

Description

THIS INVENTION relates to improvements to building panels and particularly to building panels for use in the construction of self supporting building structures.

A number of different types of self-supporting building structures are presently available. One such type of building structure described in Australian Patent No. 477,874, comprises a plurality of arcuate panels which are interconnected in such a manner as to define a self supporting building structure without the need for trusses, columns or other supports. In this arrangement a plurality of building panels of channel shaped cross section are interconnected by crimping together the respective adjacent longitudinal flanges to form a permanent connection means. Whilst this arrangement is suitable for providing a self supporting structure, expensive equipment is required to form the necessary joins between the panels, and furthermore, the joins formed comprise permanent joins. Other proposals have required the use of separate fastening means to interconnect respective panels. This necessitates in many instances, the formation of holes in the building panels to accommodate the fasteners which not only is time consuming but can lead to water leakage in an erected building.

US-A-4109437 discloses an interlocking building panel which requires a supporting structure. The panels are fixed to the supporting structure by screws.

AU-B-451113 discloses an interlocking building panel which also requires a supporting structure. Adjacent panels are interconnected by 'rolling' the panels relative to one another.

The arrangement of AU-A-19798/67 also requires a supporting structure to which the panels are attached by screws.

The preceding three prior art documents essentially disclose cladding panels for structures rather than an interlocking arrangement capable of giving a self-supporting structure.

The present invention aims to overcome or alleviate at least some of the above disadvantages by providing an improved building panel which may be connected to adjacent similar building panels rapidly and efficiently to form a self supporting building structure. The present invention also relates to the method of interconnecting such building panels and to the building structure formed with panels of the above type.

With the foregoing and other objects in view this invention resides in a building panel as defined in claim 1 and in a method of constructing a wall or roof of a building comprising a plurality of such building panels as defined in claim 7. Further em-

bodiments of the building panel and of the method of constructing a wall or roof of a building comprising a plurality of such building panels are defined in claims 2 to 6 and claims 8 to 10 respectively.

In order that the invention may be more readily understood and put into practical effect, reference will now be made to the accompanying drawings which illustrate a preferred embodiment of the invention and wherein:-

Fig. 1 illustrates a self supporting building constructed in accordance with the present invention;

Fig. 2 illustrates in sectional view a building panel for forming the arcuate roof section of the building illustrated in Fig. 1;

Fig. 3 illustrates the connection between adjacent building panels of the type illustrated in Fig. 2;

Fig. 4 is an enlarged view illustrating the "snap-lock" connection between adjacent building panels;

Fig. 5 is a sectional view of an alternative form of building panel for forming the arcuate roof section of the building of Fig. 1;

Fig. 6 is a typical cross-sectional view of the panel along line A-A of Fig. 5;

Fig. 7 illustrates in perspective view, a preferred method and tool for interconnecting building panels formed in accordance with the present invention.

Referring to the drawings and firstly to Fig. 1, there is illustrated a building 10 constructed in accordance with the present invention comprising a self supporting arcuate roof section 11 and a pair of upstanding end walls 12 only one of which is illustrated. As shown, the arcuate roof section 11 comprises a plurality of interlocked roof panels 13 each of which is preferably of the profile illustrated in Fig. 2 and which includes a main body portion 14 and respective upstanding side portions 15 and 16. So that the roof panels 13 adopt the substantially longitudinal arcuate attitude shown in Fig. 1, the main body portion 14 is formed to have an arcuate cross section as shown in Fig. 2 whilst the side portions 15 and 16 at their lower ends are deformed outwardly as at 17 and 18 respectively to compensate for the longitudinal curvature of the body portion 14. Each upstanding side portion 15 and 16 includes a main flange portion 19 and 20 respectively, each adapted to be disposed and maintained in use in a juxtaposed attitude with the flange portions 19 or 20 of an adjacent panel 13 (see Fig. 3) so as to provide the assembled roof panels 13 with the required structural rigidity. The respective flange portions 19 and 20 are surmounted by respective male and female locking ribs 21 and 22 which extend to common sides of the respective flange portions 19 and 20 and which in

use are adapted to be engaged with one another to maintain respective panels 13 in operative engagement.

