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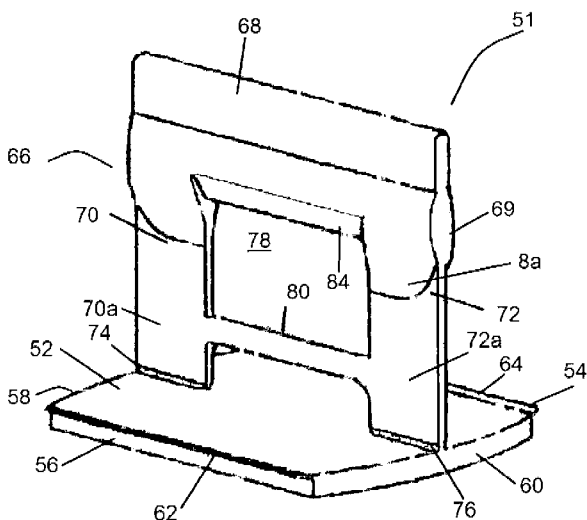


Fig. 5

(57) Abstract: A clip (51) for use in combination with a tile levelling member, the clip (51) comprising: a base (52) having an underside surface, an upper surface, two opposed linear side faces (54, 56), and two opposed end faces (58, 60) each linear side face having an upper side edge and a lower side edge and in use, one side face (58,60) is located beneath the underside surface of a first tile and the other side face (58, 60) is located beneath a second adjacent tile; an upstanding member (66) connected to the upper surface that in use projects upwardly between the edges of the first tile and the second adjacent tile and that is configured to mechanically cooperate with a tile levelling member, wherein one or each upper side edge includes an upwardly directed lip (62, 64) extending substantially along upper side edge.



TILE LEVELLING CLIP AND SYSTEM

FIELD

The present disclosure relates to clips and combinations including the clips for use in tile levelling and spacing systems.

BACKGROUND

The reference to prior art in this specification is not and should not be taken as an acknowledgment or any form of suggestion that the referenced prior art forms part of the common general knowledge in Australia or in any other country.

When laying tiles, it is well known to place plastic crosses between tiles so as to space the tiles evenly apart. However, this does not ensure that the tiles are level and flush with respect to each other. Tiles can be laid unevenly due to variations in the flatness of the substrate floor, variations in tile thickness, variations in the amount of adhesive used and variations in batches of adhesive. This difference in elevation between adjacent tiles is known as lippage. Lippage is a particular problem with larger tiles as a result of unevenness in the substrate surface. Larger tiles have less tolerance for such unevenness, when compared with smaller tiles.

In order to address the issue of laying a level tiled surface, various types of tile levelling systems have been proposed. These systems have a common general concept of providing a clip having a base that is placed under two adjacent tiles as the tiles are laid before the adhesive has set. The clip has a stem portion that is frangibly connected to the base about a break point and extends above the upper surface of the tiles. The stem has a width that is intended to allow the tiles to be evenly spaced from each other.

In one type of system, the clip has an opening. In use, a wedge is driven into the opening to force the adjacent tiles into horizontal alignment.

In an alternative arrangement, a clip also has a tab with teeth for engaging a tile leveller member. The tile leveller member operates as a pawl that engages the teeth of the tab. The tile leveller member is pushed down along the tab towards the tiles by a dedicated hand tool so as to apply a tile levelling pressure on the tiles.

In one such system, the tab is frangibly connected to the base.

In these systems, after the tile adhesive has set, the upper part of the clip and engaged wedge or tile levelling member are separated from the base by force such as kicking or hitting with a mallet. The base remains behind beneath the tiles.

Despite being an apparently simple system, there are a large number variations of tile-levelling systems, each system designed to address a perceived problem with other systems.

Many systems are concerned with the perceived problem of the fact that the base that is beneath the tile, limits contact of adhesive with the undersurface of the tile and to the substrate. In order to address this, many systems use a base having holes through which adhesive may pass. Alternatively, or in addition to, other systems have an upwardly curved base

Still further arrangements have a curved base that has notches or cut outs along the sides so as to provide additional surface area for contact between the tile and the adhesive.

Another perceived difficulty with tile levelling systems is an inability to accommodate tiles of different thicknesses. This has been addressed by providing bases having convex curvatures that are flexible, springlike or otherwise compressible lips or wings so as to allow for levelling of different tile thicknesses. The thicker heavier tile on one side compresses the base more than the lighter tile pressing down on the other side.

In practice a ceramic, porcelain or other similar materials are manufactured tile have a constant thickness. Differing thickness is generally only associated when laying slate, natural stone tiles or the like. Thus in the significant majority of applications, the use of clips with curved bases is unnecessary. Systems that use clips with substantially flat bases are also known. The side edges of the flat bases that are inserted under the tile edge generally terminate in a downwardly inclined ramp to assist in sliding the base below the tile edge.

The present inventor has observed that in practice, there are a number of disadvantages with these systems. When tiling, adhesive is spread on the substrate floor and a tile is set onto the adhesive. As the base of a respective clip is inserted beneath the bottom surface of the tile this pushes adhesive up along the sidewall of the tile. When the next tile is laid there is adhesive between the two tiles. This has a number of disadvantages. In some cases, the adhesive is sufficient to cause an inconsistency in the spacing between the adjacent tiles. This can cause an uneven grout line. Further, it is desirable to grout

adhesive free joints. If there is adhesive in the joint, this can reduce the amount of grout in the joints and eventually cause cracking of the grout.

Still further, the adhesive can be pushed up above the top of the tile. This requires the dried adhesive to be manually removed after the upper portion of the stem or tab has been removed, prior to grouting. Alternatively, excess adhesive along the tile edge may be manually removed with a trowel prior to placing the clips along the tile edge. It will be appreciated that removal of adhesive on the edges and/top of tiles adds additional time to the tile laying process. This adds to cost.

A still further design feature of known tile levelling systems is the location of the break point on the stem. In one type of system, the base is convex and the break point is located such that it is near the base and is just beneath the lower surface of a tile. As adhesive is pushed into the grout space, the adhesive can set about the break point, thereby making it more difficult to break off the stem.

One system that has been proposed to address this problem is to space the breakpoint from the base such that the break point is located in the space between the upper and lower surface of the tiles with the intention that the breakpoint will be above the surface of the adhesive. Such a solution however, creates a further difficulty in that the stub of the stem below the breakaway point remains in the space between the tiles. The residual plastic between the tiles can interfere with thermal expansion of the tiles and may eventually lead to cracking of the tiles.

Despite the range of tile levelling systems available to tilers, the present inventor is not aware of any system that has been designed with the aim of minimising or reducing adhesive in the joints between the tiles.

In some cases, the alleged solutions to perceived problems may exacerbate the problem of excess adhesive in the tile joint.

For example, providing notches or other openings in the base to allow adhesive to seep from the bottom to the top of the base, in some cases, may exacerbate the problem of excess adhesive in the tile joint.

Further, in the system that has a flat base with ramped side edge, the ramp simply serves to guide adhesive onto the base and into the tile joint.

It would be appreciated that being able to provide a tile levelling system and clip that may provide a working advantage to a tiler laying tiles would be desirable.

