided. Consequently, in this embodiment of the invention, the service frame is moved from the first position to the second position simply by removal of collar 110. Fine adjustment of the height of the service frame may be achieved by the use of grout or cement or other packing material between the various mating surfaces. Screw holes 114a-d and screws (not shown) may also be provided to enable further height and/or tilt adjustment.

[0047] The device and method of the present invention address many of the problems associated with the prior art, for example the hazard of parts of the supporting frame standing proud of the surface. The device of the present invention may be used in a variety of differently sized access holes. Inspection of the access hole is relatively simple and the device is easy to dismantle. Fine adjustment and tilt of the access cover is provided.

Claims

1. A device (1) for mounting an access cover (60) in a wearing surface, for example a road surface, having a wear course (7) overlying a base course (8), the device (1) comprising a service frame (50) in which the cover (60) is removably received, a main frame (100) for mounting below the base course, the main frame being made up of one or more stackable frames (100) each frame having an upwardly extending wall portion (101) and an inwardly extending flange portion (102) at a base thereof and a recess (104) formed around an outer lower edge, which recess (104) is co-operable with the upper part of a wall portion (101) of another stackable frame (100), and support means (70,110) to support the service frame (50) on the main frame (100) at a first position at which, in use, a top surface (62) of the access cover (60) is substantially flush with the top surface of the wearing course (7), wherein removal and/or adjustment of the support means (70,110) enables the service frame (50) to be moved relative to the main frame (100) to a second position at which, in use, the top surface (62) of the access cover (60) is substantially flush with the bottom surface of the base course (8), and wherein the service frame (50) is an open annular or rectangular frame having at a base thereof an outwardly extending flange (52).
2. A device (1) as claimed in claim 1, wherein the main frame (100) has a squarish horizontal cross-section and wherein four equally spaced recesses (105a-d) are provided in the flange portion (102) thereof at positions approximately midway along the four sides.
3. A device (1) as claimed in claim 2, wherein the support means (110) comprises four equal and separate diagonally asymmetrical collar quarters (111a-d), each collar quarter (110a-d) having a cut-out portion (113a-d), wherein the cut-out portions (113a-d) are out of alignment with respect to the recesses (105a-d) in the flange portion (102) of the main frame (100).
4. A device (1) as claimed in any one of the preceding claims, further comprising one or more extension

collars (30,40) located on a top portion of the main frame (100).

5. A device (1) for mounting an access cover (60) in a wearing surface, for example a road surface, having a wear course (7) overlying a base course (8), the device (1) comprising a service frame (50) in which the cover (60) is removably received, a main frame (20,100) for mounting below the base course (8), and support means (70,110) to support the service frame (50) on the main frame (20,100) at a first position at which, in use, a top surface (62) of the access cover (60) is substantially flush with the top surface of the wearing course (7), wherein removal and/or adjustment of the support means (70,110) enables the service frame (50) to be moved relative to the main frame (20,100) to a second position at which, in use, the top surface (62) of the access cover (60) is substantially flush with the bottom surface of the base course (8), and wherein one or more extension collars (30,40) is/are located on a top portion of the main frame (20,100), and wherein the service frame (50) is an open annular or rectangular frame having at a base thereof an outwardly extending flange (52).
6. A device (1) as claimed in any one of the preceding claims, wherein the support means (70,110) comprises one or more collars (71,111a-d) or one or more height-adjustable spacer elements (80) or a combination thereof.
7. A device (1) as claimed in claim 5, wherein the main frame (20,100) is an open annular or rectangular frame having at a base thereof an inwardly extending flange (22,102).
8. A device (1) as claimed in any one of claims 1 to 4 and 7, wherein the support means (70,110) comprises one or more collars (71,111a-d) disposed between an upper surface (27) of the flange (22) of the main frame (20,100) and a lower surface (58) of the flange (52) of the service frame (50).
9. A device (1) as claimed in any one of the preceding claims, wherein the main frame (20,100) surrounds the service frame (50) at the second position.
10. A device (1) as claimed in claim 6 or claim 8, wherein the one or more collars (71,111a-d) comprise separable segments.
11. A device (1) as claimed in any one of claims 6 to 10, wherein the support means (70) further comprises a height-adjustable spacer element (80).
12. A device (1) as claimed in claim 11, wherein the height-adjustable spacer element (80) comprises a

collar (81) and wedge (86) arrangement, a collar having one or more adjustable screws running therethrough, or one or more hydraulic jacks or rams or a combination thereof.