The upper ends of the flange portions 19 and 20 are also provided with respective complimentary shaped locating projections 23 and 24, the projection 23 defining a concave recess 25 of complimentary shape and size to the projection 24 so that when assembled the projection 24 on the flange portion 20 locates neatly in the concave recess 25 in the flange portion 19 so that the flange portions 19 and 20 may be located in position and in a juxtaposed attitude. This engagement also serves to prevent easy detachment of adjacent roof panels 13. As shown more clearly in Fig. 4, the male rib 21 is of generally inverted U-shaped form with one side flange 26 thereof extending in a generally vertical direction and with the free side flange 26' thereof inclined outwardly from the vertical, in this instance at an angle of approximately 30° thereto. The inclination of the flange 26' is achieved by means of an inward deformation 27 formed in the base of the U-shaped male rib 21. This provides for greater flexibility in the flange 26' to permit the flange 26' to be resiliently deflected inwardly to reduce the lateral dimensions of the rib 21 to facilitate its engagement with the female rib 22.

The female rib 22 is also of generally inverted U-shaped form and again one side flange 28 thereof extends generally vertically whilst the free side flange 28' thereof is slightly inclined to the vertical in this instance at an angle of approximately 15°. The flange 28' is provided adjacent its free end with an inwardly directed deformation 29 substantially aligned with the projection 24 and defining with the latter a restricted entrance into the interior of the female rib 22.

In use and when it is desired to interconnect respective panels 13, the panels 13 are positioned so that their respective longitudinal edges are adjacent to one another with the male and female ribs 21 and 22 respectively overlapping. A force is applied between the adjacent panels 13 in a direction generally parallel to the side portions 15 and 16 so that the adjacent panels 13 move relatively towards each other and so that the male rib 21 is forced through the restricted entrance of the female rib 22 and into the interior thereof. This is accomplished because the flange 26' of the male rib 21 will be resiliently deformed inwardly by virtue of the engagement of the opposite sides of the male rib 21 with the projections 24 and 29 to reduce the lateral dimensions of the rib 21 and at the same time engagement of the male rib 21 with the projections 24 and 29 of the female rib 22 will cause the flange 28' to be resiliently deflected outwardly thus increasing the lateral dimensions of the rib 22

and the width of the restricted entrance thereof to permit the male rib 21 to pass into the interior of female rib 22.

When the end of the flange 26 moves beyond the projection 29, it will resiliently deflect outwardly to "snap lock" the male rib 21 and female rib 22 together. At the same time, the projection 24 will locate in the recess 25 so that the flange portions 15 and 16 will be located in a juxtaposed relationship with the deformations 17 and 18 in abutment (see Fig. 3) and maintained in that relationship by virtue of the longitudinal arcuate configuration of the panels 13 and the interlocked male and female ribs 21 and 22. It will be seen from Fig. 4 that the flange 26' of the male rib 21 in its operative engaged attitude is in resilient abutment with the flange 28' of the female rib 22 thus maintaining the projection 24 in co-operative engagement with the recess 25 to lock the side portions 15 and 16 together. Furthermore, the flanges 26 and 28 are in face to face abutment and as the flange 26' is located behind the projection 29, detachment of the male and female rib will be resisted.

Fig. 5 illustrates an alternative arcuate roof panel 30 for the roof section 11 of the building structure shown in Fig. 1. In this instance, the main body portion 31 of the roof panel 30 and the upstanding side portions thereof 32 and 33 are transversely corrugated as at 34 in the manner shown in Fig. 6. The corrugations 34 form the main body portion 31 into a generally concave external configuration and the corrugations 34 also serve to increase the stiffness of the panels 30.

For the end walls 12 of the building, a plurality of substantially planar panels are provided, each of which are of a similar configuration to the arcuate panel 30 shown in Fig. 5 except that in this instance the main body portion of the panel is uncorrugated (as shown in dotted outline) and of substantially planar form as are the upstanding side flange portions so as to be in face to face abutment when engaged with adjacent planar flange portions.