DEFINITION

In the present specification and claims the term “comprising “ shall be understood to have a broad meaning similar to the term “including” and will be understood to imply the inclusion of a stated integer or step or group of integers or steps but not the exclusion of any other integer or step or group of integers or steps. This definition also applies to variations on the term “comprising” such as “comprise” and “comprises”.

SUMMARY

According to a first broad aspect of the disclosure, there is provided a clip for use in combination with a tile levelling member, the clip comprising:

a base having an underside surface, an upper surface, two opposed linear side faces each linear side face having an upper side edge and a lower side edge and in use, one side face is located beneath the underside surface of a first tile and the other side face is located beneath a second adjacent tile;

an upstanding member connected to the upper surface that in use projects upwardly between the edges of the first tile and the second adjacent tile and that is configured to mechanically cooperate with a tile levelling member, wherein

one or each upper side edge includes an upwardly directed lip extending substantially along upper side edge.

The term tile should be understood to include but not limited to panels, sheets, boards, ceramic, paving stones, bricks, glass tiles, stone or porcelain slabs or the like that may be laid on a substrate.

The device has a base with an upstanding member that in use projects upwardly between adjacent tiles. The upstanding member suitably has a width for providing a desired spacing between the adjacent tiles.

The base suitably does not have any holes, openings or the like, that in use may allow adhesive to seep through from the underside surface to the upper surface of the base.

The upstanding member is configured to cooperate with a tile levelling member. The tile levelling member may be any suitable member that can cooperate with the upstanding member in a manner that the levelling member may be moved to a tile levelling position with respect to the adjacent tiles that the upstanding member projects between.

In one aspect the upstanding member is a ratchet stem and the tile levelling member has a pawl, so that the tile levelling member can move downwards along the stem towards the tile so as to apply a tile levelling pressure thereon.

In an alternative aspect, the upstanding member may be a tab that has a substantially rectangular opening therein for receiving a wedge. When the wedge is inserted into the opening with force, a tile levelling force is applied.

The opening may be defined by the upper surface of the base, a head and two arms that are frangibly connected to the upper surface of the base.

The upstanding member is suitably frangibly connected to the base. Suitably, the point of frangible connection or breakpoint is located near the base at a point that in use is below the lower surface of the tiles. Alternatively, the base may be configured with a notch or the like to allow the breakpoint to be located below the upper surface of the base.

The base has two linear side faces with upper side edges that have an upstanding lip extending substantially along the length of one or both thereof.

By linear is meant that the side faces extend in a substantially straight line along the sides of the base. In other words, the side faces are not provided with significant notches, or cut out portions. It will be appreciated that for practical purposes some minor variations in linearity may be tolerated.

In use, when a side edge of the base is being inserted into the adhesive under the edge of a tile, the upstanding lip serves to scrape or push adhesive back under the tile, rather than allow adhesive to be pushed out towards the edge of the tile.

By substantially extending along the full length of the upper side edge, it is meant that it may not be necessary for the lip to extend completely along the full length of the side edge to serve the purpose of pushing excess adhesive out of the way as the base is being inserted under the tiles so as to reduce or minimize the likelihood of adhesive rather than squeezing the adhesive back towards the edge of the tile and into the tile joint area.

The lip is suitably dimensioned such that when the base is being inserted under a tile, there is sufficient clearance between the underneath surface of the tile and the lip such that the lip is not unduly compressed or forced downwardly. Suitably the lip is angled and dimensioned such that it operates as a blade or scraper to push adhesive away from the tile edge.

The angle of the lip relative to the depth of the side face is suitably between about 27° to about 63° to the horizontal, suitably between about 35° to about 55°, suitably about 45°.

The relative dimensions of the length of the lip relative to the depth of the side face may be from about 2:1 to about 1:2.

The base is suitably generally rectangular with the upstanding member extending along the longitudinal center line thereof. The opposed side faces are suitably parallel to the longitudinal center line.

By generally rectangular, it is meant that the sides are not necessarily straight and some curvature may be tolerated. The end edges may be curved or bowed out.

A lip may only be located along one side edge of the base. This requires a tiler to ensure that it is that side of the base that is inserted beneath the laid tile.

Therefore, more suitably, but not necessarily, each side edge of the base has a lip.

In the aspect of the disclosure in which the clip includes an opening for receiving a wedge, the clip may further include a cross member across the opening so as to divide the opening into an upper section for receiving the wedge and a lower section and in use, the cross member lies below the upper surface of a tile.

As the cross member extends below the upper surface of a tile, it effectively provides a barrier for any excess adhesive that may be in the tile joint from being pushed upwards onto the surface of the tile.

Conventional tile levelling systems clips that use a clip and wedge only have a single opening. The present inventor has surprisingly and unexpectedly discovered that the provision of the cross member can assist in reducing or preventing excess adhesive along the tile edge and in the tile joint from being pushed upwards onto the tile surface.

Suitably, the width of the cross member is the same as the desired width of the tile joint, such that the cross member may effectively block any adhesive being squeezed past it and onto the tile surface.

Suitably, the cross member is located below the level of the top of the tile.

Even further surprisingly, the present inventor has discovered that the combination of the cross member and the lips on the base as discussed above can allow for the clips to be placed quickly and efficiently without causing excess adhesive onto the tile upper surface and/or force excess adhesive between the tiles so as to cause inconsistency in the spacing between tiles.

In another aspect of the disclosure, there is provided a clip for use in combination with a tile levelling wedge, the clip comprising:

a base having an underside surface and an upper surface; and

an upstanding member frangibly connected to the upper surface that in use projects upwardly between the edges of adjacent tiles and including an opening having an upper section that in use extends above the upper surface of a tile for receiving a wedge and a lower section that in use lies below the upper surface of a tile and a cross member separating the upper and lower sections.

The opening may be defined by the upper surface of the base, a head and two arms that are frangibly connected to the upper surface of the base.

Suitably the clips as disclosed herein for use with a wedge also have a thickened section in that part of the upstanding member that is associated with the upper edge of the opening. This thickened section serves to reinforce the upper edge of the opening against deformation when the wedge is driven into the opening. Deformation of the edge by the wedge can interfere with driving of the wedge and/or dissipate the driving force so that less force is applied to levelling the tiles.

After the wedge has been driven into the opening, the adhesive is allowed to cure. After curing, the clip and wedge are removed by applying a force to break the upstanding member at the frangible portion. Force is typically applied by kicking or with a mallet. Some tiles, such as ceramic tiles, are subject to cracking. When the upstanding members are being

removed, it is possible for the tile edges to be chipped, cracked or otherwise damaged as the upstanding members are removed.

In one aspect, the upper parts of the arms become thickened. Suitably, the transition to the thickened section is curved. This may reduce or minimise the tile edges being damaged when the devices are removed from the tiles.

Also disclosed is a tile levelling system comprising the secondly disclosed clip and a wedge member.

In some of the known tile levelling systems that use a wedge/clip combination, a dedicated tool is used to force the wedge into the opening. The base of the wedge is configured to cooperate with the tool.

Suitably, the disclosed clips are used with wedges that do not require the use of a dedicated tool to force the wedges through the opening in the clip. To assist with manual operation, the present inventor has provided an alternative wedge with features that significantly contribute to the working of the wedge.

