

(19) **DANMARK**

(10)

DK 181205 B1



(12)

PATENTSKRIFT

Patent- og
Varemærkestyrelsen

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- (51) Int.Cl.: ***E06B 1/60 (2006.01)*** ***F16B 2/14 (2006.01)***
- (21) Ansøgningsnummer: **PA 2021 00912**
- (22) Indleveringsdato: **2021-09-27**
- (24) Løbedag: **2021-09-27**
- (41) Alm. tilgængelig: **2023-03-28**
- (45) Patentets meddelelse bkg. og publiceret den: **2023-04-27**
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- (54) Titel: **Kile, kilesystem og fremgangsmåde til opklodsning af byggeelementer**
- (56) Fremdragne publikationer:
US 8813437 B1
US 2006/0022180 A1
DE 202016003416 U1
- (57) Sammendrag:
The invention relates to a shim, a shim system and a method for blocking up building elements. The shim comprises an elongated connecting element at a first surface. The elongated connecting element has a first connecting end connected to a main part of the shim, at a first end, and further comprises a second free end, arranged towards a second end of the main part. The shim further comprises an opening at a first surface, such that a second substantially identical shim can be connected to the shim with the first surfaces towards each other, by the free ends of each elongated connecting element extending into the opening of the other shim.

Fortsættes...

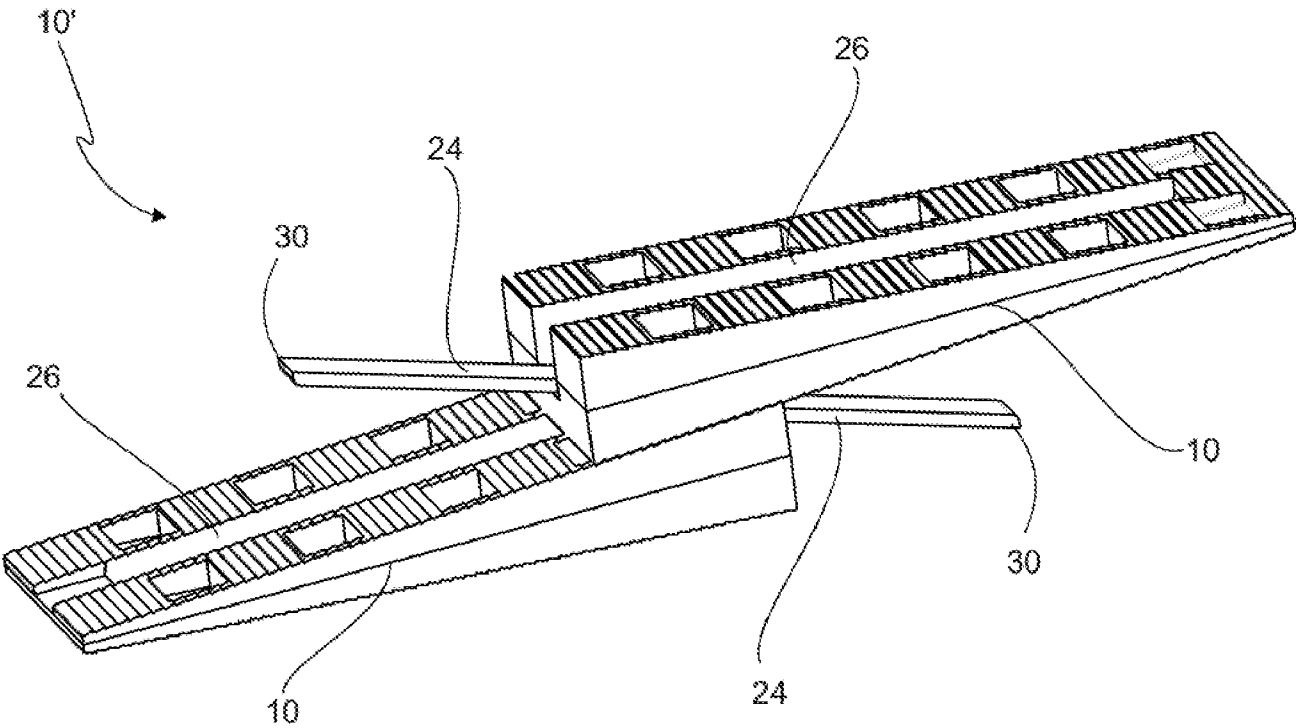


FIG. 2

TECHNICAL FIELD

The present invention relates to a shim element, a shim system and a method for
5 blocking up building elements.