In the construction of a self supporting building of the type illustrated in Fig. 1, planar panels of the above described type are initially formed preferably on site with mobile roll forming apparatus. To form the arcuate roof panels 13 for the roof section 11, the previously rolled panels are fed, on site, into deforming or corrugating apparatus to form the body portions thereof into the arcuate or trough shape shown in Fig. 2 or corrugations into the panel in the manner shown in Figs. 5 and 6. The so formed roof panels 13 or 30 are then interconnected preferably with a connection tool 35 and in the manner shown in Fig. 7. The tool 35 includes a first frame portion 36 supporting a pair of rollers 37 adapted for engagement with the upper surface of the female rib 22 and a second

frame portion 38 which supports a further pair of rollers 39 which locate in use within the interior of the male rib 21. The frame portions 36 and 38 are slidably interconnected to permit the rollers 37 and 39 to move towards or away from each other whilst actuating means 40 in the form of a threaded cranked member is threadably engaged with the frame portion 38 and abutted against the frame portion 36 so that the frame portions 36 and 38 and associated rollers can be moved towards each other. Preferably the frame portion 36 includes a U-shaped handle portion 41 to permit the tool 35 to be grasped and moved along the panel ribs.

In use a first panel 13 (or 30) is laid on the ground and a second panel 13 laid on the first panel 13 with the respective male and female ribs in alignment. The tool 35 is located at one end of the panels 13 and disposed relative to the ribs in the manner shown in Fig. 7. The cranked member 40 is then rotated to move the frame portions 36 and 38 and rollers 37 and 39 towards each other to force the male rib 21 into operative engagement with the female rib as shown in Fig. 4. The tool handle 41 is then grasped and the tool moved along the ribs to force the male rib 21 into the female rib 22 along the full length of the panels. This procedure may be repeated for each respective panel 13, however, preferably sets of three panels are interconnected on the ground as described above and then erected. The respective erected sets of panels 13 are then interconnected again by the use of the tool 35 and in this instance a cord or rope is attached to the handle 41 and passed to the other side of the building where it is grasped so that the tool 35 may be drawn along the panel ribs and over the roof to interconnect the panel sets.

The opposite ends of the erected panels may then be set into a concrete foundation 42 (see Fig. 1) or alternatively fixed by an alternative anchoring arrangement.

The end walls 12 may then be formed by interconnecting a plurality of planar panels. The lower ends of the interlocking planar panels may also be set into a concrete foundation 42, whilst at their upper ends the upstanding side portions of the planar panels are preferably cut away so that the projecting generally planar body portions may extend between the interlocked side portions 15 and 16 of adjacent arcuate panels so that the end walls are supported at their upper ends. Of course, door or wall cut-outs 43 may be formed in the end walls 12 where desired. Many other arrangements may be provided for supporting the upper ends of the walls such as by means of a channel section fixed to the underside of the arcuate roof panels 13 which locates the upper ends of the planar panels.

The male and female rib configurations of the

embodiment described above permit the panels to be interconnected by forces applied to the respective male and/or female ribs from one side of the panels only as by the tool 35. Alternatively, respective panels may be simply supported on one side and adjacent panels engaged therewith by applying a force say by body weight, to the overlapping panel to force the female rib over the male rib.

The present invention therefore provides an arrangement whereby panels may be simply interconnected to form a self supporting structure without the need for permanent interconnections such as fasteners or seams. In the configurations illustrated, the projections 23 and 24 may be eliminated if desired. Furthermore, many different configurations of male and female ribs may be employed for interconnecting the panels in lieu of the arrangement illustrated and described above. The above arrangements may also be applied to many different building structures other than that shown in Fig. 1.

Claims

1. A building panel (13) having in transverse cross-section a main body portion (14) and two side portions (15,16) extending upwardly from the respective opposite sides of the main body portion, each side portion including support flange means (19,20), the support flange means of one said side portion (16) terminating in a female rib (22) and the support flange means of the other said side portion (15) terminating in a male rib (21) adapted for inter-engagement with a female rib of a further panel whereby adjacent panels may be engaged in use, said female rib (22) extending wholly to one side of its support flange means and away from the main body portion (14) and said male rib (21) extending from its support flange means in the same direction as said female rib to permit adjacent panels to be overlapped in use and moved together to enable the male rib of one panel to engage the female rib of the adjacent panel, said female rib (22) being of generally inverted U-shape in transverse cross-section and having a first leg (28) comprising an extension of the adjacent support flange means (20) characterized in that said female rib (22) has a second leg (28) spaced from said first leg and having at its free end an inwardly directed first deformation (29), a second deformation (24) being provided in the region of the junction between said first leg (28) and the adjacent support flange means (20) arranged substantially opposite and extending towards said first deformation (29) to define with said first deformation a restricted