13. A device (1) as claimed in any one of the preceding claims, wherein grout, cement or packing material is provided between a bottom surface of the main frame (20,100) and the ground therebelow.
14. A device (1) as claimed in any one of the preceding claims, wherein grout, cement or packing material is provided between the support means (70,110) and the main frame (20,100).
15. A device (1) as claimed in any one of the preceding claims, wherein grout, cement or packing material is provided between the service frame 50 and the support means (70,110).
16. A device (1) as claimed in any one of the preceding claims, further comprising one or more spacer elements located on a top portion of the service frame (50).
17. A device (1) as claimed in any one of the preceding claims, wherein the vertical distance between the top surface (62) of the access cover (60) at the first position and the top surface (62) thereof at the second position is from 6 cm to 14 cm, preferably from 8 cm to 12 cm, more preferably approximately 10 cm.
18. A device (1) as claimed in any one of claims 5 to 17, wherein the main frame (100) is made up of one or more stackable frames (100) each having an upwardly extending wall portion (101) and an inwardly extending flange portion (102) at a base thereof and a recess (104) formed around an outer lower edge, which recess is co-operable with the upper part of a wall portion (101) of another stackable frame (100).
19. A method of resurfacing a wearing surface having a wear course (7) overlying a base course (8), wherein a device (1) as claimed in any one of the preceding claims is sited in the wearing surface, the method comprising the steps of:
 - (a) removing and/or adjusting the support means (70,110) such that the service frame (50) is in the second position;
 - (b) planing down the wear (7) and base (8) courses to the desired depth;
 - (c) reinserting and/or adjusting the support means (70,110) such that the top surface (62)

of the access cover (60) will be substantially flush with the top surface of the base course to be laid;

(d) laying the base course (8) ;

(e) adjusting the support means (70,110) such that the service frame (50) will be at substantially the first position when the wear course is laid; and

(f) laying the wear course (7).

20. A method of laying a new wear surface on a wearing surface having a wear course (7) overlying a base course (8), wherein a device (1) as claimed in any one of claims 1 to 18 is sited in the wearing surface, the method comprising the steps of:

(a) adjusting the support means (70,110) to raise the service frame (50) to a level at which the top surface (62) of the access cover (60) will be substantially flush with the top surface of the new wear course to be laid; and

(b) laying the wear course (7).

Patentansprüche

1. Vorrichtung (1) zur Montage eines Schachtdeckels (60) in einer Verschleißfläche, beispielsweise einer Straßenfläche, die eine über einer Basisschicht (8) liegende Verschleißschicht (7) aufweist, wobei die Vorrichtung (1) umfasst: einen Servicerahmen (50), in dem der Deckel (60) entfernbar aufgenommen ist, einen Hauptrahmen (100) zur Montage unter der Basisschicht, wobei der Hauptrahmen aus einem oder mehreren stapelbaren Rahmen (100) aufgebaut ist, wobei jeder Rahmen einen nach oben abstehenden Wandabschnitt (101) und einen nach innen abstehenden Flanschabschnitt (102) an seiner Basis sowie eine um einen äußeren Unterrand herum ausgebildete Vertiefung (104) aufweist, wobei die Vertiefung (104) mit dem Oberteil eines Wandabschnitts (101) eines anderen stapelbaren Rahmens (100) zusammenwirken kann, sowie ein Stützmittel (70, 110) zum Stützen des Servicerahmens (50) auf dem Hauptrahmen (100) in einer ersten Position, in der bei Verwendung eine Oberseite (62) des Schachtdeckels (60) im Wesentlichen mit der Oberseite der Verschleißschicht (7) fluchtet, worin das Entfernen und/oder die Einstellung des Stützmittels (70, 110) eine Bewegung des Servicerahmens (50) relativ zu dem Hauptrahmen (100) in eine zweite Position ermöglicht, in der bei Verwendung die Oberseite (62) des Schachtdeckels (60) im Wesentlichen mit der Unterseite der Basis-

schicht (8) fluchtet, und worin der Servicerahmen (50) ein offener ringförmiger oder rechteckiger Rahmen ist, der an seiner Basis einen nach außen abstehenden Flansch (52) aufweist.

2. Vorrichtung (1) nach Anspruch 1, worin der Hauptrahmen (100) einen quadratischen horizontalen Querschnitt aufweist und worin in dessen Flanschabschnitt (102) an Positionen angenähert in der Längsmittle der vier Seiten vier mit gleichem Abstand angeordnete Vertiefungen (105a-d) vorgesehen sind.

3. Vorrichtung (1) nach Anspruch 2, worin das Stützmittel (110) vier gleiche und separate, diagonal asymmetrische Kragenviertel (111a-d) aufweist, wobei jedes Kragenviertel (110a-d) einen Ausschnitt (113a-d) aufweist, worin die Ausschnitte (113a-d) in Bezug auf die Vertiefungen (105a-d) in dem Flanschabschnitt (102) des Hauptrahmens (100) außer Flucht sind.