BACKGROUND OF THE INVENTION

The technique of blocking-up building elements, such as floors, windows, doors, or
elements such as machinery, which has to be in level, by using two opposed wedges
10 arranged on top of each other is well known.

The technique involves a number of similar, wedge-shaped shims comprising a top
and bottom surface provided with a friction surface, comprising rows of teeth (as dis-
closed in EP 0 844 344 A1) for creating a friction in the longitudinal direction of the
wedge-shaped shim.

15 Such wedge-shaped shims are simple to manufacture and simple to use, and provide
good results for avoiding slippage between the shim and another element, such as a
construction element of another shim, in the longitudinal direction of the shim and per-
pendicular to the rows of teeth.

However, when using two of such wedge-shaped shims on top of each other, the two
20 shims may be difficult to align with each other, and when misaligned or even perfectly
aligned, tend to slip or move in relation to each other, such that the two shims move in
relation to each other in a sideways direction of the shims. Hereby, the blocked-up
building elements or machinery may become unstable.

Further, due to the possible sideways movement, the positioning of the individual
25 shims is difficult for the person installing the shims, as care must be taken for position-
ing the shims correctly in relation to each other and also in relation to the building ele-
ment or machinery.

Examples of shim systems avoiding the above-described problem are disclosed in EP
30 2 078 800 B1 or GB 2404388 A. The documents disclose a system comprising two
wedges, which are aligned and mutually correctly positioned by providing the wedges
with a flange at one end of the wedge of a system having longitudinal ridges/grooves
arranged at the top and bottom surface for engagement with a corresponding wedge.

35 These known systems however comprise a complicated construction and are not suit-
able to be used both in the system and as individual wedge elements.

Another example of a shim is disclosed in US 8813437 B1. This document discloses a shim system where the top shim has a connecting part that can be connected to the bottom part in order to control the overlap and thus the height of the shim system. The system discloses an arrangement having two differently constructed shim parts arranged connectably to each other. The arrangement is however rather complicated and due to the construction only gives a limited degree of adjustment. The claimed invention thus differs from D1 by the characterising features of claim 1.

It is an object of the present invention to provide a simple and effective shim and a shim system where the individual shims are easy to manufacture, easy to use in operation as a system having at least two shims, where transverse unintentional displacement between the two shims is avoided, and where the shim is still optimal to use as a single shim.

The above object and advantages, together with numerous other objects and advantages, which will be evident from the description of the present invention, are according to a first aspect of the present invention obtained by:

A shim for blocking up building elements, such as floors or windows/doors, where the shim comprises a main part having a first surface and a second surface, a first and second end, and first and second sides, wherein the shim comprises an elongated connecting element at the first surface, the elongated connecting element having a first connecting end connected to the main part at the first end, and a second free end arranged towards the second end of the main part, and wherein the shim comprises an opening at the first surface, such that a second substantially identical shim can be connected to the shim with the first surfaces towards each other, by the free ends of each elongated connecting element extending into the opening of the other shim.

The shim is preferable a wedge-shaped shim which is manufactured by known techniques, such as being injection molded from a plastic material such as polyethylene (PE). The shim may be manufactured from other suitable materials known to the skilled person.

The shim comprises a first surface and a second surface which are arranged with a mutual, oblique angle defining the wedge-shape. The angle between the first and second surface may vary depending on the actual needs of the shim. Further, the shim

may also be manufactured with different dimensions, such as different heights. In one embodiment, the shim may have a narrow pointy end and a broad opposite end, or in another embodiment the shim may be manufactured as a blunt wedge, where the narrow end of the wedge is blunt, and the broad end is arranged with a higher dimension.

