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Shelf bracket with two stage support

The invention relates to a shelf bracket for securing to a body wall of wood or wood material, comprising an angular piece having a leg which is vertical in the assembly position and having a leg which is horizontal in the assembly position, and a wall pin which is for insertion into a hole of the body wall and which is formed so as to protrude horizontally at the outer side of the vertical leg.

In conventional shelf brackets of this type, the outer sides of the two legs are arranged at right angles with respect to one another. The wall pin of these conventional brackets is normally continuously pulled out of the hole when loaded. In order to prevent this from happening, so-called wedge-shaped noses are formed at the top of the wall pin, which cut into the hole wall and thereby improve anchoring of the wall pin in the hole.

DE 91 00 135 U1 discloses a multi-part support arm for shelves of shelf systems with vertical pattern perforated rails for receiving the support arms. The support arm comprises a hanging part of an approximately rectangular profiled body which comprises two tongue-shaped insertion sections which extend parallel to one another in the longitudinal direction of the profiled body, thereby forming at least one slot-shaped recess which extends from one end of the profiled body, and at its other end two perforated rail engagement arms arranged at a distance from one another, the upper engagement arm of which is in a slightly inclined position with respect to the lower engagement arm and comprises at its edge facing the lower engagement arm two holding slots which are arranged at a distance from each other and extend transversely to the longitudinal direction of the engagement arm and whose central longitudinal axes extend at an inclination with respect to each other and the lower engagement arm has at its outside edge two holding slots which extend approximately transversely to the longitudinal direction of the engagement arm and the central longitudinal axes of which extend at an inclination with respect to each other and are arranged at a distance from each other.
DE 20 2007 007 637 U1 moreover discloses a shelf board holder for supporting a shelf board. The shelf board holder has the shape of an angular piece with two legs arranged at right angles with respect to one another, wherein a first one of the two legs has on its outer side a hook-shaped projection and a first pin-shaped projection arranged at a distance therefrom, via which the shelf board can be mounted to a perforated wall such that the outer side of the first leg finally abuts the wall and is aligned therewith, whereas the second leg extends perpendicularly away from the wall for receiving the shelf board, wherein the hook-shaped projection can be guided through a wall hole in the course of a pivoting motion of the shelf board holder such that its free end abuts the wall side facing away from the shelf board holder, and the first pin-like projection can be inserted into another wall hole at the end of the pivoting motion.

It is the object of the present invention to further develop a shelf bracket of the above-mentioned type in such a manner that its anchoring in the hole is further improved.

In accordance with the invention, this object is achieved in that the outer sides of the two legs define an angle $\alpha$ of between 85° and 88°, in particular of approximately 87°, and that the outer side of the vertical leg has a projection below the horizontal wall pin for abutment on the body wall (so-called “variable support”), the end face of which defines an angle $\beta$ with the outer side of the horizontal leg, which is greater than the angle $\alpha$ and is maximally 90°.

In accordance with the invention, the angle between the support side of the horizontal leg and the support side of the vertical leg is less than 90°, namely between 85° and 88°. The small projection protruding from the outer side of the vertical leg defines a first support stage of the vertical leg of preferably 90° and is pressed into the body wall when loaded until the support side of the vertical leg abuts the body wall. Since the horizontal support side is then slightly inclined in a downward direction, the support point of a supported shelf is located on the horizontal leg close to the body wall such that a relatively small leverage acts on the horizontal leg.
The projection preferably directly follows the horizontal wall pin and merges at least laterally and/or below into the outer side of the vertical leg.

The free end of the horizontal wall pin has preferably one or more radially outwardly projecting cutting edges (e.g. wedge-shaped noses) on its upper side, which can cut into the upper hole wall of the hole in order to anchor the shelf bracket in the hole of the body wall.

The wall pin still preferably has on its lower side a support portion which merges via an inwardly recessed undercut portion into the outer side of the vertical leg. The undercut portion facilitates tilting of the support portion on the lower hole wall and can be embedded with its sharp edge in the lower front hole wall, thereby filling the undercut portion with wood of the body wall and additionally preventing removal of the wall pin from the hole.

In case of a shelf having a hole on the lower side, a vertically upwardly protruding retention pin can be formed on the outer side of the horizontal leg, onto which the shelf is placed with its hole. In case of a glass shelf, a rubber pad can be provided on the outer side of the horizontal leg as support for the glass shelf.

