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US-A-3 544 072(73) Proprietor: **Kabushiki Kaisha Naka Gijutsu Kenkyusho**
1020-178 Hassamu, Nishi-ku
Sapporo-shi, Hokkaido (JP)(72) Inventor: **NAKA, Hiromitsu Tokyo Kenkyusho of K.K.**
Naka Gijutsu Kenkyusho, 39 Oaza Shinmachi
Yashio-shi Saitama-ken 340 (JP)
Inventor: **MIYASHIRO, Takeshi Tokyo Kenkyusho of K.K.**
Naka Gijutsu Kenkyusho, 39 Oaza Shinmachi
Yashio-shi Saitama-ken 340 (JP)
Inventor: **SUGIMOTO, Yoshihide Tokyo Kenkyusho of K.K.**
Naka Gijutsu Kenkyusho, 39 Oaza Shinmachi
Yashio-shi Saitama-ken 340 (JP)(74) Representative: **Brooke-Smith, Fred**
STEVENS, HEWLETT & PERKINS 5 Quality Court
Chancery Lane
London WC2A 1HZ (GB)

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Description

This invention relates to a bracket and handrail combination for securing to a support structure at an installation area such as a staircase, floor or the like, for example. More particularly but not exclusively, this invention relates to a bracket and handrail combination in which the handrail is formed of resilient material such as soft synthetic resin, semi-hard synthetic resin or synthetic rubber and having a metal core or cores embedded therein, and in which the brackets enable the handrail to be easily attached to a support structure with a required slope and will not stand in the way when the user slides his hand or hands along the top rail.

When the handrail top rail comprises a body formed of resilient material such as soft synthetic resin, semi-hard synthetic resin or synthetic rubber and a metal core or cores embedded in the body, even if the top rail is secured by the use of a screw or screws to the bracket secured to a wall, when a load is applied to a top rail, the top rail tends to deform at its secured point or points and comes loose because the body of the top rail and its coating are formed of resilient material. In addition, especially, when the top rail body is formed of resilient material, an impact applied to the top rail span between a pair of adjacent brackets causes the handrail top rail to oscillate and as a result, after a prolonged service or use, a problem arises in connection with means which firmly secures the handrail top rail to a wall against the resilience of the surface of the top rail.

Therefore, one object of the present invention is to provide a bracket in combination with a handrail at an installation area such as a staircase or floor which handrail comprises a body formed of resilient material such as soft synthetic resin, semi-hard synthetic resin or synthetic rubber and a metal core or cores embedded in the body and extends from one end to the other end of the installation area with freedom of bending and without joints.

FR—A—2286930 discloses handrail constructions in which either the handrail is formed with lengthwise extending grooves which are engaged by complementary projections on the handrail supports or the handrail is formed with lengthwise extending projections which are engaged by complementary projections on the handrail supports so as to locate the handrail.

Another object of the present invention is to provide a bracket and handrail combination the handrail of which is capable of being obliquely disposed, said combination resisting loosening and rattling even after prolonged service or use.

U.S.—A—3544072 describes the combination of a bracket and a handrail, in which the bracket comprises a mounting block by which the bracket can be secured to a supporting structure, a support arm projecting outwardly from the mounting block and being integrally formed with the mounting block, and a support member provided with a through bore for a screw fastener

and secured to the outer end of the support arm by the screw fastener, said support member projecting generally at right angles to the support arm and providing a mounting portion at its free end for locating the handrail.

According to the present invention, such a combination is characterised in that the handrail comprises a top rail body formed of resilient material and a bendable metal core embedded in the top rail body, in that the mating faces of the support arm and support member at the outer end of the support arm are formed one with a counterbore and the other with an annular projection which fits in the counterbore, the screw fastener extending coaxially through the annular projection and counterbore, in that a pair of spaced arms project in a vertically upward direction and form between them a receiving groove for the handrail, and in that the distance between the spaced arms is smaller than the width of the handrail so that when the support member is fitted onto the handrail, the top rail body is caused to deform by virtue of its resiliency whereby the handrail is tightly fitted in the receiving groove.