Also disclosed herein is a wedge for use in a tile levelling system, the wedge has a upper surface that tapers down from a base end, the upper surface having teeth and the base end having a finger contacting section upstanding therefrom.

The upstanding section has a rear pushing surface that may provide additional surface area for a user's thumb to press the wedge home into the opening in the clip. This allows for additional force to be applied and/or makes it more comfortable for a tiler. It will be appreciated that installing a large number of wedges can be tiring. The presently disclosed wedges may allow a tiler to install a large number of wedges more comfortably and efficiently when compared to installing conventionally shaped wedges.

Suitably the base and upstanding portion are angled forwards in the direction of the taper. This further increases the thumb/wedge contact surface area and /or user comfort. Suitably angles of taper are between about 2° to about 12° relative to the vertical. More suitably, the rear pushing surface is inclined at a first angle at the base thereof and inclined at a second angle at the upper section thereof and the first angle is less than the second angle relative to the vertical. Such an arrangement may provide even more comfort for a tilers' thumb. Suitably the first angle is between about 2° and about 6° and the second angle between about 4° and about 8°.

It will be appreciated that the wedge as disclosed herein may be used with other clips in other tile levelling systems and is not limited to being used together with the clips as disclosed herein.

Also disclosed herein is a tile levelling system comprising the wedge as disclosed herein with a tile levelling clip.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 schematically shows a clip that has no lip prior to being inserted under a tile;

Figure 2 shows the clip of Figure 1 partially inserted under the tile;

Figure 3 shows the clip of Figure 1 inserted under the tile;

Figure 4 is a perspective view of one aspect of a clip as disclosed;

Figure 5 is a side view of the clip as shown in Figure 4;

Figure 6 is a perspective view of another aspect of a clip as disclosed;

Figure 7 schematically shows the clip shown in figure 6 prior to being inserted under a tile;

Figure 8 shows the clip of Figure 6 partially inserted under the tile;

Figure 10 shows the clip of Figure 6 inserted under the tile;

Figure 11 is a perspective view of a wedge as disclosed herein for use with the clip as shown in Figures 5 or 7; and

Figure 12 is a side view of the wedge shown in Figure 11.

DETAILED DESCRIPTION OF THE DRAWINGS

Figure 1 shows a side view of generic clip 10 prior to being positioned with respect to a tile 12 during the tile laying process. The clip 10 has a base 14 and an upstanding member 16. There is a frangible connection or break point 18 between the base 14 and the upstanding member. An opening 20 is defined in the upstanding member 18.

An adhesive bed 22 has been laid upon the substrate floor 24 upon which tile 12 has been placed. The clip 10 is angled for insertion into the adhesive bed 22 beneath the tile 12.

Figure 2 shows the clip 10 being pushed into the adhesive bed 22 below tile 12. It may be seen that there is excess adhesive 22a being forced up and onto the side edge 26 of the tile 12. Figure 3 shows the same clip 10 after one side 14a of the base 14 has been fully placed beneath tile 12. It may be seen that excess adhesive 22 has been pushed in along the side edge of the clip and covers the break point 20.

It will be appreciated that when a second tile is placed onto the other side 14b of the base 14 the excess adhesive 22 that is in the gap that is formed between the tiles may be forced up and onto the surface of the tiles. This requires manual removal by a tiler prior to grouting.

It will also be appreciated that adhesive 22a is located around break point 18, thereby interfering with breakage about the breakpoint.

Still further, excess adhesive in the space between the tiles can cause uneven spacing between the tiles.

When the second tile has been placed, a wedge is driven through opening 20 so as to provide a tile levelling force. Wedges used tile levelling systems of this type have an upper toothed surface that engages the upper edge of the opening so that the wedge can be held in position. When the wedge is driven into the opening as far as possible, the tiles are levelled with respect to each other.

The wedge may be driven by a dedicated tool or manually by the tiler placing the thumb behind a base of the wedge.

Figure 4 is a perspective view of one aspect of a clip 50 as disclosed herein. The clip 50 has a base 52. The base 52 is substantially rectangular in that it has two parallel side faces 54, 56 and opposed bowed out end faces 58, 60.

The upper edge of each side face 54, 56 has an upwardly angled lip 62, 64. The lips 62, 64 will be discussed in further detail below.

The clip 50 has an upstanding member 66 that has a head 68 and side arms 70, 72. The side arms 70, 72 have a thin frangible section 74, 76 where they connect to the base 52.

The lower parts of the arms 70a, 72a have a width that determines the spacing between the tiles.

An opening 78 is defined by the base 52, arms 70, 72 and head 68.

The head 68 has a lower thickened section 69 that extends part way down along each arm 70, 72 where it terminates as rounded projections 8a.

The rounded projections 8a can minimise or reduce the risk of the tile edges being damaged by the clips as they are being forcibly removed after the adhesive has set.

That part of the head 84 that is immediately adjacent opening 78 is not thickened to facilitate engagement with a toothed wedge as discussed below.

Figure 5 is a perspective view of a clip 51 of another aspect of the disclosure. This clip 51 is similar to that of clip 50 as shown in Figure 4 with the additional inclusion of a cross member 80 that extends across the lower part of the opening 78.

The same reference numerals will be used to denote the same features of the clip 51 as shown in figure 4.

Figure 6 is a side view of the clip 51 shown in Figure 5. It will be appreciated that the side view is the same for the clip 50 as shown in Figure 4.

In the side view, it can be seen that the head 68 has an upper section 82 that has a width W that is greater than the tile spacing width w of the lower parts of the arms 70a, 72a. An advantage of this thickened upper section 82 is that, in use, when a wedge is driven through opening 78 the thickened section 82 reinforces the clip against deformation. This means that more of the force applied to the wedge is being used to drive the wedge into the opening 78 so as to level the tiles rather than deform the clip. This improves the efficiency of the operation which again is desirable, especially when the wedges are being driven manually.

Figure 7 is a detail of one of the lips 62 that angularly extends away from the upper edge 56a of the side face 56.

The lip 62 extends at an angle α of 45° relative to the horizontal plane. The lip 62 has an upper face 62a and a lower face 62b. The lower face 62b of the lip 62 and the side face 56 define a V shaped adhesive contact surface.

The lower face 62b has a length that is longer than the length of the upper face 56a. This provides a thickened base 90 for the lip 62. The thickened base 90 provides a degree of support for the lip 62 so as to resist being deformed or moved during placement below a tile as will be described below. However, there is sufficient flexibility in the base 90 to allow the lip to be moved to a flattened horizontal position when a tile levelling force is applied.

Figure 8 shows a side view of either of clips 50, 51 prior to being positioned with respect to a tile 12 during the tile laying process. An adhesive bed 22 has been laid upon the substrate floor 24 which tile 12 has been placed. The clip 50, 51 is angled for insertion into the adhesive bed 22 beneath the tile 12.

Figure 9 shows the clip 10 being pushed into the adhesive bed 22 below tile 12. It may be seen that the adhesive 22 is being pushed away from the top of the base by lip 62. In practice a tiler would insert the clip 50, 51 in a manner that the lip 62 acts as a scraper blade or the like against the lower surface of the tile 12. In this way the adhesive is restricted from passing to the space at the side edge of the tile.