frame portion 38 which supports a further pair of rollers 39 which locate in use within the interior of the male rib 21. The frame portions 36 and 38 are slidably interconnected to permit the rollers 37 and 39 to move towards or away from each other whilst actuating means 40 in the form of a threaded cranked member is threadedly engaged with the frame portion 38 and abutted against the frame portion 36 so that the frame portions 36 and 38 and associated rollers can be moved towards each other. Preferably the frame portion 36 includes a U-shaped handle portion 41 to permit the tool 35 to be grasped and moved along the panel ribs.

In use a first panel 13 (or 30) is laid on the ground and a second panel 13 laid on the first panel 13 with the respective male and female ribs in alignment. The tool 35 is located at one end of the panels 13 and disposed relative to the ribs in the manner shown in Fig. 7. The cranked member 40 is then rotated to move the frame portions 36 and 38 and rollers 37 and 39 towards each other to force the male rib 21 into operative engagement with the female rib as shown in Fig. 4. The tool handle 41 is then grasped and the tool moved along the ribs to force the male rib 21 into the female rib 22 along the full length of the panels. This procedure may be repeated for each respective panel 13, however, preferably sets of three panels are interconnected on the ground as described above and then erected. The respective erected sets of panels 13 are then interconnected again by the use of the tool 35 and in this instance a cord or rope is attached to the handle 41 and passed to the other side of the building where it is grasped so that the tool 35 may be drawn along the panel ribs and over the roof to interconnect the panel sets.

The opposite ends of the erected panels may then be set into a concrete foundation 42 (see Fig. 1) or alternatively fixed by an alternative anchoring arrangement.

The end walls 12 may then be formed by interconnecting a plurality of planar panels. The lower ends of the interlocking planar panels may also be set into a concrete foundation 42, whilst at their upper ends the upstanding side portions of the planar panels are preferably cut away so that the projecting generally planar body portions may extend between the interlocked side portions 15 and 16 of adjacent arcuate panels so that the end walls are supported at their upper ends. Of course, door or wall cut-outs 43 may be formed in the end walls 12 where desired. Many other arrangements may be provided for supporting the upper ends of the walls such as by means of a channel section fixed to the underside of the arcuate roof panels 13 which locates the upper ends of the planar panels.

The male and female rib configurations of the

embodiment described above permit the panels to be interconnected by forces applied to the respective male and/or female ribs from one side of the panels only as by the tool 35. Alternatively, respective panels may be simply supported on one side and adjacent panels engaged therewith by applying a force say by body weight, to the overlapping panel to force the female rib over the male rib.

The present invention therefore provides an arrangement whereby panels may be simply interconnected to form a self supporting structure without the need for permanent interconnections such as fasteners or seams. In the configurations illustrated, the projections 23 and 24 may be eliminated if desired. Furthermore, many different configurations of male and female ribs may be employed for interconnecting the panels in lieu of the arrangement illustrated and described above. The above arrangements may also be applied to many different building structures other than that shown in Fig. 1.

Claims

1. A building panel (13) having in transverse cross-section a main body portion (14) and two side portions (15,16) extending upwardly from the respective opposite sides of the main body portion, each side portion including support flange means (19,20), the support flange means of one said side portion (16) terminating in a female rib (22) and the support flange means of the other said side portion (15) terminating in a male rib (21) adapted for inter-engagement with a female rib of a further panel whereby adjacent panels may be engaged in use, said female rib (22) extending wholly to one side of its support flange means and away from the main body portion (14) and said male rib (21) extending from its support flange means in the same direction as said female rib to permit adjacent panels to be overlapped in use and moved together to enable the male rib of one panel to engage the female rib of the adjacent panel, said female rib (22) being of generally inverted U-shape in transverse cross-section and having a first leg (28) comprising an extension of the adjacent support flange means (20) characterized in that said female rib (22) has a second leg (28) spaced from said first leg and having at its free end an inwardly directed first deformation (29), a second deformation (24) being provided in the region of the junction between said first leg (28) and the adjacent support flange means (20) arranged substantially opposite and extending towards said first deformation (29) to define with said first deformation a restricted