4. Vorrichtung (1) nach einem der vorhergehenden Ansprüche, die ferner einen oder mehrere Verlängerungskrägen (30, 40) aufweist, die an einem Oberteil des Hauptrahmens (100) angeordnet sind.

5. Vorrichtung (1) zur Montage eines Schachtdeckels (60) in einer Verschleißfläche, beispielsweise einer Straßenfläche, die eine über einer Basisschicht (8) liegende Verschleißschicht (7) aufweist, wobei die Vorrichtung umfasst: einen Servicerahmen (50), in dem der Deckel (60) entfernbar aufgenommen ist, einen Hauptrahmen (20, 100) zur Montage unter der Basisschicht (89) sowie ein Stützmittel (70, 110) zum Stützen des Servicerahmens (50) auf dem Hauptrahmen (20, 100) in einer ersten Position, in der bei Verwendung eine Oberseite (62) des Schachtdeckels (60) mit der Oberseite der Verschleißschicht (7) im Wesentlichen fluchtet, worin ein Entfernen und/oder Einstellen des Stützmittels (70, 110) eine Bewegung des Servicerahmens (50) relativ zu dem Hauptrahmen (20, 100) zu einer zweiten Position ermöglicht, in der bei Verwendung die Oberseite (62) des Schachtdeckels (60) mit der Unterseite der Basisschicht (8) im Wesentlichen fluchtet, und worin ein oder mehrere Verlängerungskrägen (30, 40) auf dem Oberteil des Hauptrahmens (20, 100) angeordnet ist/sind, und worin der Servicerahmen (50) ein offener ringförmiger oder rechteckiger Rahmen ist, der an seiner Basis einen nach außen abstehenden Flansch (52) aufweist.

6. Vorrichtung (1) nach einem der vorhergehenden Ansprüche, worin das Stützmittel (70, 110) einen oder mehrere Krägen (71, 111a-d) oder einen oder mehrere höhenverstellbare Abstandshalterelemen-

te (80) oder eine Kombination davon umfasst.

7. Vorrichtung (1) nach Anspruch 5, worin der Haupt-
rahmen (20, 100) ein offener ringförmiger oder
rechteckiger Rahmen ist, der an seiner Basis einen
nach innen abstehenden Flansch (22, 102) auf-
weist. 5
8. Vorrichtung (1) nach einem der Ansprüche 1 bis 4
und 7, worin das Stützmittel (70, 110) einen oder
mehrere Krägen (71, 111a-d) aufweist, die zwi-
schen einer Oberseite (27) des Flanschs (22) des
Hauptrahmens (20, 100) und einer Unterseite (58)
des Flanschs (52) des Servicerahmens (50) ange-
ordnet ist/sind. 10 15
9. Vorrichtung (1) nach einem der vorhergehenden
Ansprüche, worin der Hauptrahmen (20, 100) den
Servicerahmen (50) an der zweiten Position um-
gibt. 20
10. Vorrichtung (1) nach Anspruch 6 oder Anspruch 8,
worin der eine oder die mehreren Krägen (71, 111a-
d) separierbare Segmente aufweist/aufweisen. 25
11. Vorrichtung (1) nach einem der Ansprüche 6 bis 10,
worin das Stützmittel (70) ferner ein höhenverstell-
bares Abstandshalterelement (80) aufweist.
12. Vorrichtung (1) nach Anspruch 11, worin das höhen-
verstellbare Abstandshalterelement (80) eine Kragen-
(81)- und Keil (86)-Anordnung aufweist, wobei
der Kragen eine oder mehrere ihn durchsetzende
einstellbare Schrauben oder einen oder mehrere
Hydraulikheber oder -stößel oder eine Kombination
davon aufweist. 30 35
13. Vorrichtung (1) nach einem der vorhergehenden
Ansprüche, worin zwischen einer Unterseite des
Hauptrahmens (20, 100) und dem darunter befind-
lichen Boden Mörtel, Zement oder Packungsmateri-
al vorgesehen ist. 40
14. Vorrichtung (1) nach einem der vorhergehenden
Ansprüche, worin zwischen dem Stützmittel (70,
110) und dem Hauptrahmen (20, 100) Mörtel, Ze-
ment oder Packungsmaterial vorgesehen ist. 45
15. Vorrichtung (1) nach einem der vorhergehenden
Ansprüche, worin zwischen dem Servicerahmen
(50) und dem Stützmittel (70, 110) Mörtel, Zement
oder Packungsmaterial vorgesehen ist. 50
16. Vorrichtung (1) nach einem der vorhergehenden
Ansprüche, die ferner einen oder mehrere Ab-
standshalterelemente aufweist, die an einem Ober-
teil des Servicerahmens (50) angeordnet sind. 55

17. Vorrichtung (1) nach einem der vorhergehenden
Ansprüche, worin der vertikale Abstand zwischen
der Oberseite (62) des Schachtdeckels (60) in der
ersten Position und dessen Oberseite (62) in der
zweiten Position von 6 cm bis 14 cm, bevorzugt von
8 cm bis 12 cm, noch bevorzugter angenähert 10
cm, beträgt.

