



(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
27.05.1998 Bulletin 1998/22

(51) Int. Cl.⁶: **E04G 25/00**, E06B 1/60

(21) Application number: 97610053.7

(22) Date of filing: 21.11.1997

(84) Designated Contracting States:
**AT BE CH DE DK ES FI FR GB GR IE IT LI LU MC
NL PT SE**
Designated Extension States:
AL LT LV MK RO SI

(72) Inventors:
• **Lundsdaal, Carsten**
3300 Frederiksvaerk (DK)
• **Larsen, Erik Lokke**
3300 Frederiksvaerk (DK)

(30) Priority: 21.11.1996 DK 133296

(74) Representative:
Wittrup, Flemming et al
c/o Hofman-Bang & Boutard, Lehmann & Ree
A/S,
Hans Bekkevolds Allé 7
2900 Hellerup (DK)

(71) Applicant: **Knudsen Kilen A/S**
3300 Frederiksvaerk (DK)

(54) **A wedge**

(57) The invention relates to a wedge comprising an annular peripheral wall (1) wherein partition walls (2,3) are provided between respective sides of the peripheral wall, said partition walls (2,3) dividing the space within the peripheral wall into mutually separated compartments (6,7,8), wherein a number of the compartments have a delimiting surface (4) at the peripheral edge of the partition walls (2,3) and optionally portions of the adjacent peripheral wall (1), said delimiting surface (4)

servicing, at the surface thereof facing away from the respective compartment, as a support surface for an object arranged on the wedge, wherein the wedge is characterised in that at least a portion of the remaining, delimited compartments between the partition walls (2,3) and optionally portions of the adjacent peripheral wall (1) are provided with a delimitation (5) at a distance from the respective peripheral edges of said walls.

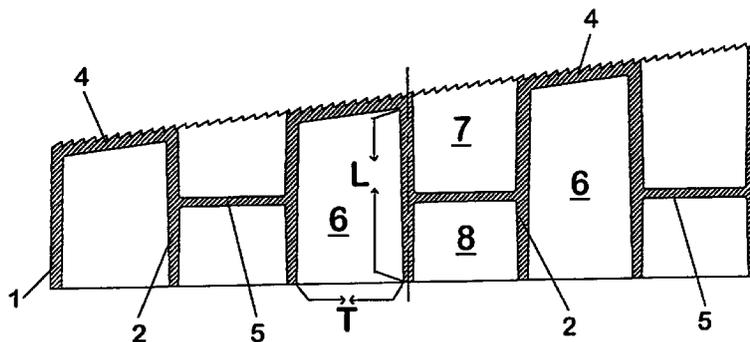


FIG. 2

Description

The invention relates to a wedge comprising an annular peripheral wall, wherein partition walls are provided between respective sides of the peripheral wall, said partition walls dividing the space within the annular peripheral wall into mutually separate compartments, wherein a number of the compartments are provided with a delimiting surface at a peripheral edge of the partition walls and optionally at portions of the adjacent peripheral wall, the surface of said delimiting face that faces away from the respective compartment serving as a support for an object positioned on said wedge.

Such wedges are well known and widely used within the construction industry, where there is a need for supporting and adjusting the length of building elements, such as floorings and windows in connection with building.

DK patent No. 141414 teaches a wedge of the type described above. This prior art wedge is at both wedge surfaces provided with abutment surfaces for a support or a superposed wedge with a corresponding abutment surface. The wedge is manufactured in an injection moulding process.

In use, two wedges are employed that are shifted relative to each other, whereby planar support is achieved which is parallel relative to the support. In case the required supporting height exceeds the height obtainable with two wedges, it is necessary either to use more wedges or to establish a support for the wedge pair, e.g. by using wooden blocks or the like. Such stacking of a plurality of wedges or positioning of a support element are considerably more troublesome than the establishment itself of the support by means of two wedges. Moreover, a support established in this manner is substantially less stable than a support formed of two wedge elements.