Figure 10 shows the same clip 50, 51 after a second tile 12a is placed onto the base and a wedge 100 placed through opening 78 so as to apply a tile levelling force. The tile levelling force has pushed the lips 62, 64 into a horizontal position flat against the lower surface of the tiles 12, 12a.

An advantage of this flexibility of the lips to lie flat is that there is no significant upwards force on the tile. This may be compared with prior art devices that have a convex base and/or flexible ends designed to accommodate tiles of different thicknesses. These clips provide an upward force on the lower surface of the tile to push the tile up and away from the adhesive, thereby risking compromising the coverage of the bonding of the adhesive with the tile.

It will be appreciated that with the presently disclosed clips, the seepage of adhesive into the grout gap between the tiles is reduced. The breakpoint is free from adhesive so that the upstanding member can readily be removed by force.

In the embodiment in which the clip 51 has a cross member, the cross member is located such that in use it locates below the top edge of the tile such that it does not interfere with introduction of the wedge into the opening. The cross member has the same width as the lower part of the arms 70a, 72a, that is the same width as the space between the tiles. This means that the lower part of the cross member may act as a stop for any adhesive that may have entered the joint from being pushed upwards towards the top of the tiles.

The cross member 80 can act as a back up in the event that adhesive does get past the lips and into the space between the tiles. The cross member 80 can stop or reduce excess adhesive from being pushed upwards above the tile edge. Figure 10 shows schematically where the cross member 80 is located with respect to the tile and it may be seen that the cross member 80 is located just below the top edge of the tile.

Figures 11 and 12 are respectively side perspective views of a preferred wedge 100 for use in combination with the clips 50, 51.

The wedge 100 has a toothed upper surface 102 that tapers from a base 104 towards a leading edge 106. The base 104 has a rear pushing surface 108 that is forwardly inclined towards leading edge 106. The rear pushing surface 108 has a base section 110 and an upper section 112 that stands proud of the toothed upper surface 102. The rear pushing surface 108 has slightly rounded edges 108a that is more comfortable for a tiler's thumb.

The base section 110 is at a first angle α of about 4° relative to the vertical and the upper section 112 is at a more obtuse angle β of about 8° relative to the vertical. It has been observed that this slight change in angle provides even more comfort and allows force to be applied more efficiently when compared with conventional wedges having a vertical back pushing portion with sharp corners.

The base also includes a rounded section 114 leading to a forwardly inclined section 116 transitioning to the toothed surface 102.

In use the leading edge 106 is inserted into the opening 80 of the clip 50, 51. The tiler places their first two fingers on the head of the clip 50, 51 and places their thumb on the rear pushing surface 108 of the wedge 100 so as to drive the wedge 100 through the opening

80 (as seen in Figure 10). The teeth are rearwardly angled such that the wedge can only move in the forwards direction. The angle, size and curvature of the base assists in the application of optimal force by the tiler, together with user comfort.

The force of the wedge within the clip forces the tiles to be level. After the adhesive cures, the clips may be removed by kicking or hotting with a mallet in the direction of the grout line.

It may be appreciated that the clips as disclosed herein may offer advantages over conventional clips in relation to the disadvantages associated with excess adhesive.

It will be appreciated that various changes and modifications may be made to the inventions as disclosed and claimed herein without departing from the spirit and scope thereof.

THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:

1. A clip for use in combination with a tile levelling member, the clip comprising:
a base having an underside surface, an upper surface, two opposed linear side faces, and two opposed end faces each linear side face having an upper side edge and a lower side edge and in use, one side face is located beneath the underside surface of a first tile and the other side face is located beneath a second adjacent tile;
an upstanding member connected to the upper surface that in use projects upwardly between the edges of the first tile and the second adjacent tile and that is configured to mechanically cooperate with a tile levelling member, wherein
one or each upper side edge includes an upwardly directed lip extending substantially along upper side edge.
2. The clip of any claim 1, wherein the or each lip is movable from the extended position to a position adjacent a lower tile surface in response to a tile levelling force.
3. The clip of claim 1 or claim 2, wherein the upstanding member comprises a substantially rectangular opening therein for receiving a wedge such that in use when the wedge is inserted into the opening, a tile levelling force is applied.
4. The clip of claim 3, wherein the opening is defined by the upper surface of the base, a head and two arms, each arm having an upper section and a lower section.
5. The clip of claim 4, wherein the lower section of each arm has a width that corresponds to a desired tile spacing.
6. The clip of claim 5, wherein the two arms are frangibly connected to the upper surface of the base at a position adjacent the base.
7. The clip of any one of claims 3 to 6, that further comprises a cross member extending across the opening.
8. The clip of any one of claims 4 to 7 wherein, the upper section of each arm is thickened relative to the lower section of each arm.

9. The clip of any one of claims 1 to 8, wherein the base is generally rectangular with the upstanding member extending along the longitudinal center line thereof.
10. The clip of claim 8, wherein the end faces are curved or bowed out.
11. The clip of any one of claims 1 to 10, wherein the lip is upwardly angled relative to the horizontal at an angle of between about 27° to about 63° suitably between about 35° to about 55°, suitably about 45° relative to the horizontal.
12. The clip of any one of claims 1 to 11, wherein a lip is located on each upper edge of each side face of the base.
13. The clip of any one of claims 1 to 12, wherein the upstanding member is frangibly connected to the base at a break away position adjacent the base.
14. The clip of claim 1 or claim 2, wherein the upstanding member is a ratchet stem and the tile levelling member has a pawl, so that the tile levelling member can move downwards along the stem towards the tile so as to apply a tile levelling pressure thereon.
15. A tile levelling system comprising a clip of any of claims 1 to 134 and a tile levelling member.
16. A tile levelling system comprising a clip of any one of claims 3 to 13, and a tile levelling member, wherein the tile levelling member is a wedge.
17. The tile levelling system of claim 16, wherein the wedge comprises a base end, an upper surface that tapers down from the base end towards a leading edge end, and the base end includes a finger contacting section upstanding from the tapered upper surface.
18. The tile levelling system of claim 17, wherein the base and upstanding portion are forwardly inclined in the direction of the leading edge.