The handrail may have its body formed for example from soft synthetic resin, semi-hard synthetic resin or synthetic rubber with the bendable metal core or cores embedded therein and can be installed at an installation area and can extend in a winding path in conformity with the contour of the installation area from one end to the other end of the installation areas without joints in a relatively simple manner and relatively inexpensively. The bracket can simplify the top rail installation operation and shorten the installation time. Furthermore, the bracket can be coloured in various colours to provide an enhanced decorative effect.

Some embodiments of the invention will now be described by way of example with reference to the accompanying drawings in which:

Figure 1 is a front elevational view of an embodiment of a bracket and handrail combination embodying the present invention;

Figure 2 is a sectional side view of the bracket and handrail combination shown in Figure 1;

Figures 3 and 4 are sectional side views of a further embodiment according to the invention;

Figure 5 is a perspective view of another form of bracket and handrail combination according to the invention.

Figure 6 is a sectional side view of the bracket and handrail combination shown in Figure 5;

Figure 7 is an exploded sectional side view of the bracket and handrail combination shown in Figure 5;

Figure 8 is a sectional side view of another form of bracket and handrail combination according to the invention;

Figure 9 is a sectional side view of still another embodiment of bracket and handrail combination according to the invention; and

Figure 10 is a back view of the bracket shown in Figure 7.

Referring to the accompanying drawings,

Figures 1 and 2 show a first embodiment of a bracket B and handrail combination according to the invention. The bracket B comprises a mounting block 1 adapted to be secured to a support portion at the installation area or a wall W by means of screws 7 or like fastener, a support arm 2 extending outwardly from the block 1 substantially at right angles thereto and a rail support member 3 secured to the leading end of the arm 2. The top rail support member 3 provides a top rail receiving groove 8 of substantially U-shaped cross-section defined by a pair of opposite and spaced arms 3a, 3b shaped in conformity with the contour of the surface of a lower portion of a handrail H. The rail H which is adapted to be secured to the installation area or wall W adjacent a staircase, floor or the like by the bracket B comprises an elliptical cross-section body 5 formed of resilient material such as soft synthetic resin, semi-hard synthetic resin or synthetic rubber. The top rail body 5 has two bendable metal cores 6 incorporated therein and the cores are capable of maintaining the body 5 in its bent condition against the resiliency of the top rail body 5 after the top rail has been bent.

The upper edges of the opposite arms 3a, 3b of support members 3 extend to substantially the centre of the height of the rail H on the outer and inner sides of the rail, respectively and the distance between the leading or upper end portions of the arms 3a, 3b is slightly smaller than the width of the rail H (the distance between the outer and inner sides of the rail) so that when the support member 3 is fitted on the rail H, the body 5 of the rail is caused to deform by virtue of its resiliency whereby the rail H is tightly fitted in the groove 8 of the top rail support member 3 against inadvertent rotation (rolling) within the groove 8 which otherwise occurs due to the deformation of the resilient rail when a load is applied to the rail. And the screws 7 driven through the support member 3 into the rail body 5 are disposed substantially normal with respect to the arms 3a, 3b of the support member 3 (that is, substantially horizontally) so that the screws 7 resist positively a load which will be applied to the rail H in the direction in which the rail comes out of the support member groove 8 (that is, in the vertically upward direction). However, the rail and rail support member may alternatively be firmly connected together by means such as adhesive and the like.

The rail support member 3 is formed separately from the support arm 2 and has a boss 10, the member 3 being secured to the support arm 2 by connecting means such as a bolt 11 which extends through the boss 10. The support arm 2 includes a threaded through bore 12 for the bolt 11, and a recess in the form of a coaxial counterbore 13 having the diameter larger than that of the bore 12 is formed at the leading or outer end of the threaded bore 12. The rail support member 3 includes a through bore 14 in the boss 10 for receiving the shank of the bolt 11. The boss 10 is formed at its inner face with a sleeve portion 15

adapted to be received in the counterbore 13 and at its outer face with a counterbore 16 for receiving the head of the bolt 11.