- 5 Hereby is it possible to arrange a number of differently dimensioned wedge-shaped shims which may be used together depending on the needs.

Alternatively, the shim may be manufactured by the same known processes but have first and second surfaces which are parallel.

- 10 Preferably, the shim comprises a surface pattern for creating a friction surface on the first and/or second surface of the main part. The surface pattern may be arranged as rows of teeth for creating friction in the direction between the first and second end. Alternatively, the surface pattern may be arranged as staggered rows of projections for creating a friction in the direction between the first and second end and in the direction
15 between the first and second side.

According to a further embodiment of the first aspect of the invention, the elongated connecting element is connected to said main part at an edge of said opening.

- 20 The elongated connecting element, which is part of the shim, is preferably connected to the main part of the shim at an edge of the opening. The elongated connecting element is preferable connected at the edge of the opening, within the opening, such that the junction between the elongated connecting element at the main part are located below the first surface, i.e., in the opening between the first surface and the second
25 surface. It is hereby possible to use the shim as a single-type shim and to use the shim in a shim system comprising two or more individual shims. When using the shim as a single shim, it is necessary that the elongated connecting element does not project from the first surface, hereby interfering with the connection between the shim and the blocked-up element.

30

According to a further embodiment of the first aspect of the invention, the elongated connecting element is flexible, such that the elongated connecting element may be forced out of a neutral start position and bias back into the neutral start position.

- 35 However, due to the arrangement of the flexible elongated connecting element and the opening, where the elongated connecting element projects from the first surface of the

shim, it is possible to force the elongated connecting element into the opening, such that it does not project from the first surface. This has the advantage that the shim may be used as a common-type single shim. The shim is preferably manufactured from a plastic, such as PU, such that the material in itself provides some flexibility.

- 5 Where the material provides the flexibility, it is preferred that the connecting element is arranged with a width which is larger than the thickness, such that the connecting element may bend out of the opening but not in the transverse direction.

- According to a further embodiment of the first aspect of the invention, the elongated
10 connecting element comprises a weakening at the connecting end, the weakening acting as a hinge, such that the elongated connecting element may be forced out of a neutral start position and bias back into the neutral start position.

- The shim may however alternatively or additionally also be arranged such that the
15 elongated connecting element comprises a weakening, which increases or provides the flexibility of the elongated connecting element in the direction through the opening, but not in the transverse direction of the shim. The elongated connecting element may hereby more easily be bend into and/or out of the opening. The connecting element may thus be arranged from a flexible material which provides the desired flexibility, but
20 remains substantially stiff in the transverse direction.

Where the weakening provides the necessary flexibility, the shape of the elongated element is not crucial.

- 25 According to a further embodiment of the first aspect of the invention, the first and second sides are longitudinal sides defining a length of the shim, the elongated connecting element having a length spanning the majority of the length of the shim.

- A shim where the elongated connecting element has a length which spans the majority
30 of the shim has the effect that the degree of adjustment between two similar interconnected shims is relatively large and the elongated connecting elements still give the necessary locking effect in the transverse direction. The elongated connecting element may however be shorter if a smaller degree of adjustment is needed.

According to a further embodiment of the first aspect of the invention, the first and second surfaces are arranged at an angle in relation to each other, hereby forming a wedge.

- 5 The shim preferably has a wedge shape, such that two interconnected shims, when connected and displaced in relation to each other, give the necessary variation in height of the two shims.

According to a further embodiment of the first aspect of the invention, the elongated
10 connecting element is integrated with the main part.

The elongated connecting element is preferably integrated with the main part, such as manufactured from the same material, e.g., extruded from PU as a single element. In case the functionality of the elongated connecting element is not needed, the connect-
15 ing element may simply be cut off by a suitable tool, and the shim has only the function of a standard shim, known with technical field.

Alternatively, the elongated connecting element may be part of the shim, as an independent element, which is releasably connected to the wedge at the first end. The
20 wedge and the elongated connecting element may therefore comprise releasable coupling elements, such as a releasable joint.