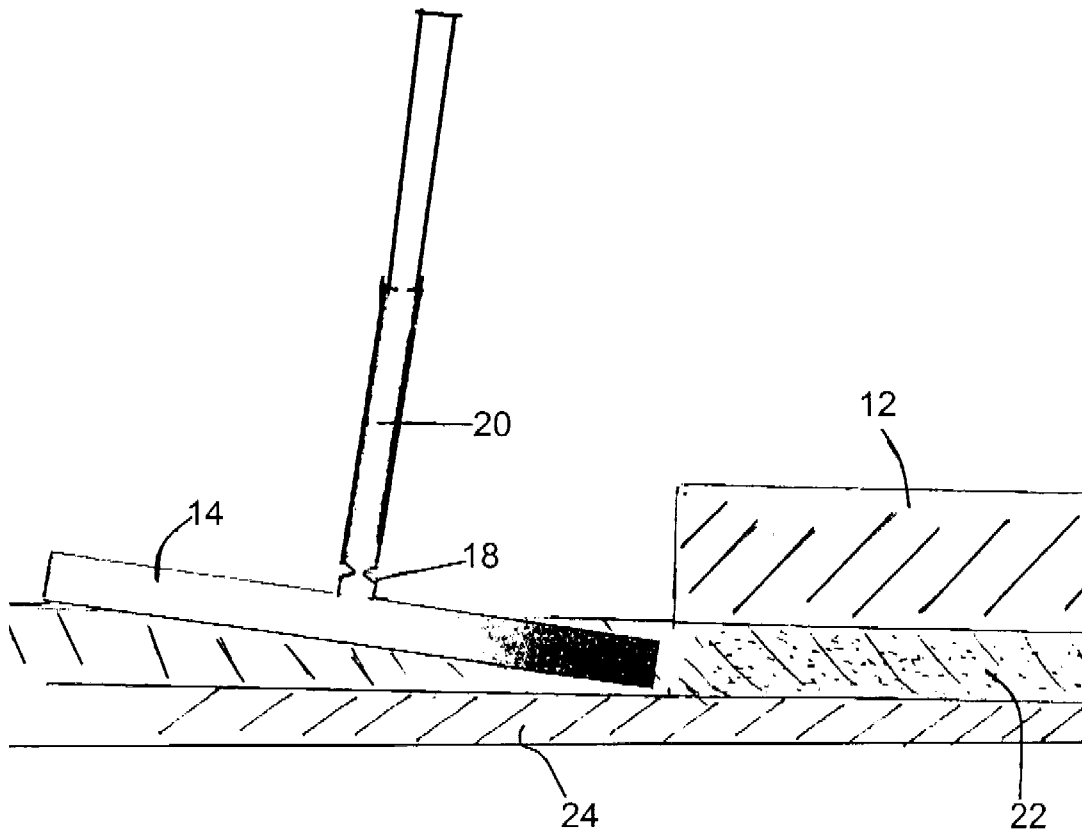


Fig. 1

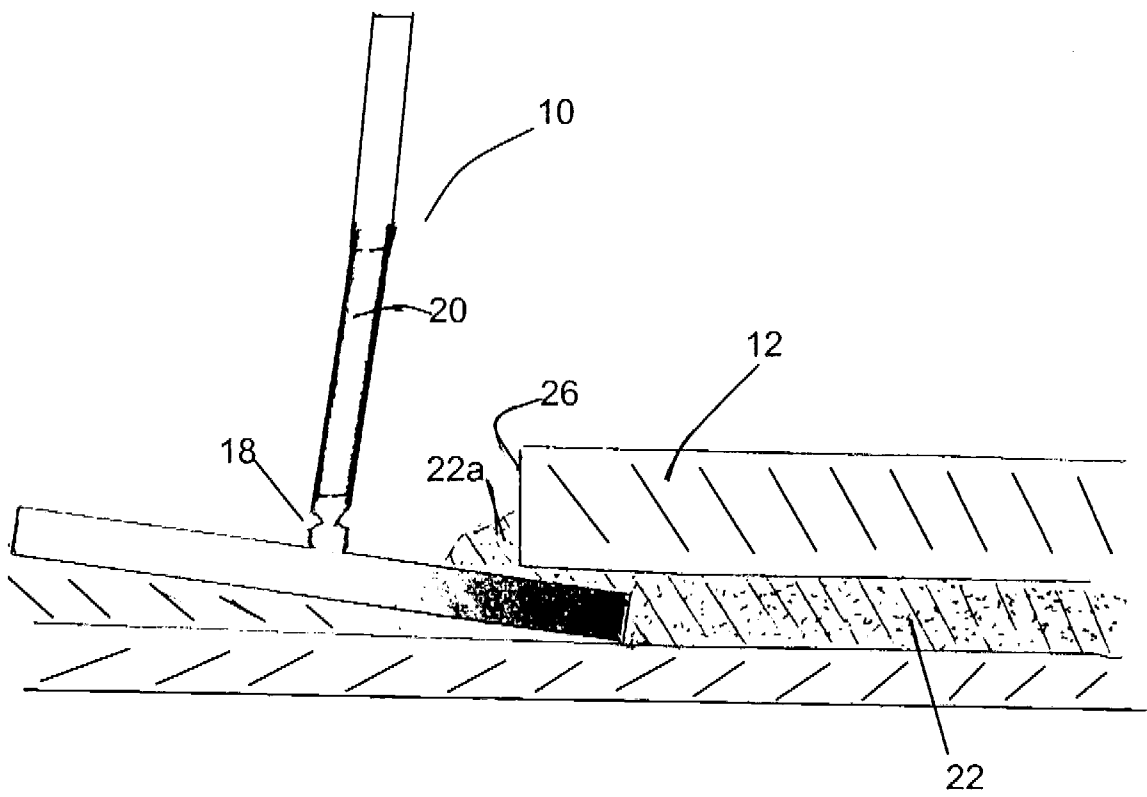


Fig. 2

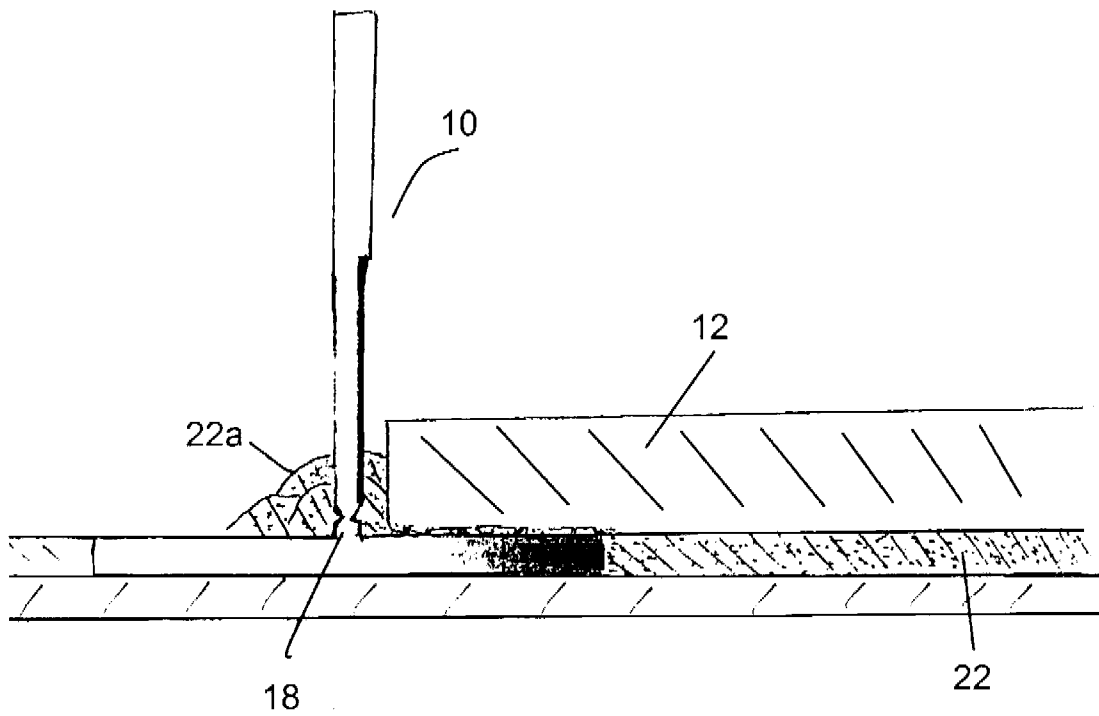


Fig. 3

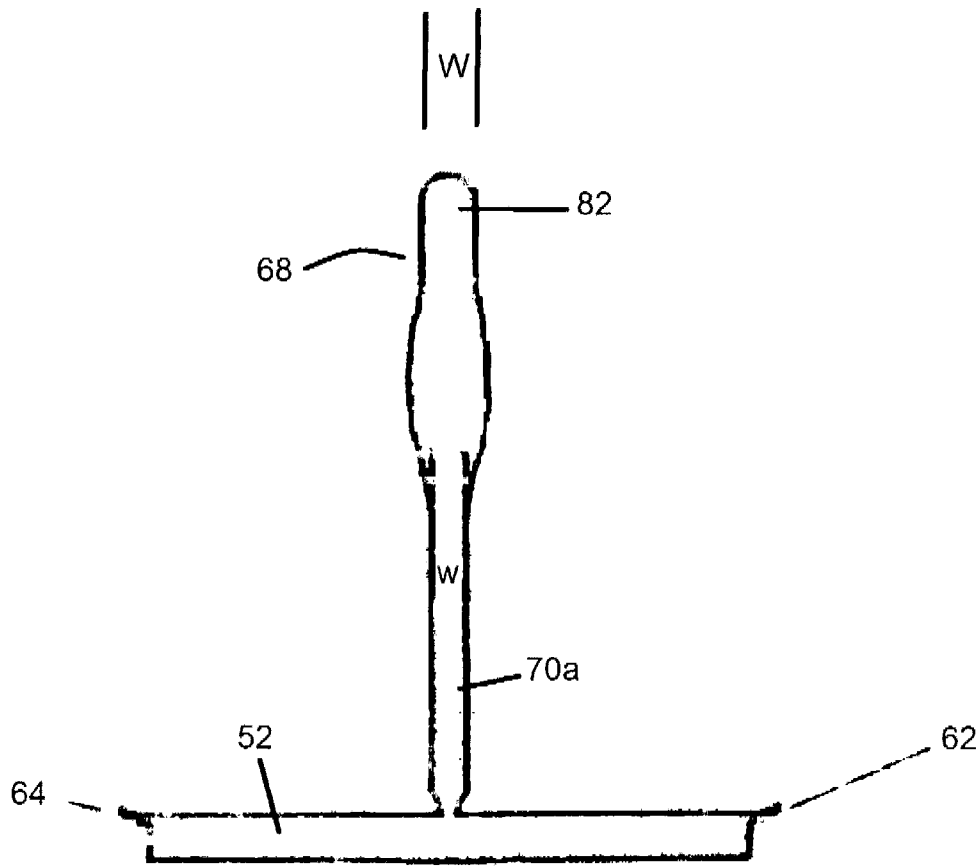


Fig. 6

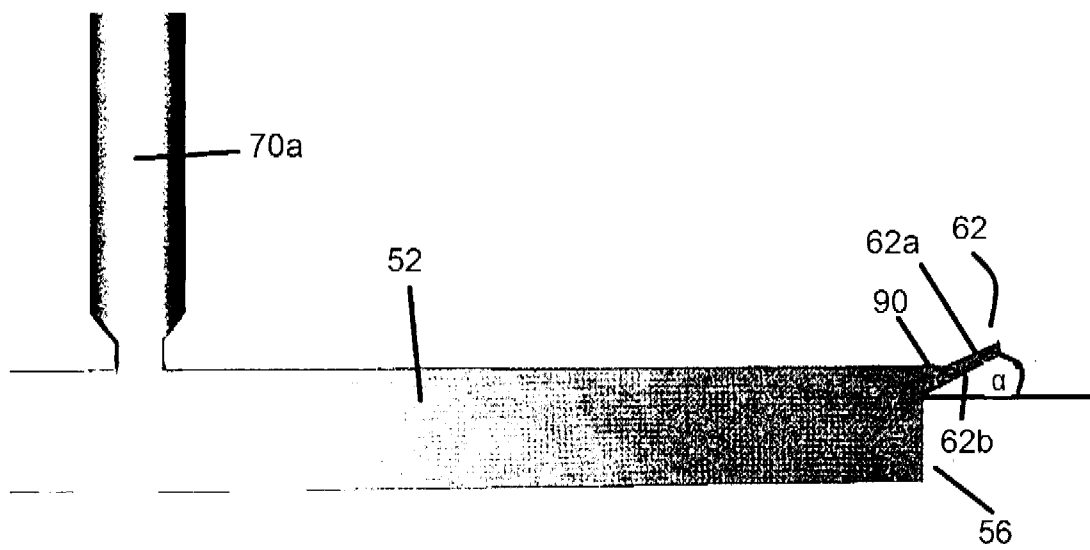


Fig. 7

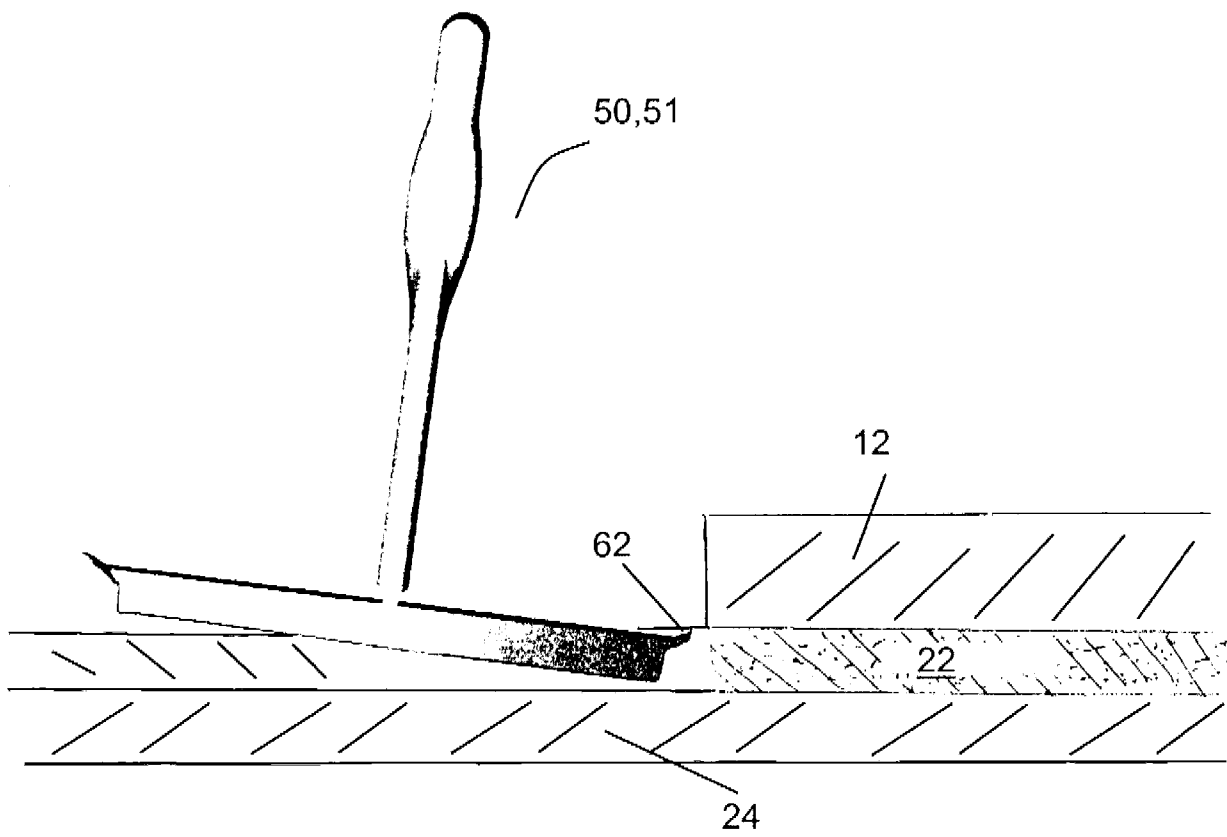


Fig. 8

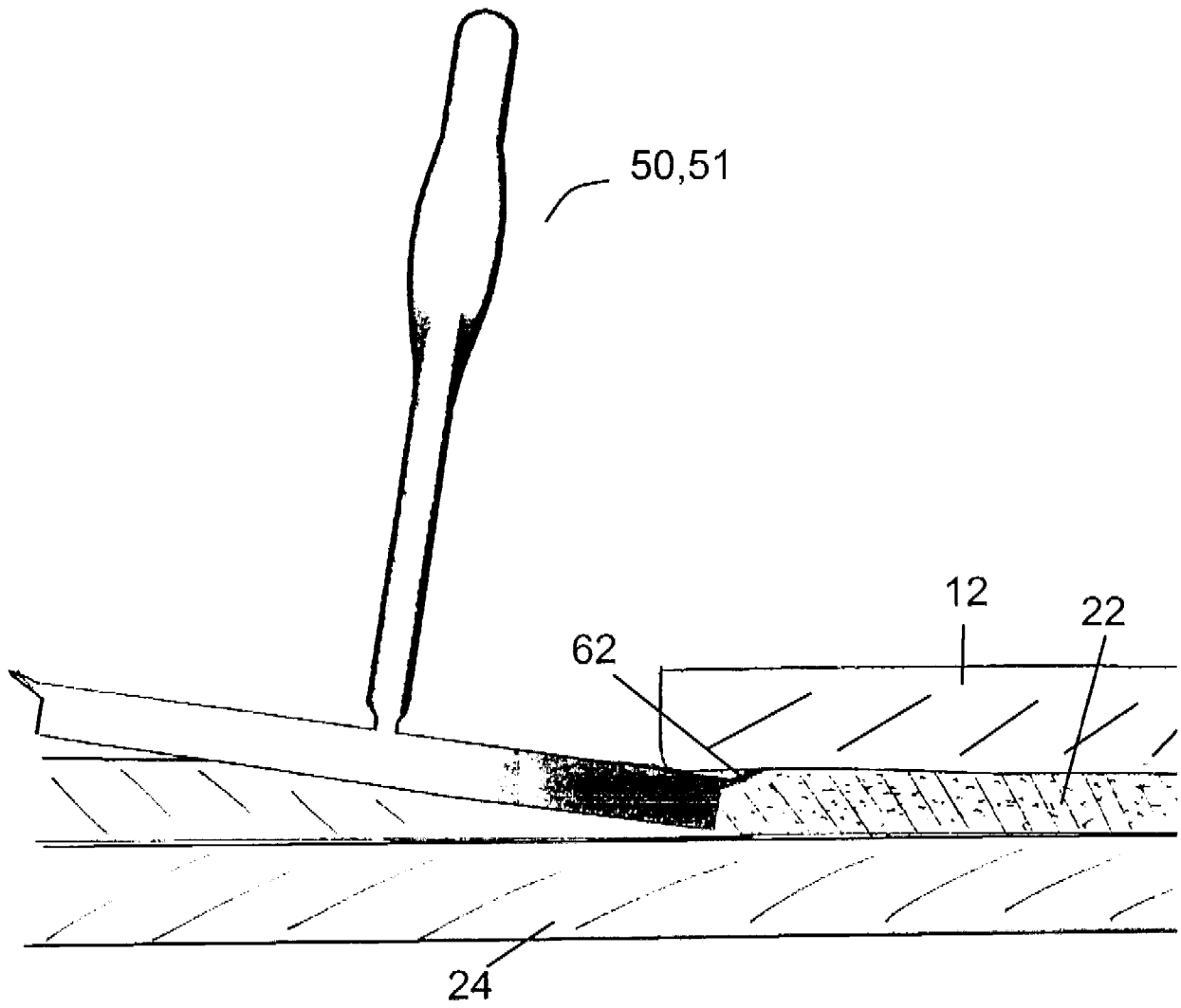


Fig. 9

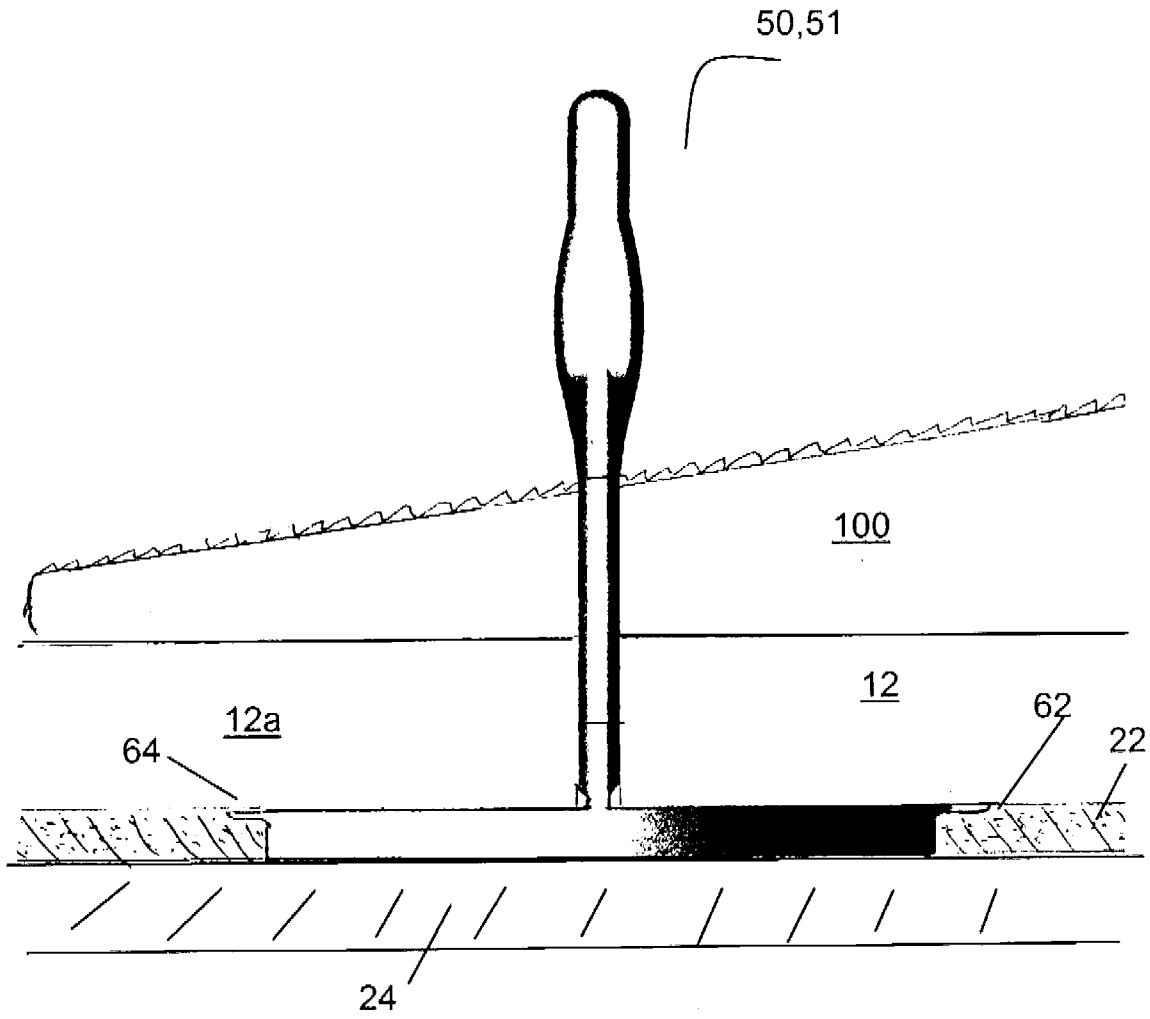


Fig. 10

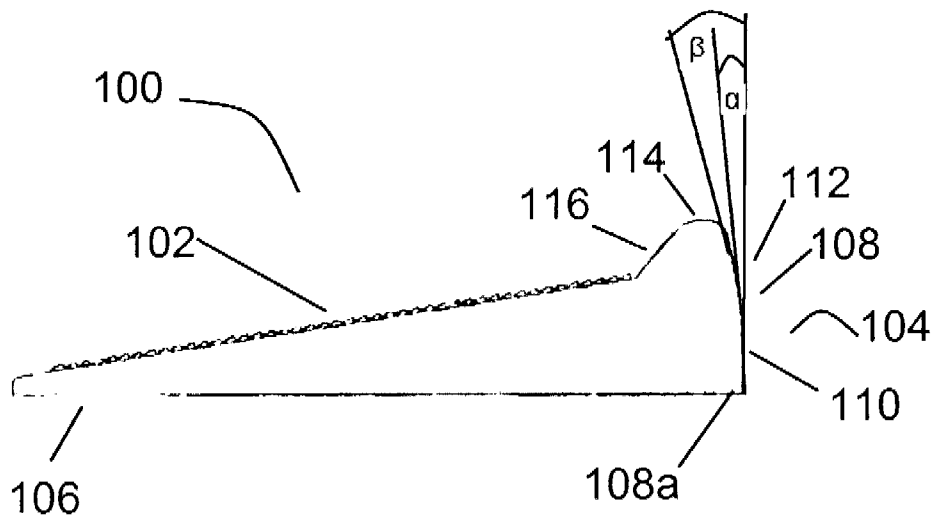


Fig. 11

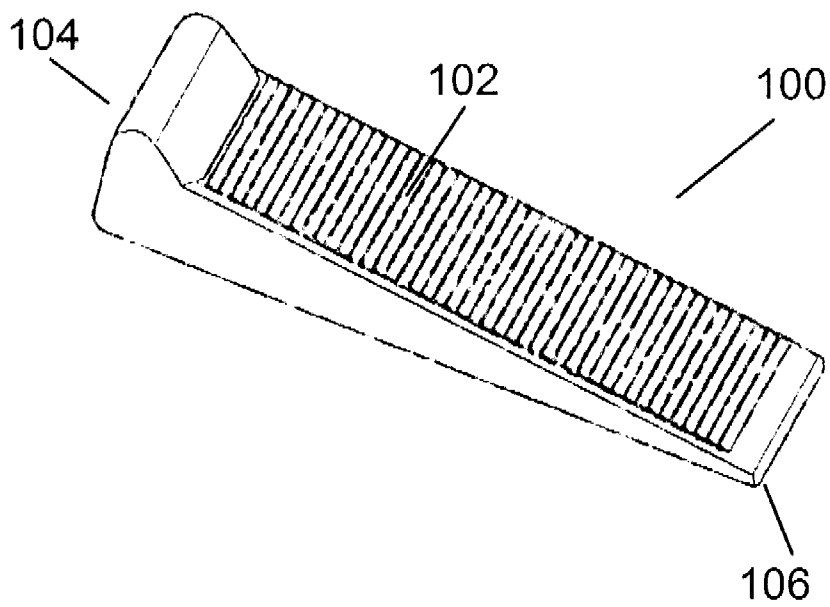


Fig. 12

A. CLASSIFICATION OF SUBJECT MATTER

E04F 21/18 (2006.01)

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPODOC, WPIAP & TXTE: IC/CC/ E04F21/1877, E04F21, E04F15, E01C5 & KW(Lip, edge, periphery, upwardly, raised, protrude, Tile, paver, slab, spacer, leveller, flattener, even, rectangle, shape, bottom, base, arm, shaft, stem, break, frangible, and similar terms); **Espacenet:** Applicant/Inventor name search & E04F, E01C.; **Other:** Applicant(s)/Inventor(s) name searched in internal databases provided by IP Australia

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
	Documents are listed in the continuation of Box C	

 Further documents are listed in the continuation of Box C
 See patent family annex

* Special categories of cited documents:		
"A" document defining the general state of the art which is not considered to be of particular relevance	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention	
"E" earlier application or patent but published on or after the international filing date	"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone	
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art	
"O" document referring to an oral disclosure, use, exhibition or other means	"&" document member of the same patent family	
"P" document published prior to the international filing date but later than the priority date claimed		

Date of the actual completion of the international search
2 May 2017Date of mailing of the international search report
02 May 2017

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Telephone No. 0262832130

INTERNATIONAL SEARCH REPORT

International application No.

C (Continuation).

DOCUMENTS CONSIDERED TO BE RELEVANT

PCT/AU2017/000047

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2014/0298736 A1 (BUNCH et al.) 09 October 2014 Abstract, Para 0031, 0033 & Figs 10-14	1-18
X	US 8336279 B2 (KUFNER et al.) 25 December 2012 Col 3 lines 44-58, Col 4 lines 45-46 & Fig 7-9	1-2 & 12-15
X	WO 1992/014012 A2 (ACCORNERO, GUIDO) 20 August 1992 Figs 1-2	1

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/AU2017/000047

This Annex lists known patent family members relating to the patent documents cited in the above-mentioned international search report. The Australian Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

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End of Annex

Due to data integration issues this family listing may not include 10 digit Australian applications filed since May 2001.

Form PCT/ISA/210 (Family Annex)(July 2009)