- entrance to the interior of said female rib, said male rib (21) being of generally inverted U-shape in transverse cross-section and including a first leg (26) comprising an extension of the adjacent support flange means (19) and a second leg (26) spaced from said first leg and inclined outwardly away from said first leg, an inwardly directed projection (23) defining a recess (25) being provided in the region of the junction between said first leg (26) and the adjacent support flange means (19), said recess (25) being complementary to said second deformation (24), the arrangement being such that in use said male rib (21) is located within said female rib (22), said first legs (26,28) of the male and female ribs being adjacent, said second leg (26) of the male rib resiliently engaging said second leg (28) of said female rib inwardly of said first deformation (29) and said second deformation (24) nesting within said recess (25) to interlock adjacent panels.
2. A building panel according to Claim 1, characterised in that said main body portion (14) and opposed support flange means (19,20) together form a generally U-shaped transverse cross sectional shape, said building panel being longitudinally arcuate.
 3. A building panel according to Claim 1 or Claim 2 characterised in that said main body portion (14) and said support flange means (19,20) are transversely corrugated.
 4. A building panel according to any preceding claim characterised in that said support flange means (19,20) adjacent their respective inner ends are deformed outwardly of the panel, the outward deformations (17,18) being in substantial abutment when adjacent panels are interlocked in use.
 5. A building including a wall comprising a plurality of interlocked building panels according to any one of claims 1-4.
 6. A building including a self supporting roof comprising a plurality of interlocked building panels according to any one of Claims 2 to 4.
 7. A method of constructing a wall or roof of a building comprising a plurality of building panels according to any of Claims 1-4, said method comprising the steps of:
 - (1) placing a first panel on a prepared base;
 - (2) placing a second panel adjacent said first panel with a respective female rib of one panel overlying a respective male rib of the other panel;
 - (3) aligning one free end of the second panel with an adjacent free end of the first panel;
 - (4) applying opposed forces to the adjacent male and female ribs of the panels to force the ribs into initial interlocking engagement;
 - (5) progressively moving longitudinally along the overlying ribs and applying opposed forces to force the male and female ribs into complete interlocking engagement;
 - (6) repeating steps (2) to (5) with further panel members to form a building of desired dimensions.
 8. A method according to claim 7 including the substitute steps of:
 - 4a) engaging opposed exposed surfaces of adjacent male and female ribs with rib engaging rollers (37,39); and
 - 4b) applying opposing forces to said rib engaging rollers (37,39) thereby to bring said male and female ribs into interlocking engagement.
 9. A method according to claim 8 including the intermediate step of:

adjusting the distance between said rib engaging rollers (37,39) thereby to initiate engagement of said male and female ribs.
 10. A method according to claim 9 including the intermediate step of:
 - 4c) engaging interlocked male and female members with guide rollers connected to said rib-engaging rollers to locate and guide said rib-engaging rollers longitudinally of said ribs.

Revendications

1. Panneau de bâtiment (13) ayant, en coupe transversale, une portion de corps principal (14) et deux portions latérales (15, 16) partant vers le haut de chacun des côtés opposés de la portion de corps principal, chaque portion latérale comprenant un bandeau support (19, 20), le bandeau support d'une portion latérale (16) se terminant par une nervure femelle (22) et le bandeau support de l'autre portion latérale (15) se terminant par une nervure mâle (21) adaptée pour coopérer avec la nervure femelle d'un autre panneau, ce qui permet, en utilisation, de solidariser l'un de l'autre des panneaux adjacents, la nervure femelle (22) s'étendant en totalité sur un côté de son bandeau support en s'éloignant de la portion de corps principal (14) et la nervure mâle (21)