18. Vorrichtung (1) nach einem der Ansprüche 5 bis 17,
worin der Hauptrahmen (100) aus einem oder mehr-
eren stapelbaren Rahmen (100) aufgebaut ist, die
jeweils einen nach oben abstehenden Wandabs-
chnitt (101) und einen nach innen abstehenden
Flanschabschnitt (102) an ihrer Basis sowie eine
um einen äußeren Unterrand herum ausgebildete
Vertiefung (104) aufweisen, wobei die Vertiefung
mit dem Oberteil eines Wandabschnitts (101) eines
anderen stapelbaren Rahmens (100) zusammen-
wirken kann.

19. Verfahren zum Erneuern einer Verschleißfläche,
die eine über einer Basisschicht (8) liegende Ver-
schleißschicht (7) aufweist, worin die Vorrichtung
(1) nach einem der vorhergehenden Ansprüche in
der Verschleißfläche sitzt, wobei das Verfahren die
Schritte aufweist:

(a) Entfernen und/oder Einstellen des Stützmit-
tels (70, 110) derart, dass sich der Servicerah-
men (50) in der zweiten Position befindet;

(b) Abheben der Verschleiß (7)- und Basis (8)-
Schichten auf eine gewünschte Tiefe;

(c) Wiedereinsetzen und/oder Einstellen des
Stützmittels (70, 110) derart, dass die Obersei-
te (62) des Schachtdeckels (60) mit der Ober-
seite der zu verlegenden Basisschicht im We-
sentlichen fluchtet;

(d) Verlegen der Basisschicht (8);

(e) Einstellen des Stützmittels (70, 110) derart,
dass sich der Servicerahmen (50) im Wesent-
lichen in der ersten Position befindet, wenn die
Verschleißschicht verlegt wird; und

(f) Verlegen der Verschleißschicht (7).

20. Verfahren zum Verlegen einer neuen Verschleißflä-
che auf einer Verschleißfläche, die eine über einer
Basisschicht (8) liegende Verschleißschicht (7) auf-
weist, worin eine Vorrichtung (1) nach einem der
Ansprüche 1 bis 18 in der Verschleißfläche sitzt,
wobei das Verfahren die Schritte umfasst:

(a) Einstellen des Stützmittels (70, 110) zum
Anheben des Servicerahmens (50) auf ein Ni-

veau, in dem die Oberseite (62) des Schachtdeckels (60) mit der Oberseite der zu verlegenden neuen Verschleißschicht im Wesentlichen fluchtet; und

(b) Verlegen der Verschleißschicht (7).

Revendications

1. Dispositif (1) pour monter une trappe d'accès (60) dans une surface de roulement, par exemple une surface routière, ayant une couche de roulement (7) recouvrant une couche de base (8), le dispositif (1) comprenant un cadre de service (50) dans lequel la trappe (60) est reçue de manière amovible, un cadre principal (100) pour montage en dessous de la couche de base, le cadre principal étant constitué d'un ou plusieurs cadres empilables (100), chaque cadre ayant une partie de paroi (101) s'étendant vers le haut et une partie de rebord (102) s'étendant vers l'intérieur au niveau de sa base et un évidement (104) formé autour d'un bord inférieur externe, lequel évidement (104) peut coopérer avec la partie supérieure d'une partie de paroi (101) d'un autre cadre empilable (100), et un moyen de support (70, 110) pour supporter le cadre de service (50) sur le cadre principal (100) à une première position à laquelle, en utilisation, une surface supérieure (62) de la trappe d'accès (60) est sensiblement à niveau de la surface supérieure de la couche de roulement (7), dans lequel l'enlèvement et/ou l'ajustement du moyen de support (70, 110) permet au cadre de service (50) d'être déplacé par rapport au cadre principal (100) à une seconde position à laquelle, en utilisation, la surface supérieure (62) de la trappe d'accès (60) est sensiblement à niveau avec la surface inférieure de la couche de base (8), et dans lequel le cadre de service (50) est un cadre annulaire ou rectangulaire ouvert ayant au niveau de sa base un rebord (52) s'étendant vers l'extérieur.
2. Dispositif (1) selon la revendication 1, dans lequel le cadre principal (100) présente une section transversale horizontale carrée et dans lequel quatre évidements également espacés (105a à d) sont disposés dans sa partie de rebord (102) à des positions à approximativement mi-chemin le long des quatre côtés.
3. Dispositif (1) selon la revendication 2, dans lequel le moyen de support (110) comprend quatre quarts de colliers égaux et séparés asymétriques en diagonale (111a à d), chaque quart de collier (110a à d) ayant une partie découpée (113a à d), dans lequel les parties découpées (113a à d) sont hors d'alignement par rapport aux évidements (105a à d) dans la partie de rebord (102) du cadre principal

(100).