Thus, in the installation of the top rail and bracket B on the wall, as shown in Figure 2, a plurality of brackets B are first secured to the walls W at spaced points along the walls by the screws or the like, the rail H is bent in conformity with the winding contour of the walls W and is fitted in the brackets B and secured to the members 3 by the fastening means such as the screws 7. After the mounting blocks 1 have been secured to the walls W and the top rail H has been secured to the rail support members 3 in the manner mentioned above, the sleeve portions 15 are fitted into the corresponding counterbores 13 to align the bosses 10 on the members 3 with the leading ends of the support arms 2 and the bolts 11 are screwed into the threaded bores 12 to secure the support members 3 to the support arms 2 resulting in the installation of the top rail H on the walls W.

Since the support member 3 is formed separately from the support arm 2, the support arm 2 and boss 10 are connected to each other by the interfitting counterbore 13 and sleeve portion 15 for angular adjustment and the support arm 2 and support member 3 are firmly connected together by the connector bolt 11, when the top rail H is to be installed on a sloped installation area such as a staircase handrail, the brackets B can be freely inclined in conformity with the inclination of the top rail H.

The leading end face 18 of the support arm 2 and the inner end face of the boss 10 may be formed with radial meshing faces. In assembling the support arm 2 and support member 3 at a predetermined angle, the leading end 18 of the support arm 2 and the inner end face of the boss 10 are abutted against each other so as to cause the meshing faces to engage each other and a connector bolt 11 is passed through the boss 10 into the support arm 2 to thereby provide a firm connection between the support arm 2 and support member 3. The meshing faces are formed as saw-toothed cross-sectional faces extending radially.

The inner surface of the counterbore 13 in the support arm 2 and the outer surface of the sleeve portion 15 on the boss 10 may be provided with meshing faces so that when the support member 3 is connected to the support arm 2 at a predetermined angle thereto, as in the case of the bracket described above, a firm connection is provided between the support arm 2 and support member 3. The meshing faces are also formed as saw-toothed cross-section faces extending in the axial direction of the arm 2 and member 3. Thus even when the support member 3 is subjected to a rotational force, the bracket resists positively.

Figures 3 and 4 shows a further embodiment of bracket and handrail combination according to the invention in which sleeve portion 15 is formed at the leading end face of the support arm 2 and the counterbore 13 is formed at the outer end face

of the boss 10 and the counterbores 13 and 16 at the opposite end faces of the boss 10 have the same shape and diameter whereby the arrangement of the top rail block 9 with respect to the support arm 2 to which the block 9 is secured by the connector bolt 11 can be reversed. Taking decorative effects on the walls W adjacent a staircase, hospital floor and the like into consideration, the mounting portion 4 may be secured to the side of the top rail facing the wall W (or the inner side of the top rail) or the other or outer side of the top rail as the case may be. Alternatively, alternate brackets B may be reversed in their arrangement with respect to the top rail H so that the mounting portions 4 are alternately secured to the outer and inner sides of the top rail H.

In the embodiments as mentioned hereinabove, the counterbore 13 and sleeve portion 15 formed at the leading end of the support arm 2 and on the top rail block boss 10, respectively, may be formed with concavo-convex faces as desired. In such a case, even when the top rail H is subjected to oscillation to thereby impart rotary oscillation to the components of the top rail support block 9, the connector bolt 11 will not unscrew out of the threaded bore.

Figures 5 to 7 inclusive show a third embodiment of bracket and handrail combination of the invention in which the mounting block 1 and support arm 2 is so modified that the connector bolt 11 of the embodiment shown in Figures 1 and 2 is replaced by connector bolt and nut 11, 32. The threaded through bore 12 extending from the support arm 2 through the mounting block 1 in the bracket of Figures 3 and 4 is replaced by a through bore 26. A detent counterbore 31 is formed on the inner side of the mounting block 1 in communication with the through hole 26 and a nut 32 is screwed on the connector bolt 11 in the counterbore 31.

The detent counterbore 31 has the depth *d* substantially corresponding to the height of the nut 32.