According to a further embodiment of the first aspect of the invention, the elongated connection element is arranged at an oblique angle in relation to said first surface.
25

Arranging the elongated connecting element at an oblique angle in relation to the first surface creates the possibility of interconnecting two shims by sliding the shims towards and over each other, instead of arranging them on top of each other before connecting. The connection between the two shims remains during the slidable displacement of the two shims. When two shims are connected and displaced to a maximum
30 height, the connecting ends of the two elongated connecting elements are arranged at a minimum intermediate distance and provides a stop position for further displacement.

35 According to a second aspect of the present invention, the above objects and advantages are obtained by:

A shim system comprising two shims according to any of claims 1-8.

By arranging a shim system as defined above, it is possible to arrange a system where the individual shims are easy to manufacture, easy to use in operation, where the system has at least two shims for blocking-up building elements, where a transverse unintentional displacement between the two shims is avoided, and where each shim is still optimal to use as a single shim.

According to a third aspect of the present invention, the above objects and advantages are obtained by:

A method of for blocking up building elements comprising the following steps:

- providing at least two shims as defined above, or a system as defined above,
- arranging the two shims with the first surfaces and the first ends toward each other, and
- engaging said shims by moving said shims towards each other, such that said elongated connecting elements project into the opening of the other shim.

The above-defined method defines a method where the blocking-up of building elements is easily accomplished by using the defined shims, and where any unintentional transverse movement of the shims is avoided during intermediate positioning of the shims, and during the blocking-up of the building elements.

Fig. 1 shows a perspective view of a shim.

Fig. 2 shows a first perspective view of a shim system.

Fig. 3 shows a second perspective view of a shim system.

Fig. 4A shows a top view of a shim system and a cross section of the shim system.

Fig. 4B shows a top view of a shim system and a cross section of the shim system.

Fig. 4C shows a top view of a shim system and a cross section of the shim system.

The present invention will now be described more fully hereinafter with reference to the accompanying drawings, in which exemplary embodiments of the invention are shown. The invention may however be embodied in different forms and should not be construed as limited to the embodiments set forth herein. Rather, these embodiments are provided so that this disclosure will be thorough and complete, and will fully convey the scope of the invention to those skilled in the art. Like reference numerals refer to like

elements throughout. Like elements will thus not be described in detail with respect to the description of each figure.

Fig. 1 shows a perspective view of a shim 10. The shim 10, which is manufactured from a plastic material such as polyethylene (PE) or any other suitable material is shown having a generally wedge-shaped profile. The shim 10 thus functions as a commonly known wedge, but may alternatively be manufactured as a flat shim, which typically functions as a spacer when blocking up, e.g., building elements.

The shim 10 has a first surface 12, and a second surface 14, a first 16 and second end 18, and first 20 and second sides 22.

The shim 10 is shown having a surface structure which provides a friction in the longitudinal direction of the shim 10, which friction prevents slippage between the shim 10 and a building element, or if used in a shim system, having two or more shims, arranged on top of each other, preventing any slippage between the individual shims 10 and the shims and the building element. The surface structure of the shim 10 is shown as rows of teeth, but may alternatively be arranged as staggered rows of projections for creating a friction in the direction between the first 16 and second end 18 and in the direction between the first 20 and second side 22. The shim 10 is further shown with a number of square openings on the first surface 12 and the second surface, which are preferably not through-going, such that a fastener, such as a screw or nail, may be driven through the shim 10 and into a neighbouring structure, such as a building element.

The shim 10 is shown having an opening 26, which is shown as a longitudinal through-going opening 26, extending between the first surface 12 and the second surface 14. The opening 26 is shown extending substantially the entire length of the shim, but may be arranged such that the opening only extends part of the length of the shim 10.

The shim 10 is further shown having an elongated connecting element 24 arranged at the first surface 12 of the shim 10. The elongated connecting element 24 has a first connecting end 28 connected to the wedge shape at said first end 16, and a second free end 30 arranged towards the second end 18 of the wedge.