4. Dispositif (1) selon l'une quelconque des revendications précédentes, comprenant en outre, un ou plusieurs colliers d'extension (30, 40) positionnés sur une partie supérieure du cadre principal (100).
5. Dispositif (1) pour montage d'une trappe d'accès (60) dans une surface de roulement, par exemple la surface routière, ayant une couche de roulement (7) recouvrant une couche de base (8), le dispositif (1) comprenant un cadre de service (50) dans lequel la trappe (60) est reçue de manière amovible, un cadre principal (20, 100) pour montage en dessous de la couche de base (8), et un moyen de support (70, 110) pour supporter le cadre de service (50) sur le cadre principal (20, 100) à une première position à laquelle, en utilisation, une surface supérieure (62) de la trappe d'accès (60) est sensiblement à niveau avec la surface supérieure de la couche de roulement (7), dans lequel l'enlèvement et/ou l'ajustement du moyen de support (70, 110) permet au cadre de service (50) d'être déplacé par rapport au cadre principal (20, 100) à une seconde position à laquelle, en utilisation, la surface supérieure (62) de la trappe d'accès (60) est sensiblement à niveau avec la surface inférieure de la couche de base (8), et dans lequel un ou plusieurs colliers d'extension (30, 40) est/sont placés sur une partie supérieure du cadre principal (20, 100), et dans lequel le cadre de service (50) est un cadre annulaire ou rectangulaire ouvert ayant au niveau de sa base un rebord (52) s'étendant vers l'extérieur.
6. Dispositif (1) selon l'une quelconque des revendications précédentes, dans lequel le moyen de support (70, 110) comprend un ou plusieurs colliers (71, 111a à d) ou un ou plusieurs éléments d'espateurs ajustables en hauteur (80) ou une combinaison de ceux-ci.
7. Dispositif (1) selon la revendication 5, dans lequel le cadre principal (20, 100) est un cadre annulaire ou rectangulaire ouvert ayant au niveau de sa base un rebord (22, 102) s'étendant vers l'intérieur.
8. Dispositif (1) selon l'une quelconque des revendications 1 à 4 et 7, dans lequel le moyen de support (70, 110) comprend un ou plusieurs colliers (71, 111a à d) disposés entre une surface supérieure (27) du rebord (22) du cadre principal (20, 100) et une surface inférieure (58) du rebord (52) du cadre de service (50).
9. Dispositif (1) selon l'une quelconque des revendications précédentes, dans lequel le cadre principal (20, 100) entoure le cadre de service (50) à la seconde position.

10. Dispositif (1) selon la revendication 6 ou 8, dans lequel un collier ou plusieurs colliers (71, 111a à d) comprend ou comprennent des segments séparables.
11. Dispositif (1) selon l'une quelconque des revendications 6 à 10, dans lequel le moyen de support (70) comprend, en outre, un élément espaceur ajustable en hauteur (80).
12. Dispositif (1) selon la revendication 11, dans lequel l'élément espaceur ajustable en hauteur (80) comprend une disposition de collier (81) et de coin (86), un collier ayant une ou plusieurs vis ajustables passant à travers celui-ci ou un ou plusieurs vérins hydrauliques ou pistons hydrauliques ou une combinaison de ceux-ci.
13. Dispositif (1) selon l'une quelconque des revendications précédentes, dans lequel du mortier, du ciment ou un matériau de garnissage est disposé entre une surface inférieure du cadre principal (20, 100) et le sol au-dessous de celui-ci.
14. Dispositif (1) selon l'une quelconque des revendications précédentes, dans lequel du mortier, du ciment ou un matériau de garnissage est disposé entre le moyen de support (70, 110) et le cadre principal (20, 100).
15. Dispositif (1) selon l'une quelconque des revendications précédentes, dans lequel du mortier, du ciment ou un matériau de garnissage est disposé entre le cadre de service (50) et le moyen de support (70, 110).
16. Dispositif (1) selon l'une quelconque des revendications précédentes comprenant, en outre, un ou plusieurs éléments espaceurs positionnés sur une partie supérieure du cadre de service (50).
17. Dispositif (1) selon l'une quelconque des revendications précédentes, dans lequel la distance verticale entre la surface supérieure (62) de la trappe d'accès (60) à la première position et sa surface supérieure (62) à la seconde position est dans une plage allant de 6 cm à 14 cm, de préférence allant de 8 cm à 12 cm et encore davantage de préférence d'approximativement 10 cm.
18. Dispositif (1) selon l'une quelconque des revendications 5 à 17, dans lequel le cadre principal (100) est constitué d'un ou plusieurs cadres empilables (100) ayant chacun une partie de paroi (101) s'étendant vers le haut et une partie de rebord (102) s'étendant vers l'intérieur au niveau de sa base et un évidement (104) formé autour d'un bord inférieur externe, lequel évidement peut coopérer avec la

partie supérieure de la partie de paroi (101) d'un autre cadre empilable (100).