The invention also relates to an arrangement having a body wall, a shelf and a shelf bracket in accordance with the invention, which is anchored with its horizontal wall pin in a hole of the body wall, wherein the shelf is supported on the horizontal leg of the shelf bracket and wherein the projection of the shelf bracket is pressed into the outer side of the body wall.

The cutting ribs of the wall pin preferably engage in the upper hole wall of the body wall and the undercut portion of the wall pin is embedded in the lower hole wall of the body wall.

Further advantages of the invention can be extracted from the description, the claims and the drawing. The features mentioned above and below may be used
individually or collectively in arbitrary combination. The embodiment shown and described is not to be understood as an exhaustive enumeration but has exemplary character for describing the invention.

In the drawing:
Figs. 1a-1c show the inventive shelf bracket in side view (Fig. 1a) and in two perspective views (Figs. 1b, 1c); and
Figs. 2a-2c show the inventive shelf bracket on a body wall in an initial position without shelf (Fig. 2a), in a neutral position with horizontal shelf (Fig. 2b) and in a loaded position with sagging shelf (Fig. 2c).

The shelf bracket 1 illustrated in Figs. 1a to 1c is made in one piece (e.g. of zinc die casting) and is used to mount shelves (shelf boards) to a body wall of wood or of a derived timber product (chipboard, MDF, HDF, ...).

The one-piece shelf bracket 1 consists of an angular piece 2, a wall pin 3 which horizontally protrudes from the flat outer side (support side) 4 of one leg 5 of the angular piece 2, which is vertical in the mounting position, and an optional retention pin 6 which vertically upwardly protrudes from the flat outer side (support side) 7 of the other leg 8 of the angular piece 2, which is horizontal in the mounting position. The horizontal wall pin 3 is arranged on the outer side 4 of the vertical leg 5 at approximately the height of the horizontal leg 8 but could also be arranged much lower.

The outer sides 4, 7 of the two legs 5, 8 define an angle $\alpha$ of only approximately 87°. A short projection 10 slightly protruding from the outer side 4 is formed directly below the horizontal wall pin 3 on the outer side 4 of the vertical leg 5, the end face of which defines with the outer side 7 of the horizontal leg 8 an angle $\beta$ of 90° ($\alpha < \beta \leq 90^\circ$). As is shown, the projection 10 can be formed in a triangular manner with a tip which faces downwards but may alternatively also have any other shape. This projection 10 merges laterally and at the bottom into the outer side 4 of the vertical leg 5.
The free end of the horizontal wall pin 3 has on its upper side three radially outwardly protruding cutting edges in the form of semi-ring shaped cutting ribs (wedge-shaped noses) 11a-11c which are axially offset with respect to each other. The rib height of the cutting ribs 11a-11c increases from the inner cutting rib 11a towards the outer cutting rib 11c, i.e. the outer cutting rib 11c has the maximum rib height. The wall pin 3 has on its lower side a semicircular support portion 12, one end of which merges via an upwardly recessed (e.g. conical) undercut portion 13 into the outer side 4 of the vertical leg 5 and the other end of which has an inclined surface 14 which tapers towards the pin end face. The support portion 12 of the wall pin 3 is preferably additionally roughened.

Figs. 2a-2c show different installation positions of the shelf bracket 1 for fixing a shelf 21 to a solid wooden furniture body wall 22.

Fig. 2a shows the initial position of the shelf bracket 1 which is initially provisionally inserted with its wall pin 3 at an inclination of approximately 12° into a hole 23 of the body wall 22.