The mounting block 1 is formed on the inner side thereof with a recess 33 so that a clearance S is formed between the wall W and the inner side of the mounting block 1. The dimension of the clearance S is, of course, smaller than that of the counterbore 32 whereby when the nut 32 is screwed onto the threaded portion of the connector bolt 11 extending through the through bore 14 in the boss 10 of the top rail support block 9 and through the through bore 26 extending from the support arm 2 into the mounting block 1, even when the connector bolt 11 pushes the nut 32, the nut 32 abuts against the wall W and is prevented from coming out of the detent counterbore 31.

Figure 8 shows another form of bracket and handrail combination according to the invention in which the connector bolt 11 is passed from the mounting block 1 therethrough into and through the boss 10 and the nut 32 is screwed onto the protruding threaded end portion of the connector

bolt 11 thereby to secure the support member 3 to the support arm 2.

Figures 9 and 10 show a fifth embodiment of bracket and handrail combination according to the invention. In this embodiment the detent counterbore 31 in the bracket shown in Figures 5 to 7 inclusive is replaced by a detent groove 34 formed in the mounting block 1 and support arm 2, the counterbore 16 formed in the boss 10 on the support member 3 is modified to a larger counterbore 35 and the connector bolt 11 is replaced by threaded bar 36 with a stopper 37 and a nut 32. The stopper 37 on the threaded bar 36 is connected to the threaded bar 36 by a pin in such a manner that when the threaded bar 36 is disposed horizontally the stopper 37 orients itself vertically by its own weight.

Thus, in the embodiment shown in Figures 9 and 10, the mounting block 1 is first secured to the wall W by screw means and the sleeve portion 15 is fitted into the bore 13 in the support arm 2 integral with the mounting block 1 until the boss 10 abuts against the leading end face of the support arm 2 to thereby position the top rail support block 9 on the support arm 2.

Thereafter, the threaded bar 36 is passed through the aligned through bores 26, 14 in the support arm and boss 2, 10 until the stopper 37 is positioned in the detent groove 34 and the nut 32 is tightened on the threaded bar 36.

After the top rail support block 9 has been secured to the support arm 2 by means of the threaded bar and nut assembly 36, 32 in the manner mentioned above, a cap 38 is snapped into the counterbore 35 to cover the exposed threaded end portion of the bar 36 and the nut 32.

At supporting areas associated with staircases, floors and the like in buildings such as walls and particularly, limited areas such as walls associated with staircases and floors, it will be clear from the foregoing description on the various embodiments of the invention that the brackets B and handrail can be employed in conformity with the necessary winding and sloping characteristics and that the handrails and guard rails which are installed at the continuous support areas are formed of resilient material such as soft synthetic resin, semi-hard synthetic resin or synthetic rubber and which have metal cores embedded therein.

Claims

1. In combination a bracket and a handrail, the bracket comprising a mounting block (1) by which the bracket can be secured to a supporting structure, a support arm (2) projecting outwardly from the mounting block (1) and being integrally formed with the mounting block (1), and a support member (3) provided with a through bore (14) for a screw fastener (11) and secured to the outer end of the support arm (2) by the screw fastener, said support member (3) projecting generally at right angles to the support arm (2) and providing a mounting portion (4) at its free end for locating the handrail (H), characterised in

that said handrail comprises a top rail body (5) formed of resilient material and a bendable metal core (6) embedded in the top rail body, in that the mating faces of the support arm (2) and support member (3) at the outer end of the support arm are formed one with a counterbore (13) and the other with an annular projection (15) which fits in the counterbore (13), the screw fastener extending coaxially through the annular projection (15) and counter bore (13), in that a pair of spaced arms (3a, 3b) project in a vertically upward direction and form between them a receiving groove for the handrail, and in that the distance between the spaced arms (3a, 3b) is smaller than the width of the handrail so that when the support arm is fitted onto the handrail, the top rail body is caused to deform by virtue of its resiliency whereby the handrail (H) is tightly fitted in the receiving groove.

2. The combination as claimed in claim 1, characterised in that one of the spaced arms (3a, 3b) is longer than the other whereby the handrail can be screwed to the longer arm.