19. Procédé de renouvellement de surface routière d'une surface de roulement ayant une couche de roulement (7) recouvrant une couche de base (8), dans lequel un dispositif (1), selon l'une quelconque des revendications précédentes, est placé dans la surface de roulement, le procédé comprenant les étapes consistant à :

- (a) enlever et/ou ajuster le moyen de support (70, 110) de manière telle que le cadre de service (50) est dans la seconde position ;
- (b) aplanir par enlèvement les couches de roulement (7) et de base (8) à la profondeur désirée ;
- (c) réinsérer et/ou ajuster le moyen de support (70, 110) de sorte que la surface supérieure (62) de la trappe d'accès (60) sera sensiblement à niveau avec la surface supérieure de la couche de base qui doit être déposée ;
- (d) déposer la couche de base (8) ;
- (e) ajuster le moyen de support (70, 110) de sorte que le cadre de service (50) sera sensiblement à la première position lorsque la couche de roulement est déposée ; et
- (f) déposer la couche de roulement (7).

20. Procédé de dépôt d'une nouvelle surface de roulement sur une surface de roulement ayant une couche de roulement (7) recouvrant une couche de base (8) dans lequel un dispositif (1), selon l'une quelconque des revendications 1 à 18, est placé dans la surface de roulement, le procédé comprenant les étapes consistant à :

- (a) ajuster le moyen de support (70, 110) pour surélever le cadre de service (50) à un niveau auquel la surface supérieure (62) de la trappe d'accès (60) sera sensiblement à niveau avec la surface supérieure de la nouvelle couche de roulement à déposer ; et
- (b) déposer la couche de roulement (7).