The shelf 21 is supported with a hole 24 on the retention pin 6 and positioned on the support surface 8 of the shelf bracket 1 and the shelf bracket 1 is moved into the neutral (horizontal) position illustrated in Fig. 2b. The shelf bracket 1 tilts into a horizontal position, thereby pivoting about the semicircular support portion 12 of the wall pin 3 which is supported to the bottom flush with adjacent areas in the entrance area of the hole 24 until the projection 10 abuts the body outer side 25 (first support stage) and the cutting ribs 11a-11c cut into the upper end area. The cutting ribs 11a-11c can grip into the hole 23 of the body wall 22 before the load becomes too large. The outer side 4 is aligned with a small distance from the body outer side 25 due to the projection 10. As a result, the cutting ribs 11a-11c are anchored in the hole 23 and the semicircular support portion 12 of the wall pin 3 abuts the bottom of the hole 23 flush with adjacent areas. Upon initial exertion of load on the shelf 21, the shelf bracket 1 tilts further into the position shown in Fig. 2c until the outer side 4 of the vertical leg 5 abuts the outer side of the body 25 (second support stage). The projection 10 thereby presses its tip facing
downwards into the outer side 25 of the body wall 22 without thereby pulling the anchored wall pin 3 out of the hole 23. The undercut portion 13 facilitates additional tilting downwards and digs with its sharp edge into the lower front hole wall of the hole 23, thereby filling the undercut portion 13 with wood of the body wall 22 and additionally counteracting pulling out of the wall pin 3. As a result, the shelf bracket 1 can bear higher loads. Since the outer side 7 of the horizontal leg 8 is then slightly inclined in a downward direction, the support point of the shelf 21 is close to the body wall 22 such that a relatively small leverage acts on the horizontal leg 8. The shelf bracket 1 can altogether have a certain degree of elasticity in order to absorb larger loads by bending.
1. Hyldeknægt (1) til fastgørelse til en korpusvæg (22) af træ eller træmateriale, omfattende et vinkelstykke (2) med et i monteringspositionen lodret ben (5) og et i monteringspositionen vandret ben (8) og en vægtap (3) til indføring i et borehul (23) i korpusvæggen (22) som på ydersiden (4) af det lodrette ben (5) er udformet til at rage vandret ud,
  k e n d e t e g n e t v e d , at ydersiderne (4, 7) af de to ben (5, 8) indeslutter en vinkel (α) mellem 85° og 88°, især på omkring 87°, og at ydersiden (4) af det lodrette ben (5) nedenfor den vandrette vægtap (3) omfatter et fremspring (10) til anlæg mod korpusvæggen (10), hvis forside som sammen med ydersiden (7) af det vandrette ben (8), indeslutter en vinkel (β), som er større end vinklen (α) og maksimalt er 90°.

2. Hyldeknægt ifølge krav 1, k e n d e t e g n e t v e d , at fremspringet (10) støder direkte op til den vandrette vægtap (3).

3. Hyldeknægt ifølge krav 1 eller 2, k e n d e t e g n e t v e d , at fremspringet (10) i det mindste på siderne og/eller for neden går over i ydersiden (4) af det lodrette ben (5).

4. Hyldeknægt ifølge et hvilket som helst af de foregående krav, k e n d e t e g n e t v e d , at fremspringet (10) er udformet trekantet med en nedadpegende spids.

5. Hyldeknægt ifølge et hvilket som helst af de foregående krav, k e n d e t e g n e t v e d , at den frie ende af den vandrette vægtap (3) på sin overside omfatter et eller flere radiaalt udadragende skærekanter (11a-11c).

6. Hyldeknægt ifølge krav 5, k e n d e t e g n e t v e d , at skærekanten er udformet som en skærerribbe (11a-11c).

7. Hyldeknægt ifølge et hvilket som helst af de foregående krav, k e n d e t e g n e t v e d , at vægtappen (3) på sin underside, omfatter en understøtningsdel (12), som via en indad tilbagetrukket underskæring (13) går over i ydersiden (4) af det lodrette ben (5).

8. Hyldeknægt ifølge et hvilket som helst af de foregående krav, k e n d e t e g n e t v e d , at på ydersiden (7) af det vandrette ben (8) er der udformet en lodret opad ragende holdetap (6).

9. Anordning med en korpusvæg (22), en hylde (21) og med en hyldeknægt (1) ifølge et hvilket som helst af de foregående krav, som med dens vandrette vægtap (3) er forankret i et borehul (23) i korpusvæggen (21), hvor hyliden (21) hviler på det vandrette ben (8) af hyldeknægten (1), og hvor fremspringet (10) af hyldeknægten (1) trykkes ind i den udvendige side (25) af korpusvæggen (22).

10. Anordning ifølge krav 9, k e n d e t e g n e t v e d , at den ene eller flere skærende ribber (11a-11c) af vægtappen (3) går i indgreb med den øvre væg af borehullet (23) i korpusvæggen (22).
11. Anordning ifølge krav 9 eller 10, k e n d e t e g n e t ved, at underskæringen (13) af vægtappen (3) er gravet ned i den nedre borevæg af borehullet (23) i korpusvæggen (22).

12. Anordning ifølge et af kravene 9 til 11, k e n d e t e g n e t ved, at hyldeknægten (1) med en lodret holdetap (9) er forankret i et borehul (24) i hylden (22).