partant de son bandeau support dans la même direction que la nervure femelle pour permettre, en utilisation, à des panneaux adjacents de se chevaucher et d'être déplacés ensemble pour permettre la coopération de la nervure mâle d'un panneau avec la nervure femelle du panneau adjacent, la nervure femelle (22) ayant, en coupe transversale, la forme générale d'un U inversé avec une première branche (28) constituée par un prolongement du bandeau support adjacent (20), caractérisé en ce que la nervure femelle (22) a une deuxième branche (28') espacée de la première branche et dont l'extrémité libre présente une première empreinte (29) dirigée vers l'intérieur, une deuxième empreinte (24) étant réalisée dans la région de la jonction entre la première branche (28) et le bandeau support (20) adjacent, cette deuxième empreinte étant pratiquement en vis-à-vis de la première empreinte (29) et s'étendant vers celle-ci de manière à définir avec la première empreinte une entrée restreinte dans l'intérieur de cette nervure femelle, la nervure mâle (21) ayant, en coupe transversale, la forme générale d'un U inversé avec une première branche (26) constituée par un prolongement du bandeau support (19) adjacent et par une deuxième branche (26') espacée de la première branche et inclinée vers l'extérieur en s'éloignant de la première branche, une saillie dirigée vers l'intérieur (23) définissant un évidement (25) étant réalisée dans la région de la jonction entre la première branche (26) et le bandeau support (19) adjacent, cet évidement (25) étant complémentaire de la deuxième empreinte (24), la disposition étant telle que, en utilisation, la nervure mâle (21) est disposée à l'intérieur de la nervure femelle (22), les premières branches (26, 28) des nervures, mâle et femelle, étant adjacentes l'une à l'autre, la deuxième branche (26') de la nervure mâle coopérant élastiquement avec la deuxième branche (28') de la nervure femelle à l'intérieur par rapport à la première empreinte (29) et la deuxième empreinte (24) se logeant à l'intérieur de l'évidement (25) pour verrouiller entre eux des panneaux adjacents.

2. Panneau de bâtiment selon la revendication 1, caractérisé en ce que la portion de corps principal (14) et les bandeaux supports opposés (19, 20) forment ensemble une section transversale sensiblement en forme de U, ce panneau de bâtiment étant longitudinalement incurvé.
3. Panneau de bâtiment selon l'une des revendications 1 ou 2, caractérisé en ce que la portion

de corps principal (14) et les bandeaux supports (19, 20) sont transversalement ondulés.

4. Panneau de bâtiment selon l'une des revendications précédentes, caractérisé en ce que, au voisinage de leurs extrémités intérieures respectives, les bandeaux supports (19, 20) sont déformés vers l'extérieur du panneau, ces déformations extérieures (17, 18) étant pratiquement en butée l'une sur l'autre lorsque des panneaux adjacents sont solidarisés l'un de l'autre en utilisation.
5. Bâtiment comportant un mur comprenant une multiplicité de panneaux selon l'une quelconque des revendications 1 à 4, solidarisés l'un de l'autre.
6. Bâtiment comportant un toit auto-porteur, comprenant une multiplicité de panneaux selon l'une quelconque des revendications 1 à 4, solidarisés l'un de l'autre.
7. Procédé pour construire un mur ou un toit d'un bâtiment comprenant une multiplicité de panneaux selon l'une des revendications 1 à 4, ce procédé comprenant les étapes suivantes :
 - 1) placer un premier panneau sur une base préparée ;
 - 2) placer un deuxième panneau adjacent au premier panneau avec une nervure femelle respective d'un panneau recouvrant une nervure mâle respective de l'autre panneau ;
 - 3) aligner une extrémité libre au deuxième panneau avec une extrémité libre adjacente du premier panneau ;
 - 4) exercer sur les nervures, mâle et femelle, adjacentes des panneaux des forces dirigées en sens inverse l'une de l'autre pour forcer les nervures en coopération de verrouillage initial ;
 - 5) déplacer progressivement longitudinalement le long des nervures se recouvrant et continuer à exercer des forces dirigées en sens inverse l'une de l'autre pour forcer les nervures, mâle et femelle, en coopération de verrouillage complet ;
 - 6) répéter les étapes 2) à 5) avec d'autres panneaux pour construire un bâtiment de dimensions désirées.
8. Procédé selon la revendication 7, comportant les étapes de remplacement suivantes :
 - 4a) amener en prise des surfaces découvertes opposées de nervures mâle et femelle, adjacentes avec des galets d'attaque de nervures (37, 39) ; et



4b) exercer sur ces galets (37, 39) des forces dirigées en sens inverse l'une de l'autre pour amener ces nervures, mâle et femelle, en coopération de verrouillage.

