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(54) **Suspension device for ceiling panels**

Aufhängeeinrichtung für Deckenplatten

Dispositif de suspension pour panneaux de faux plafonds

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## Description

**[0001]** The invention relates to a suspended ceiling system comprising suspended ceiling panels, wherein each panel comprises a body plate and standing wall parts being arranged at least in the corners thereof, wherein said wall parts enclose a mutual angle, wherein said panel is suspended in a support frame using suspension means, which consist of a pin-like member which is received slidably through legs, of a U-shaped sub-frame placed in the corner of said panel, said pin-like member being biased by a tensioning member and protruding beyond said standing wall part.

**[0002]** Many suspension devices for ceiling panels are already known, see for instance DE-U-9004023, which however all have the drawback of a complicated construction or are difficult to handle.

**[0003]** The invention has for its object to improve the suspension device for panel-like ceiling elements such that it is necessary to work with only a minimum number of different components to suspend the element, but such that the element can be released and/or swung aside.

**[0004]** The device according to the invention is distinguished in that one of the standing wall parts is provided with an inwardly bent flange being locally interrupted to form one or more bending lips for fixing said sub-frame and wherein said legs are provided with holes to support and allow passage of a control lever which engages the pin-like body.

**[0005]** So the sub-frame can be placed by means of simple fastening members in the corner portion of the panel in both a "left-hand" and "right-hand" embodiment.

**[0006]** Although it is possible to use the sub-frame as pivoting support provided with a fixed pin-like member the sub-frame can also be used as lock, wherein said movable pin-like member can be moved back and forth by said simple lever.

**[0007]** Above mentioned and other features of the invention will be further elucidated in the figure description hereinbelow of an embodiment. In the drawing:

fig. 1a-f show in each case a perspective bottom view of a ceiling in a random space, which ceiling is embodied with panel-like ceiling elements,

fig. 2 shows a perspective view of a detail of the corner of the panel-like ceiling element of fig. 1,

fig. 3a, b show a perspective view corresponding with fig. 2 of the corner part of the ceiling element provided with a sub-frame with fixed pin-like member,

fig. 4 shows a perspective view corresponding with fig. 2 provided with a pin-like member movable in axial sense as a lock,

fig. 5a, b and c show a perspective view of the locking system of fig. 4 in dismantled state and as a left-hand mounted and right-hand mounted pin-like

member.

**[0008]** In fig. 1 the space R is embodied with a ceiling P, which ceiling consists of a plurality of panel-like ceiling elements 1 in mutually adjacent arrangement. These elements are suspended in a suspension frame 2, consisting here for instance of angle beams, which can be arranged in the space R in random manner. Such ceiling panels 1 must not only be capable of easy fitting in suspension frame 2 but must also be releasable in order to enable replacement of the elements or to make the space above the ceiling panels accessible, for instance for work on conduits and the like.

**[0009]** The panel-like ceiling element comprises a flat body part having in the embodiment shown a rectangular peripheral form, along which periphery standing wall parts 4 are arranged to form a cassette-like panel.

**[0010]** The standing wall parts 4 enclose at the corners an angle of 90° but it will be apparent that with a different peripheral form other angle settings can be realized.

**[0011]** The right angle between the standing wall parts 4 is shown in detail in fig. 2-4.

**[0012]** Fig. 2 shows that the standing wall parts 4 are provided on the edge remote from body plate 3 with an inward bent flange 5, 6, wherein flange 6 has recesses 7 for the purpose of forming bending lips 8.

**[0013]** In the standing wall part 4 not provided with bending lips 8 are arranged respective openings 9 and 10, the function of which is further elucidated below.

**[0014]** In order to enable suspension of the ceiling elements 1, suspension means in the form of a fixed pin, see fig. 3a, 3b, or a slidable pin, see fig. 4, 5, are arranged in the corners.

**[0015]** Fig. 3a and 3b show that a fixed pin in the form of a bolt can be carried through the hole 9 and through two support plates 12, 13 arranged at a mutual distance. The support plates 12, 13 are mutually connected by a plate 14 such that a U-shaped sub-frame is formed. Each plate 12, 13 is provided with a hole 15 which coincides with the hole in the standing wall 4 placed in the sub-frame in the corner.

**[0016]** Each support plate 12, 13 is provided with holes 16 corresponding with the holes 10 in fig. 2 in addition to incisions 17 respectively 18 arranged close to these holes 16, and a hole 19.

**[0017]** Mounting of the fixed bolt 11 takes place by sliding the sub-frame into the corner of the panel-like element such that the hole 15 is in register with the hole 9 in standing wall 4.

**[0018]** The bending lip 8 is folded inward against the inside of plate 14, whereby the sub-frame is fixed into the corner. The bolt 8 is subsequently fastened to the left-hand support plate 13 in fig. 3b by means of two nuts 20. The bolt head of bolt 11 protrudes some distance on the outside of the standing wall 4, see fig. 3b, whereby this bolt head can be fixed to the sub-frame 2 in fig. 1. The bolt head can for instance be hung in a recess of

angle profile 2 opening toward the top. Alternatively, a circular hole can be arranged in the angle profile 2 through which the bolt must first be placed prior to being fixed to the sub-frame in the panel-like element.