It is consequently desired to have a wedge at one's disposal whose height exceeds that of the prior art wedge.

The delimiting surfaces of the wedge described above according to DK 141414 are found in all the compartments delimited by the peripheral wall and the partition walls at the peripheral peripheries of said walls, and thus they serve as abutment surfaces. This prior art construction will thus be unsuitable for the manufacture of a wedge with a substantially increased height relative to its length and width, since there is a risk that the wedge may be distorted during the cooling that follows the injection moulding process, and may following cooling appear as a lopsided or distorted wedge. This is undesirable.

It is therefore the object of the present invention to provide a wedge construction of the kind described in the introductory part which ensures that the peripheral dimensions of such wedge are substantially maintained while simultaneously providing the straightest possible wedge and optimising the material consumption.

According to the invention this is accomplished by providing a delimiting element at least in a number of the remaining delimiting compartments between the partition walls, and optionally portions of the adjacent peripheral wall, at a distance from the respective peripheral peripheries of said walls.

The delimitations between the walls in the respective, delimited compartments being provided at a distance from the peripheral peripheries of the respective compartment-delimiting walls, it is possible, by injection moulding of such wedge, to form these walls with a tolerance of the thickness which is relatively small compared to the desired strength. In connection with the injection moulding of such objects, there is, as mentioned above, a considerable risk that the ready-moulded object will be distorted during the cooling process following discharge from the mould whereby a lopsided and in most cases useless object is obtained. In the construction of the wedge according to the invention, the risk of the finished wedge distorting during the cooling process is considerably reduced, and thus it is possible to form a high wedge at a substantially reduced production flow rate compared to a wedge structure like the one described above in connection with the prior art.

Moreover the cores used in the injection moulding for the formation of the respective cavities are, depending on their longitudinal extent, able to distort sideways and thus, in case two cores are distorted in directions towards each other, the formation of an interjacent wall of a reduced wall thickness will result. Obviously, the strength of the wedge is hereby diminished, and therefore it is necessary to take this into account when dimensioning the wedge and during the subsequent determination of the wall thickness. The present invention necessitates only that an elongate core be used in those compartments where a support surface is to be generated at a peripheral edge. In neighbouring compartments two short cores are used, one at each side of the desired delimitation, whereby the distortion of each of these is reduced. Thus the present invention provides a wedge that consumes less material relative its desired minimum strength and which may be manufactured with a substantial height.

Furthermore, an elongate core is easier broken than a short core and the wedge construction according to the invention involves a reduced risk of operation shutdowns, since the number of cores of increased length has been reduced.

According to a convenient embodiment, the wedge is so configured that the support surface of the wedge that faces towards another wedge during use is provided with a profile in the shape of teeth that extend transversally to the longitudinal direction of the wedge. Preferably three longitudinal rows of teeth are provided, the middle row being displaced relative to the remaining, adjacently positioned rows of teeth, preferably by the width of half a tooth.

According to a preferred embodiment, the wedge is

so configured that the compartments in the wedge that are delimited by the peripheral wall and the delimiting walls have a minimum cross sectional dimension that constitutes at least 15 percent of the length of the same compartment. This construction further reduces the risk of the elongate cores breaking, and the risk of operation shutdowns is further reduced.

According to a preferred embodiment the wedge is so configured that each delimitation in the area that abuts on a partition wall or a peripheral wall has a reduced material thickness compared to the central portion of the delimitation. This may be realised e.g. by each delimitation being chamfered in a direction towards the connecting area by a partition wall or a peripheral wall. Hereby it is possible to accomplish delimitations with a relatively large material thickness in order to hereby ensure a considerably improved nailability, i.e. the option of nailing the wedge to a support without suctions occurring in surfaces of the wedge as a consequence of the relatively large material thickness, hereby ensuring a planar side of the wedge.