9. Procédé selon la revendication 8, comportant l'étape intermédiaire suivante :

réglér la distance entre les galets d'attaque de nervures (37, 39) pour amorcer la coopération des nervures, mâle et femelle.

10. Procédé selon la revendication 9, comportant l'étape intermédiaire suivante :

4c) faire coopérer les éléments, mâle et femelle, verrouillés entre eux avec des galets de guidage reliés aux galets d'attaque de nervures pour positionner et guider ces galets d'attaque de nervures longitudinalement sur ces nervures.

Patentansprüche

1. Gebäudesegment (13), das, im Querschnitt gesehen, einen Hauptschenkel (14) und zwei von den einander gegenüberliegenden Seiten des Hauptschenkels aufragende Seitenteile (15, 16) hat, die jeweils Stützwangen (19, 20) umfassen, wobei die Stützwange des einen Seitenteils (15) mit einer aufnehmenden Rippe (22) und die Stützwange des anderen Seitenteils (16) mit einer vorspringenden Rippe (21) endet, die derart gestaltet ist, daß sie mit einer aufnehmenden Rippe eines weiteren Segments in wechselseitigen Eingriff gebracht werden kann, wodurch einander benachbarte Segmente im Gebrauch zusammengefügt werden können, wobei weiter die aufnehmende Rippe (22) insgesamt auf einer Seite ihrer Stützwange und von dem Hauptschenkel (14) wegweisend angeordnet ist und die vorspringende Rippe (21) von ihrer Stützwange ausgehend in dieselbe Richtung wie die aufnehmende Rippe weist, so daß benachbarte Segmente im Gebrauch in Überlappung gebracht und zusammengeschoben werden können, derart, daß die vorspringende Rippe eines Segments in die aufnehmende Rippe des benachbarten Segments eingreifen kann und wobei die aufnehmende Rippe (22) im Querschnitt die Grundform eines invertierten U-Profiles hat und einen ersten Schenkel (28) aufweist, der eine Verlängerung der anschließenden Stützwange (20) bildet, dadurch gekennzeichnet, daß die aufnehmende Rippe (22) einen zweiten Schenkel (28') hat, der in einem Abstand von dem ersten Schenkel angeordnet ist und an seinem freien Ende eine einwärts gerichtete, erste Einbuchtung

(29) aufweist, daß im Anschlußbereich zwischen dem ersten Schenkel und der benachbarten Stützwange (20) eine zweite Einbuchtung (24) vorgesehen ist, die im wesentlichen der ersten Einbuchtung (29) gegenüberliegend und auf diese hinzu sich erstreckend angeordnet ist, um zusammen mit der ersten Einbuchtung (29) eine verengte Zugangsöffnung zum Inneren der aufnehmenden Rippe zu bilden, daß die vorspringende Rippe (21) im Querschnitt die Grundform eines invertierten U-Profiles hat und einen ersten Schenkel (26) aufweist, der eine Verlängerung der anschließenden Stützwange (19) bildet, sowie einen zweiten Schenkel (26') hat, der in einem Abstand von dem ersten Schenkel angeordnet ist und von dem ersten Schenkel weg nach außen geneigt verläuft, daß im Anschlußbereich zwischen dem ersten Schenkel (26) und der benachbarten Stützwange (19) ein nach innen gerichteter Vorsprung (23) vorhanden ist, der eine Einschnürung (25) bildet, die komplementär zu der zweiten Einbuchtung (24) ist, und daß die Anordnung derart getroffen ist, daß in der Gebrauchslage die vorspringende Rippe (21) innerhalb der aufnehmenden Rippe (22) angeordnet ist, die ersten Schenkel (26, 28) der vorspringenden und der aufnehmenden Rippe aneinander anliegen, der zweite Schenkel (26') der vorspringenden Rippe, unter elastischer Vorspannung stehend, innerhalb der ersten Einbuchtung (29) mit dem zweiten Schenkel (28') der aufnehmenden Rippe in Eingriff steht und die zweite Einbuchtung (24) mit der Einschnürung (25) in formschlüssigem Eingriff steht, um einander benachbarte Segmente durch wechselseitigen Eingriff fest miteinander zu verbinden.