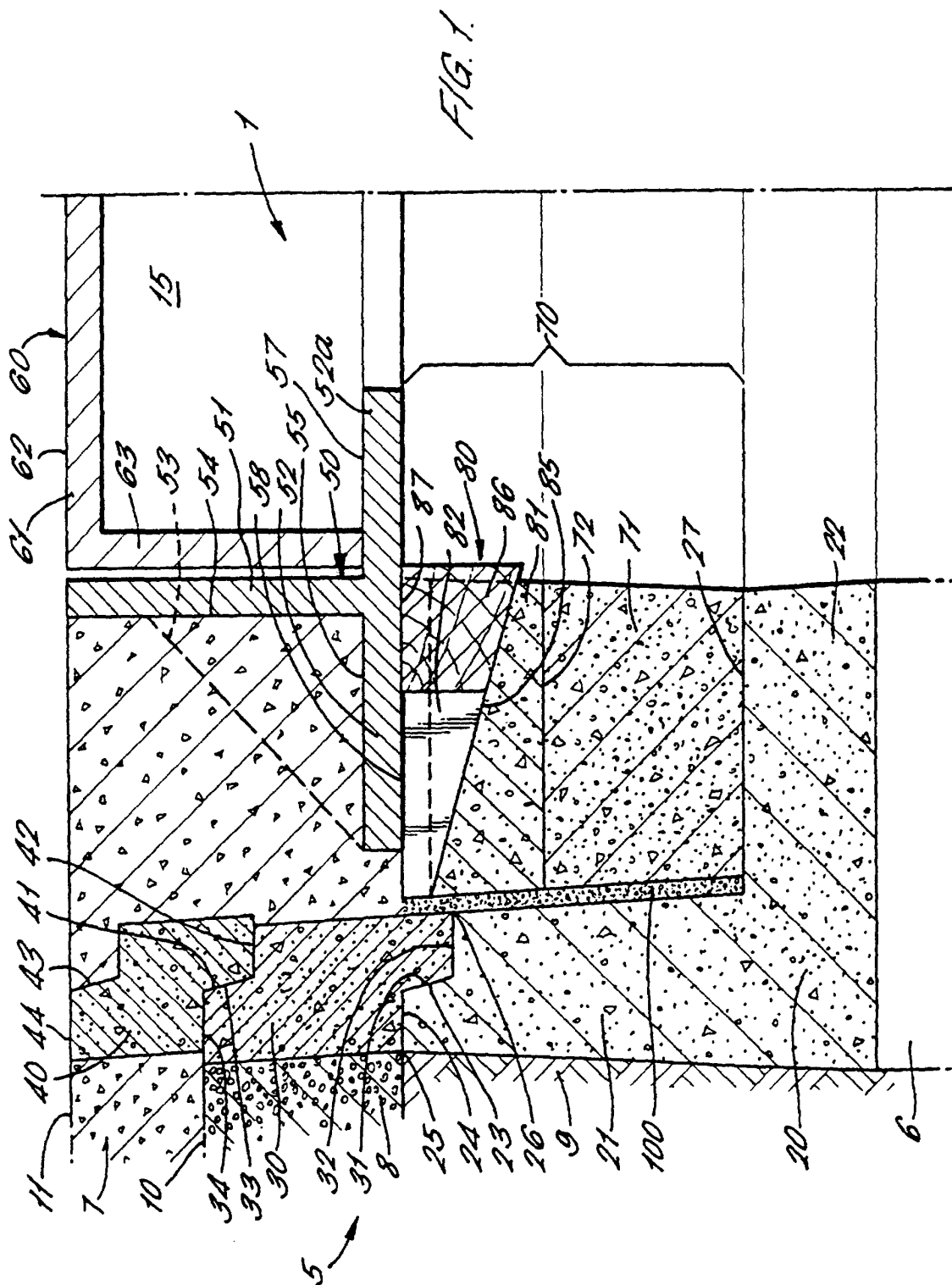


FIG. 2.

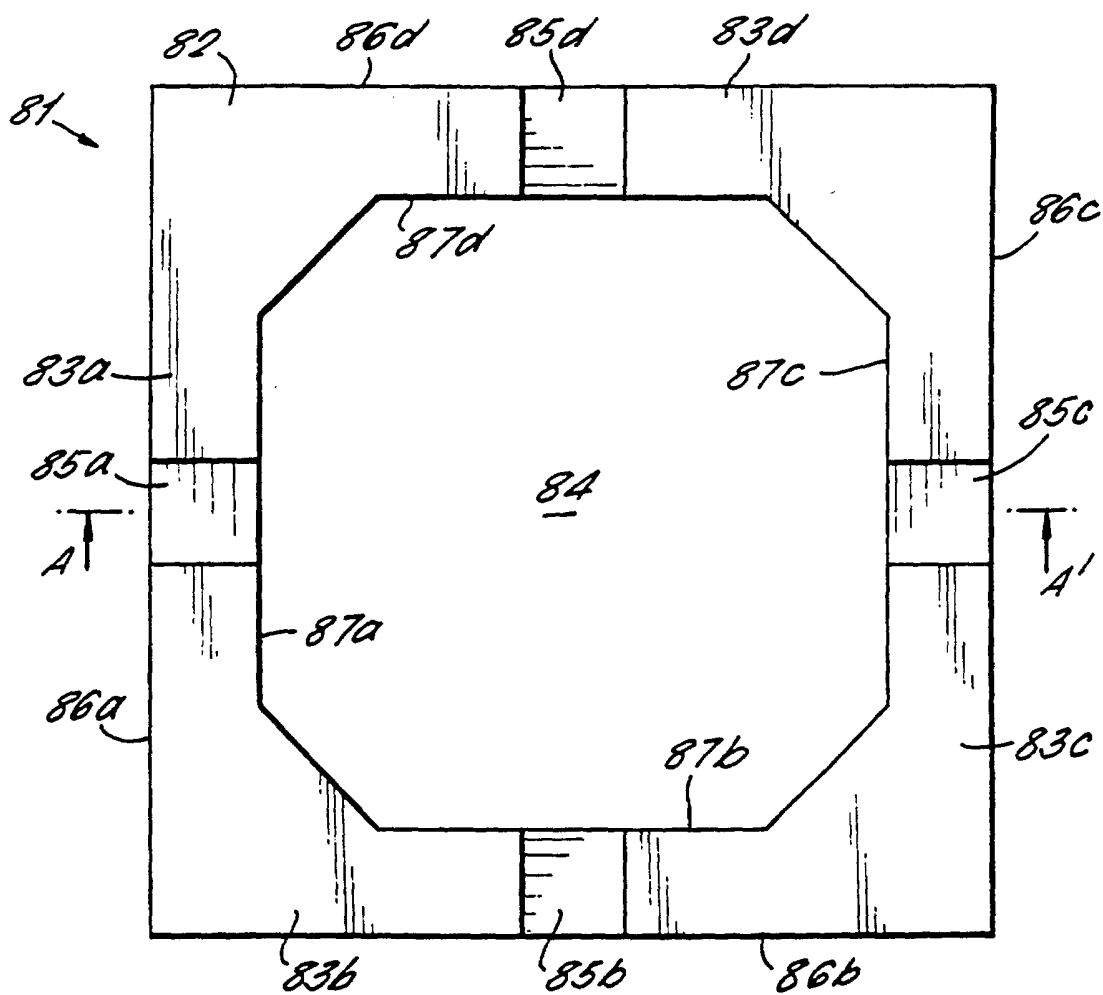
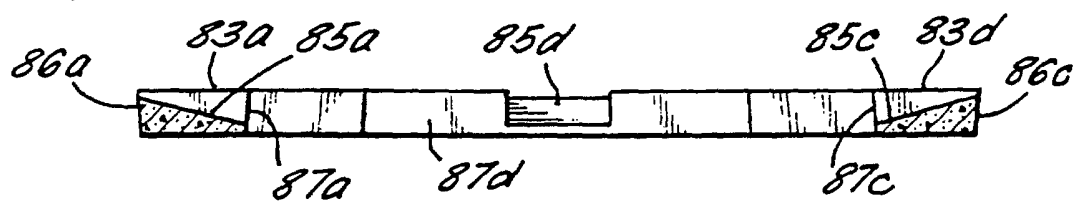