A preferred embodiment of the wedge according to the invention will be described in the following with reference to the drawings, wherein

Figure 1 is a top plan view of the wedge,

Figure 2 is a vertical, sectional view through the wedge shown in Figure 1 along the line A-A,

Figure 3 is a bottom view of the wedge,

Figure 4 is a top plan view of the wedge shown in Figure 1, in a modified embodiment,

Figure 5 is a vertical, sectional view through the wedge shown in Figure 4 along the line B-B, and

Figure 6 is a bottom view of the wedge shown in Figure 4.

As will appear from Figures 1 through 3 the wedge comprises an annular peripheral wall 1. Between opposed portions of the peripheral wall 1, transversal and longitudinal, 2 and 3 respectively, partition walls are provided in such a manner that in combination with the annular peripheral wall, they delimit areas 6,7,8 within the peripheral wall. At a peripheral, upwardly facing edge of partition walls and peripheral walls, a series of the delimited compartments are provided with a delimitation 4 that serve as support surface 4 during use for a further, complementary wedge which may be a usual, known wedge of a smaller height. These support surfaces 4 are provided with a chessboard-like pattern. Between these compartments having support surface delimitations, remaining compartments are provided, each having a delimitation situated at a distance from the respective peripheral edges of the partition walls

and peripheral wall.

In the longitudinal direction of the wedge thus exemplified, the wedge has to rows of cavities and support surfaces, respectively, since a longitudinal partition wall 3 is exclusively provided between opposite sides of the peripheral wall. Thus, the compartments or cavities in question have a relatively large transversal dimension T compared to their lengths in order to hereby be able to allow use of correspondingly thick cores in the injection moulding tool and hereby minimise the risk of the cores breaking with ensuing operation shut-downs.

It will also appear that on the top surface a serrated profile is provided with teeth in three rows 9,10,11, wherein the middle row of teeth 10 is displaced by the width of half a tooth relative to the remaining two rows of teeth 9,11 in order to hereby prevent that a superposed wedge with a corresponding profile may be shifted sideways.

Between the peripheral wall 1 and the partition walls 2,3 arranged between the respective sides thereof, the compartments, which do not at their ends comprise delimitations serving as abutment surfaces, have delimitations arranged at a distance from the peripheral edges of these peripheral wall and partition wall portions.

These delimitations or transversal walls are positioned like this in order to counteract lopsidedness or distortion of the finished product during the cooling process which is otherwise very likely to occur.

In all compartments, the delimitations 5 are provided at the same distance from that of the two peripheral edges of the peripheral wall and partition walls which is opposite the peripheral edge, where the remaining compartments are provided with delimitations 4 serving as abutment surfaces. Hereby it is possible to use the tool portion used in this area in the production of other wedges, optionally with an increased or reduced height, wherein it is also required that the delimitation is situated at a distance from the peripheral edge.

Figures 4-6 illustrate a modified embodiment of the wedge shown in Figure 1-3 wherein the wedge is so configured that each delimitation 5 in the area 12 that is adjacent to a partition wall or peripheral wall is has a reduced material thickness compared to the central portion of the delimitation, each delimitation being chamfered 12 in a direction towards the connecting area with a partition wall or a peripheral wall. Hereby it is possible to provide delimitations with a relatively increased material thickness in order to hereby ensure a considerably improved nailability, i.e. the option of nailing the wedge to a support without an ensuing risk of the wedge being damaged, and without suctions occurring in surfaces of the wedge due to the relatively increased material thickness.

Claims

1. A wedge comprising an annular peripheral wall (1) wherein partition walls (2,3) are provided between respective sides of the peripheral wall, said partition walls dividing the space within the peripheral wall (1) into mutually separated compartments (6,7,8), wherein a number of the compartments are, at a peripheral edge of the partition walls and optionally portions of the adjacent peripheral wall, provided with a delimiting surface (4) serving, at the surface facing away from the respective compartment, as an abutment surface for an object arranged on the wedge, **characterized** in that at least a number of the remaining, delimited compartments between the partition walls (2,3) and optionally portions of the adjacent peripheral wall (1) are provided with a delimitation (5) at such distance from the respective peripheral edges of these walls that the rigidity thereof will, to the highest degree possible, absorb the material forces occurring as a result of the cooling process.