3. The combination as claimed in claim 1 or claim 2 characterised in that a detent counterbore (31) is formed on the inner side of the mounting block in communication with the through bore (14) and is enlarged to accommodate and locate against rotation a nut (32), which nut (32) receives the screw fastener.

Patentansprüche

1. Kombination einer Stütze und eines Handlaufs, wobei die Stütze einen Montageblock (1), durch den die Stütze an einer tragenden Konstruktion befestigt werden kann, einen Tragarm (2), der sich von dem Montageblock (1) nach außen erstreckt und mit dem Montageblock (1) einstückig geformt ist, und ein Halteglied (3) umfaßt, das mit einer durchgehenden Bohrung (14) für eine Befestigungsschraube (11) versehen ist und mit der Befestigungsschraube am äußeren Ende des Tragarms (2) befestigt ist, wobei das Halteglied (3) im wesentlichen im rechten Winkel zum Tragarm (2) vorsteht und an seinem freien Ende einen Montageabschnitt (4) für die Anordnung des Handlaufs (H) vorsieht, dadurch gekennzeichnet, daß der Handlauf einen äußeren Handlaufkörper (5) aus elastischem Material und einen in dem äußeren Handlaufkörper eingebetteten biegsamen Metallkern (6) umfaßt, daß von den einander zugeordneten Flächen des Tragarms (2) und des Halteglieds (3) am äußeren Ende des Tragarms die eine mit einer Gegenbohrung (13) und die andere mit einem kreisringförmigen Vorsprung (15) ausgebildet ist, wobei sich die Befestigungsschraube koaxial durch den kreisringförmigen Vorsprung (15) und die Gegenbohrung (13) erstreckt, daß ein Paar auseinanderliegender Arme (3a, 3b) sich vertikal nach oben erstreckt und zwischen sich eine Aufnahmenut für den Handlauf bildet, und daß die Entfernung zwischen den auseinanderliegenden Armen (3a,

3b) kleiner als die Breite des Handlaufs ist, sodaß bei der Anordnung des Tragarms am Handlauf der äußere Handlaufkörper infolge dessen Elastizität deformiert wird, wobei der Handlauf (H) fest in der Aufnahmenut aufgenommen wird.

2. Kombination gemäß Anspruch 1, dadurch gekennzeichnet, daß einer der auseinanderliegenden Arme (3a, 3b) länger ist als der andere, wobei der Handlauf an den längeren Arm angeschraubt werden kann.

3. Kombination gemäß Anspruch 1 oder Anspruch 2, dadurch gekennzeichnet, daß an der inneren Seite des Montageblocks eine Rast-Gegenbohrung (31) ausgebildet ist, die in die durchgehende Bohrung (14) übergeht und vergrößert ist, um eine Mutter (32) aufzunehmen und gegen Verdrehung zu sichern, wobei die Mutter (32) die Befestigungsschraube aufnimmt.

Revendications

1. Ensemble constitué d'une potence et d'une main courante, la potence comprenant un bloc de montage (1) par lequel la potence peut être fixée sur une structure portante, un bras porteur (2) faisant saillie extérieurement du bloc de montage (1) et étant formé intégralement avec le bloc de montage (1), ainsi qu'un élément porteur (3) pourvu d'un trou de traversée (14) pour une vis de fixation (11), et fixé sur l'extrémité extérieure du bras porteur (2) par la vis, ledit élément porteur (3) faisant saillie dans l'ensemble à angle droit par rapport au bras porteur (2) et comportant à son extrémité libre une partie de montage (4) servant au positionnement de la main courante (H), caractérisé en ce que ladite main courante comprend une barre supérieure (5) formée d'un matériau élastique et une âme métallique pliable (6) incorporée à la barre supérieure, en ce que les faces correspondante du bras porteur (2) et de l'élément porteur (3) à l'extrémité extérieure du bras porteur sont pourvues, l'une d'un contre-alésage (13) et l'autre, d'une saillie annulaire (15) qui s'emboîte dans le contre-alésage (13), la vis de fixation s'étendant coaxialement au travers de la saillie annulaire (15) et du contre-alésage (13), en ce qu'une paire de bras espacés (3a, 3b) font saillie dans une direction orientée verticalement vers le haut et forment entre eux une rainure de réception de la main courante, et en ce que la distance entre les bras espacés (3a, 3b) est inférieure à la largeur de la main courante de sorte que, quand le bras porteur est monté sur la main courante, le corps de la main courante soit obligé de se déformer du fait de son élasticité, de telle sorte que la main courante (H) soit maintenue étroitement dans la rainure réceptrice.