FIG. 3.



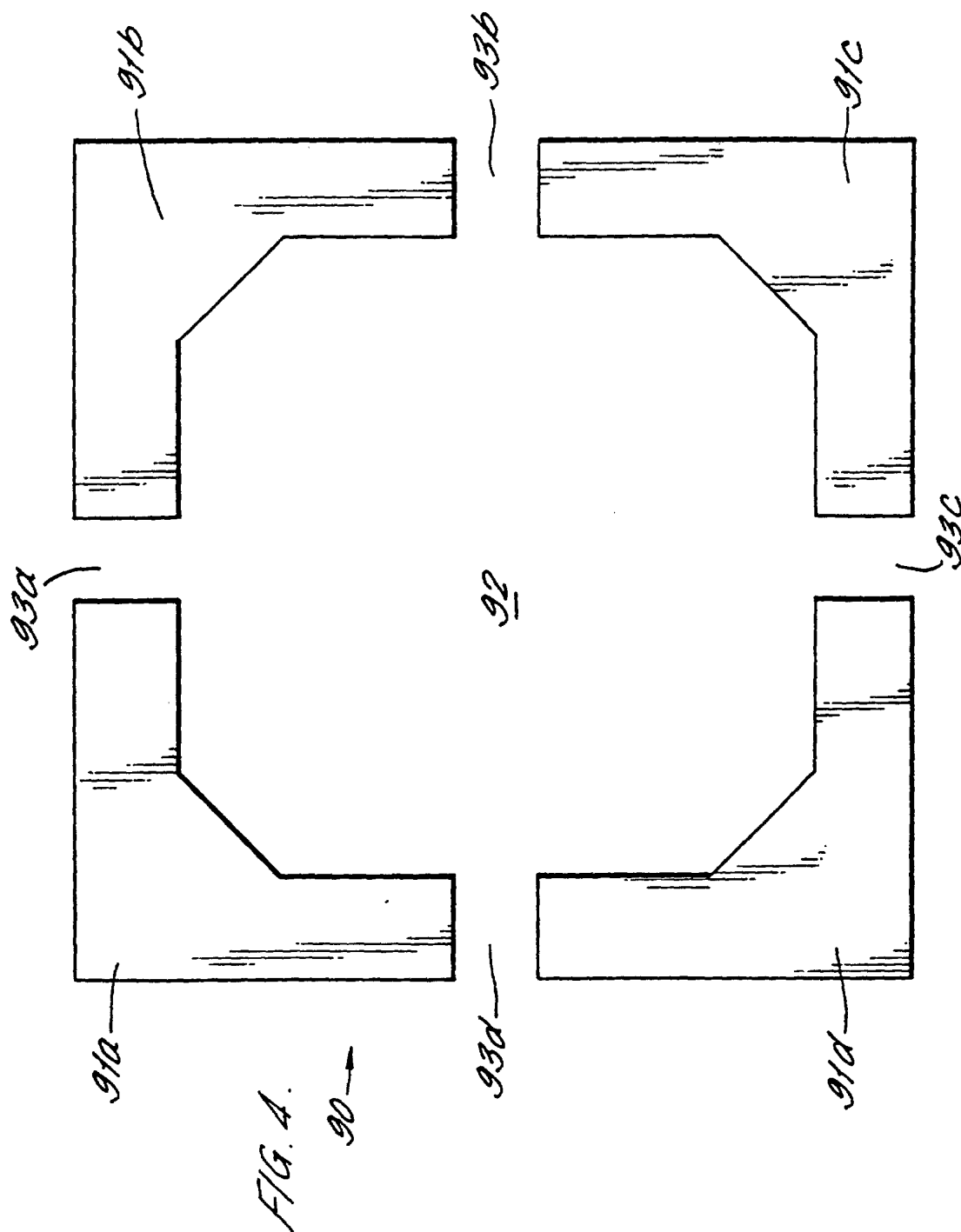


FIG. 5.