5
10
15
20
2. A wedge according to claim 1, **characterized** in that in the situation of use of the wedge, the support surface of the wedge that faces towards another wedge is provided with a profile in the form of teeth (9,10,11) that extend transversally to the longitudinal direction of the wedge.

25
30
3. A wedge according to claim 2, **characterized** in that three longitudinal rows of teeth (9,10,11) are provided, wherein the middle row (10) is displaced relative to the remaining, adjacently situated rows of teeth (9,11), preferably by the width of half a tooth.

35
4. A wedge according to any one of claims 1-3, **characterized** in that the compartments (6,7,8) in the wedge that are delimited by the peripheral wall and the partition walls have a minimum transversal dimension (T) that constitutes at least 15 percent of the length (L) of the same compartment.

40
5. A wedge according to any one of claims 1 through 4, **characterized** in that each delimitation in the area (12) that abuts on a partition wall or a peripheral wall is has a material thickness which is reduced compared to the that of the central portion of the delimitation.

45
50
6. A wedge according to claim 5, **characterized** in that each delimitation is chamfered (12) in a direction towards the connecting area by a partition wall or a peripheral wall.

55

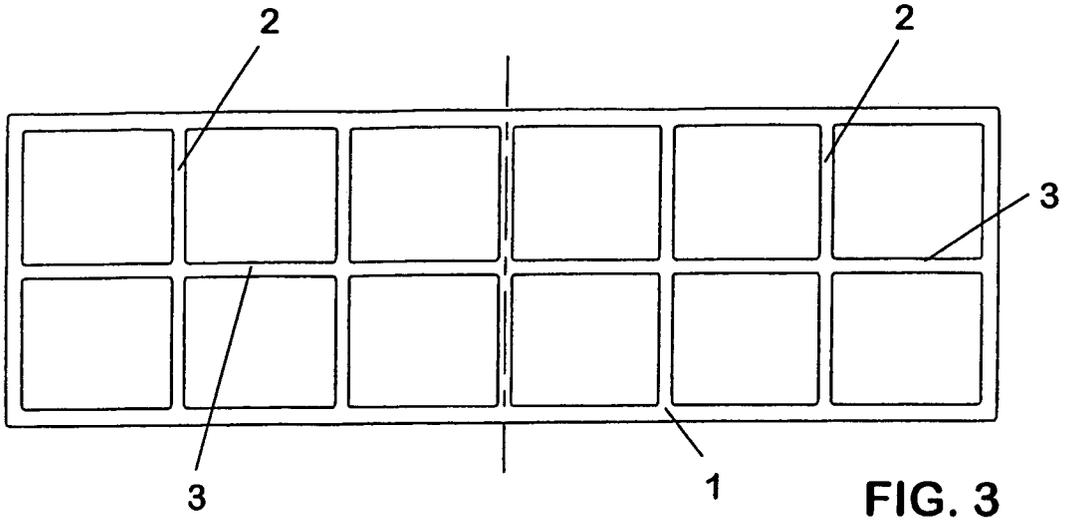


FIG. 3

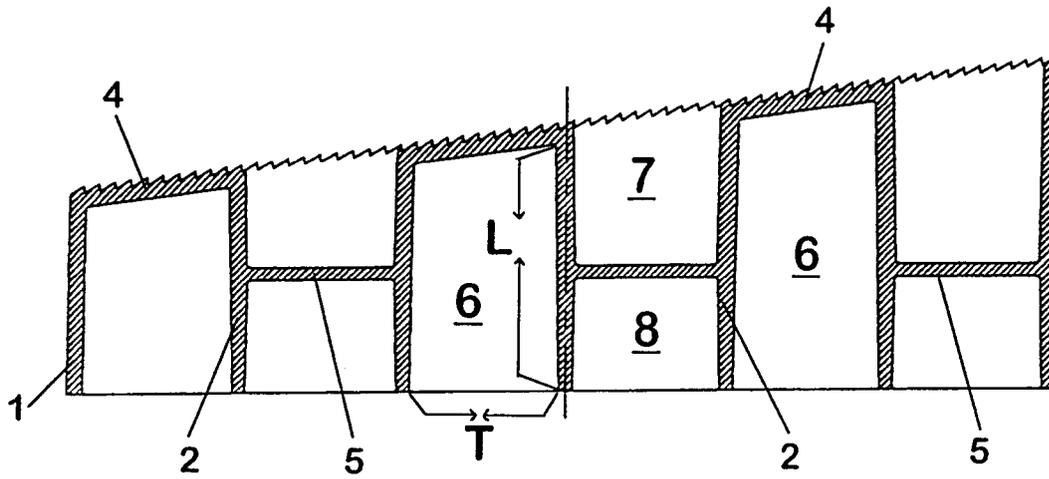