2. L'ensemble tel que revendiqué dans la revendication 1, caractérisé en ce qu'un des bras espacés (3a, 3b) est plus long que l'autre de manière que la main courante puisse être vissée sur le bras plus long.

3. L'ensemble tel que revendiqué dans la revendication 1 ou la revendication 2, caractérisé en ce qu'un contre-alésage d'encliquetage (31) est

formé sur le côté intérieur du bloc de montage en communication avec le trou de traversée (14) et est élargi pour recevoir et positionner en

l'empêchant de tourner un écrou (32), ledit écrou (32) recevant la vis de fixation.

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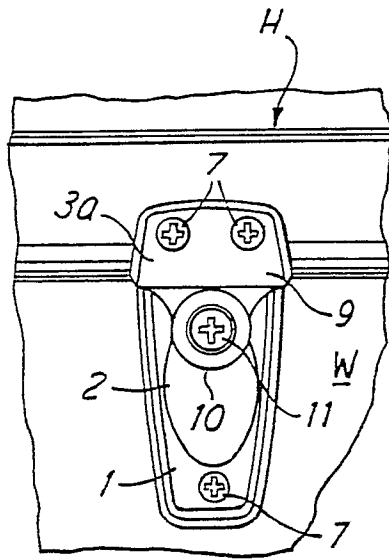


FIG. 1

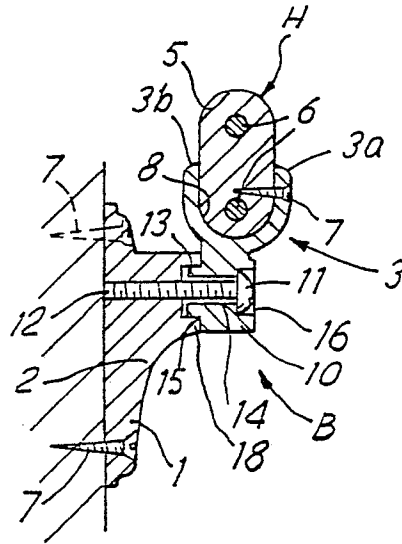


FIG. 2

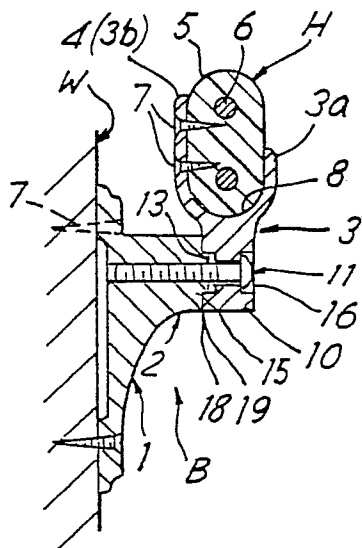


FIG. 3

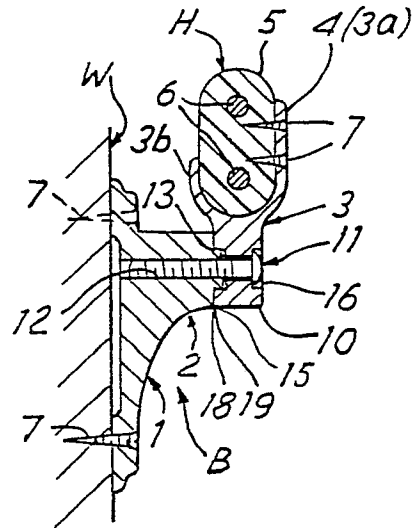


FIG. 4