2. Gebäudesegment nach Anspruch 1, dadurch gekennzeichnet, daß der Hauptschenkel (14) und einander gegenüberliegend angeordnete Stützwangen (19, 20) zusammen eine der Grundform nach U-förmige Querschnittsform ergeben, und daß das Gebäudesegment in seiner Längsrichtung bogenförmig gekrümmt ausgebildet ist.
3. Gebäudesegment nach Anspruch 1 oder Anspruch 2, dadurch gekennzeichnet, daß der Hauptschenkel (14) und die Stützwangen (19, 20) mit einer Querriffelung versehen sind.
4. Gebäudesegment nach einem der vorhergehenden Ansprüche, dadurch gekennzeichnet, daß die Stützwangen (19, 20) ihren jeweiligen inneren Enden be-



- nachbart vom Segment aus nach außen weisende Vorsprünge (17, 18) haben, und daß diese nach außen gerichteter Vorsprünge fest in Anlage miteinander gehalten sind, wenn benachbarte Segment in ihrer Gebrauchslage wechselseitig aneinander verankert sind.
5. Gebäude mit einer Wand, die aus wechselseitig fest miteinander verbundenen Segmenten nach einem der Ansprüche 1 bis 4 besteht.
6. Gebäude mit einem selbsttragenden Dach, das aus mehreren wechselseitig fest aneinander verankerten Gebäudesegmenten nach einem der Ansprüche 2 bis 4 besteht.
7. Verfahren zur Erstellung einer Wand oder eines Daches eines Gebäudes aus einer Mehrzahl von Gebäudesegmenten nach einem der Ansprüche 1 bis 4, gekennzeichnet durch die folgenden Verfahrensschritte:
- (1) Anordnung eines ersten Segments auf einer vorbereiteten Auflage;
 - (2) Anordnung eines weiteren Segments, am ersten anliegend, derart, daß jeweils die, aufnehmende Rippe eines Segments und die vorspringende Rippe des anderen Segments übereinander liegen;
 - (3) Ausrichtung eines freien Endes des zweiten Segments mit dem benachbarten freien Ende des ersten Segments;
 - (4) Ausübung einander entgegengesetzt gerichteter Kräfte auf die aneinander anliegenden vorspringenden und aufnehmenden Rippen der Segmente, um die Rippen in wechselseitigen formschlüssigen Eingriff miteinander zu drücken;
 - (5) entlang den übereinander liegenden Rippen in deren Längsrichtung fortschreitend Ausübung aufeinander zugerichteter Kräfte, um die vorspringenden und die aufnehmenden Rippen vollständig in formschlüssigen Eingriff miteinander zu drücken;
 - (6) Wiederholung der Verfahrensschritte (2) bis (5) mit weiteren Segmenten zum Aufbau eines Gebäudes mit vorgegebenen Dimensionen.
8. Verfahren nach Anspruch 7, gekennzeichnet durch Substitution des Verfahrensschrittes (4) durch die folgenden Verfahrensschritte:
- (4a) Ansetzen von an den Rippen angreifenden Rollen (37, 39) an einander gegenüberliegenden Außenflächen der vorspringenden und der aufnehmenden Rippen; und
 - (4b) Ausübung entgegengesetzt gerichteter Kräfte auf die an den Rippen angreifenden Rollen (37, 39), um dadurch die vorspringenden und die aufnehmenden Rippen in formschlüssig verankerten Eingriff miteinander zu bringen.
9. Verfahren nach Anspruch 8, gekennzeichnet durch den Zwischenschritt:
- Einstellung des Abstandes der an den Rippen sich abstützenden Rollen (37, 39), um dadurch den Rast-Eingriff der vorspringenden und der aufnehmenden Rippen einzuleiten.
10. Verfahren nach Anspruch 9, gekennzeichnet durch den weiteren Zwischenschritt, daß
- (4c) miteinander verrastete vorspringende und aufnehmende Glieder mit Führungsrollen in Wirkverbindung gebracht werden, die mit den in die Rippen eingreifenden Rollen verbunden sind, um diese exakt zu positionieren und in Längsrichtung der Rippen zu führen.