FIG. 2

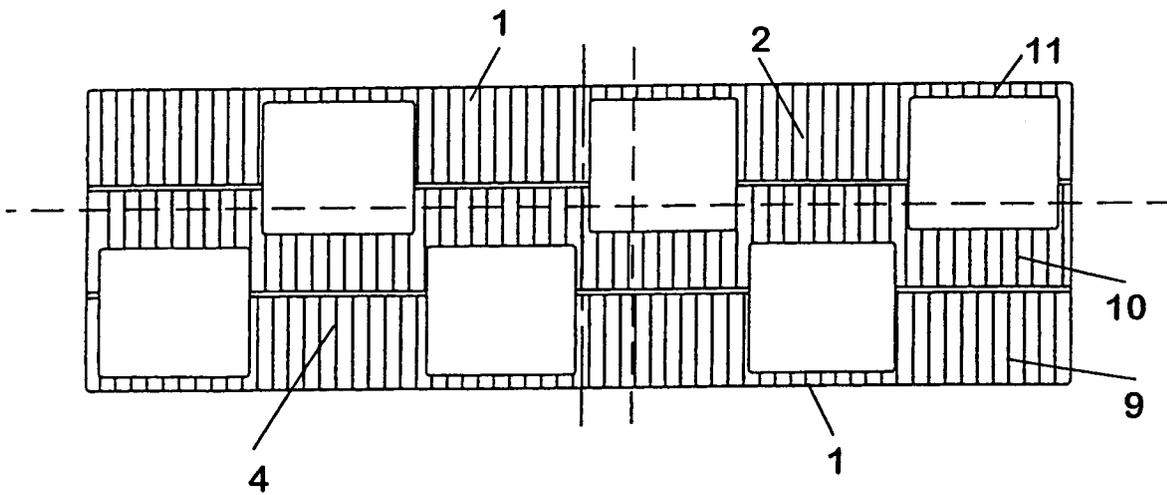
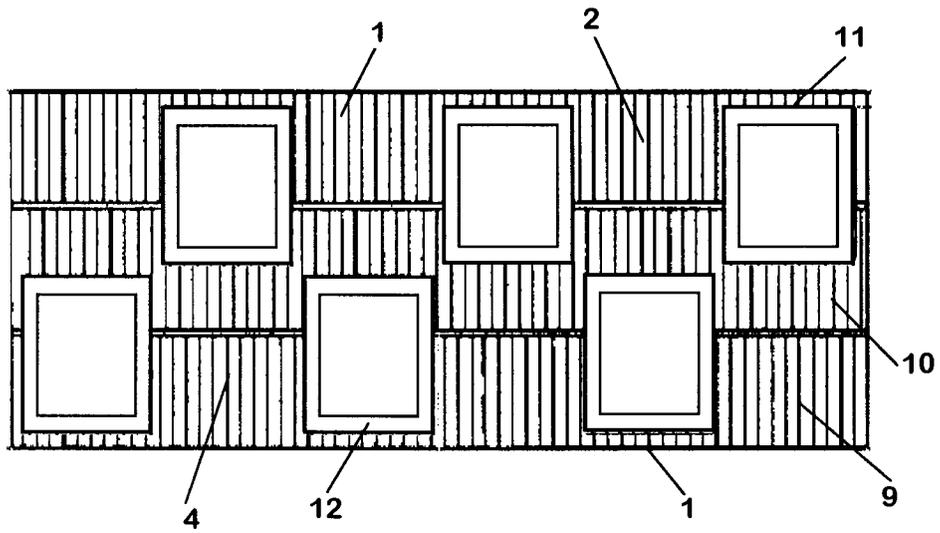
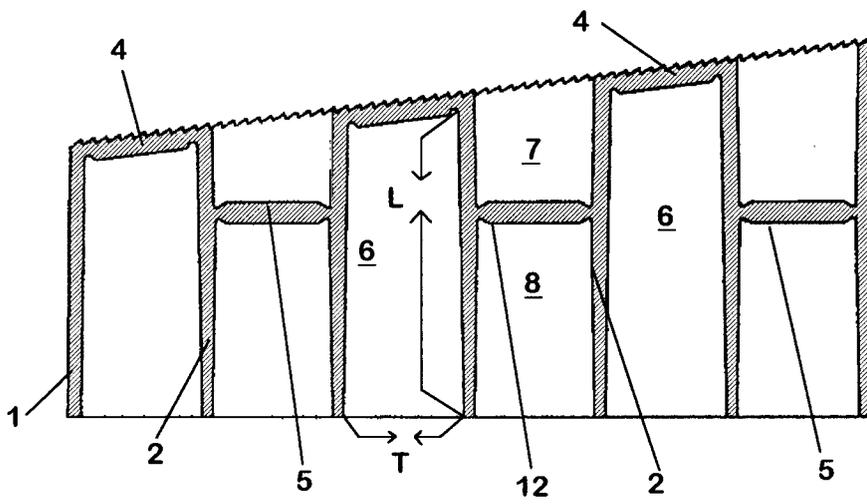
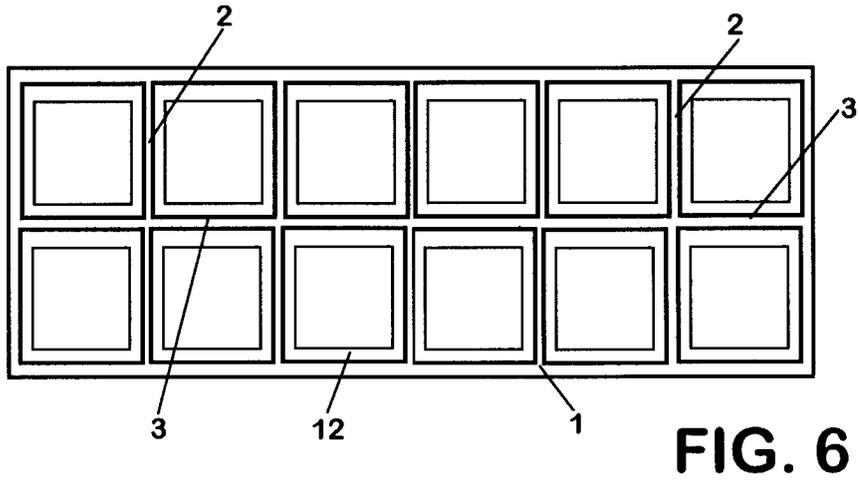


FIG. 1





European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 97 61 0053

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
D,A	DK 141 414 A (KNUDSEN PLAST) -----		E04G25/00 E06B1/60
			TECHNICAL FIELDS SEARCHED (Int.Cl.6)
			E04G E06B F16B F16M
The present search report has been drawn up for all claims			
Place of search	Date of completion of the search	Examiner	
THE HAGUE	11 February 1998	Vijverman, W	
CATEGORY OF CITED DOCUMENTS		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document			

EPO FORM 1503 03 82 (P04C01)