[0019] It will be apparent that two bolts 11 are arranged mutually in line at either end of the rear standing wall part 4 in order to form a pivot axis. The slidable pins 21 can be mounted as according to fig. 4 on the two remaining corners of the panel-like ceiling element. The sub-frame consisting of support plates 12, 13 and 14 is once again placed in the corner, wherein however the pin 21 is placed in advance through holes 15, round which pin a pressure spring 22 is arranged, see fig. 5b. Mounted simultaneously with pin 21 is a lever 23 consisting of an L-shaped strip, the short leg of which is embodied with protrusions 24, which are received in the holes 19 of the sub-frame, and a lip 25 which can be placed through hole 10. Fig. 5b further shows that fitting of lever 23 takes place by bending the lower portion of support plate 12 respectively 13, depending on the left-hand or right-hand embodiment, see fig. 5b and c. The lip 25 protrudes through the hole 10 of the standing wall parts 4 so that it is accessible from outside.

[0020] The sub-frame with arranged pin and lever as according to fig. 5b and c is fixed in the same manner in the corners of a ceiling panel using the bending lip. For fitting of the ceiling panel it is only necessary to press against the lip 25 with an auxiliary tool, for instance a pressing plate 30 in fig. 1b, 1c, to cause the lever 23 to tilt on the tilt axis through the holes 19. The strip 23 which fits into a recess 26 of pin 21 presses the pin inward counter to the action of pressure spring 22. The ceiling panel can thus be placed flush with the angle profiles 2 and, by releasing the lip 25, the pressure spring 22 will push back pin 21 into a recess prearranged in the angle profiles 2. In this manner the ceiling panel is fixed. The ceiling panel can also be swung aside again by carrying out the reverse operation, which is shown in fig. 1e and f.

## Claims

1. A suspended ceiling system comprising suspended ceiling panels (1), wherein each panel (1) comprises a body plate (3) and standing wall parts (4) being arranged at least in the corners thereof, wherein said wall parts (4) enclose a mutual angle, wherein said panel (1) is suspended in a support frame (2) using suspension means, which consist of a pin-like member (21) which is received slidable through legs (12,13) of a U-shaped sub-frame (14) placed in the corner of said panel, said pin-like member (21) being biased by a tensioning member (22) and protruding beyond said standing wall part (4), **characterized in that** one of the standing wall parts (4) is provided with an inwardly bent flange (5,6) being locally (7) interrupted to form one or more bending lips (8) for fixing said sub-frame (14) and wherein

said legs (12,13) are provided with holes (15,16) to support and allow passage of a control lever (23-25) which engages the pin-like body (21).

2. Device as claimed in claim 1, **characterized in that** the legs have local incisions to obtain bending lips (19).

## Patentansprüche

1. Hängedeckensystem mit aufgehängten Deckenplatten (1), bei dem jede Platte (1) eine Körperplatte (3) und zumindest in deren Ecken angeordnete, stehende Wandabschnitte (4), die zusammen einen Winkel bilden, umfasst, wobei die Platte (1) unter Verwendung einer Aufhängeeinrichtung, die ein stiftähnliches Element (21), das in die Schenkel (12, 13) eines in der Ecke dieser Platte angeordneten, U-förmigen Unterrahmens (14) verschiebbar eingeführt wird, umfasst, in einem Tragrahmen (2) aufgehängt ist, wobei das stiftähnliche Element (21) durch ein Spannelement (22) vorbelastet ist und über den stehenden Wandabschnitt (4) hinausragt, **dadurch gekennzeichnet, dass** einer der stehenden Wandabschnitte (4) mit einem nach innen gebogenen Flansch (5, 6), der an manchen Stellen (7) unterbrochen ist, um einen oder mehrere Biegevorsprünge (8) zur Befestigung des Unterrahmens (14) zu bilden, versehen ist, und die Schenkel (12, 13) mit Löchern (15, 16) zum Halten und Hindurchführen eines Steuerhebels (23- 25), der in das stiftähnliche Element (21) eingreift, versehen sind.
2. Vorrichtung nach Anspruch 1, **dadurch gekennzeichnet, dass** die Schenkel stellenweise Einschnitte aufweisen, um Biegevorsprünge (19) zu erhalten.

## Revendications

1. Plafond suspendu comprenant des panneaux (1) de plafond suspendu, selon lequel chaque panneau (1) comprend une plaque de corps (3) et des parties (4) de parois verticales étant disposées au moins dans les angles de ces derniers, selon lequel chacune desdites parties (4) de parois enveloppe un angle mutuel, selon lequel ledit panneau (1) est suspendu dans un cadre-support (2) à l'aide de moyens de suspension, qui se composent d'un élément de type broche (21) qui vient se loger en vue de son coulissement dans les branches (12, 13) d'un sous-cadre en forme de U (14) placé dans l'angle dudit panneau, ledit élément de type broche (21) étant décalé par un élément de mise sous tension (22) et débordant au-delà de ladite partie de paroi

verticale (4),

**caractérisé en ce qu'**une des parties (4) de parois verticales est pourvue d'une bride (5, 6) recourbée vers l'intérieur, localement (7) interrompue pour former une ou plusieurs languettes (8) incurvées pour fixer ledit sous-cadre (14) et selon lequel lesdites branches (12, 13) sont pourvues de trous (15, 16) pour supporter et permettre le passage d'un levier de commande (23-25) qui se met en prise avec le corps de type broche (21). 5 10

2. Dispositif selon la revendication 1, **caractérisé en ce que** les branches présentent des fentes locales pour constituer des languettes recourbées (19). 15

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