Arranging the shim 10 with an opening 26 and the elongated connecting element 24, as illustrated, provides the possibility of interconnecting two substantially similar shims 10 such that a second substantially similar shim 10 can be connected to a first shim 10,

with the first surfaces 12 towards each other, with the free ends 30 of each elongated connecting element 24 extending into the opening 26 of the other shim 10.

Hereby is arranged a shim system 10' as shown in figure 2, where the two shims 10 are displaceable in relation to each other in the longitudinal direction of the shims 10, but
5 locked for displacement in the transverse direction, due to the elongated connecting elements 24 and the openings 26.

However, due to the arrangement of the elongated connecting element 24 and the opening 26, where the elongated connecting element 24, as shown, projects from the first
10 surface 12, it is possible to force the elongated connecting element into the opening, such that it does not project from the first surface 12. The shim 10 may hereby be used as a common-type single shim.

The elongated connecting element 24 is preferably arranged flexible. As the shim 10 is
15 preferably manufactured from a plastic, such as PU, the material provides some flexibility in itself. The shim 10 may however also be arranged, such that the elongated connecting element comprises a weakening 32 (also shown in figure 4A), which increases the flexibility of the elongated connecting element 24 in the direction through the opening 26, but not in the transverse direction of the shim 10. The elongated connecting element
20 may hereby more easily be bent into and/or out of the opening 26.

The weakening 32 is shown arranged in the proximity of the junction between the elongated connecting element 24 and the first end 16. The weakening 32 may however also be arranged in the junction itself or arranged at a further distance from the junction than
25 illustrated.

In the shown embodiment, the elongated connecting element 24 is part of the shim 10 and integrated into the wedge, but may in an alternative embodiment be part of the shim 10, as an independent element, which is releasably connected to the wedge at the first
30 end 16. The wedge and elongated connecting element may therefore comprise releasable coupling elements, such as a releasable pivot joint.

Fig. 2 shows a first perspective view of a shim system 10'. The two illustrated shims 10 each comprise an elongated connecting element 24 at the first surface 12, where the
35 elongated connecting elements 24 have a first connecting end 32 (shown in fig. 1), and a second free end 30 arranged towards the second end of the main part. Each shim 10

comprises an opening 26 at the first surface 12, such that the shims 10 are connected to each other with the first surfaces 12 towards each other and by the free ends 30 of each elongated connecting element 24 extending into the opening of the other shim 10. The figure shows a position of the two interconnected shims 10, where the shims 10 provides a maximum height of the shim system 10', i.e., the two shims 10 are displaced in relation to each other, such that the connecting ends 32 are arranged at a minimum distance in relation to each other, hereby functioning as a stop for further displacement.

Fig. 3 shows a second perspective view of a shim system 10'. Figure 3 shows a similar shim system 10' as illustrated in figure 2 but illustrated with the shims 10 having a not fully interconnected position. The two shims 10 are interconnected in the same manner as in figure 2, but may be further displaced in relation to each other, such that the height of the shim system 10' may be further increased.

Fig. 4A-4C show a top view and a cross section of a shim system 10'. Fig. 4A-4C show three different positions of the shim system 10'.

Of the three embodiments, fig. 4A show a shim system 10' having the least total height. The two shims 10 are illustrated directly on top of each other, with the elongated connecting elements 24 each projecting into the opening 26 of the other shim. The shim system 10' hereby prevents the shims from moving transversely in relation to each other, in relation to the longitudinal direction of the shims and/or in relation to the longitudinal direction of the elongated connecting elements 24.

Fig. 4A further illustrates the weakening 32 arranged on the elongated connecting element 24 at the connecting end 28, as described above in relation to fig. 1.

Fig. 4B and 4B show two further embodiments of the shim system 10' illustrated in fig. 4A, but with the two shims 10 being further displaced in relation to each other with the result of an increased height of the shim system 10'.

Fig. 4C shows the position of the two shims 10, in which the shim system 10' has the most expanded height and the connecting ends 28 of the elongated connecting elements 24 are arranged with a minimum distance.

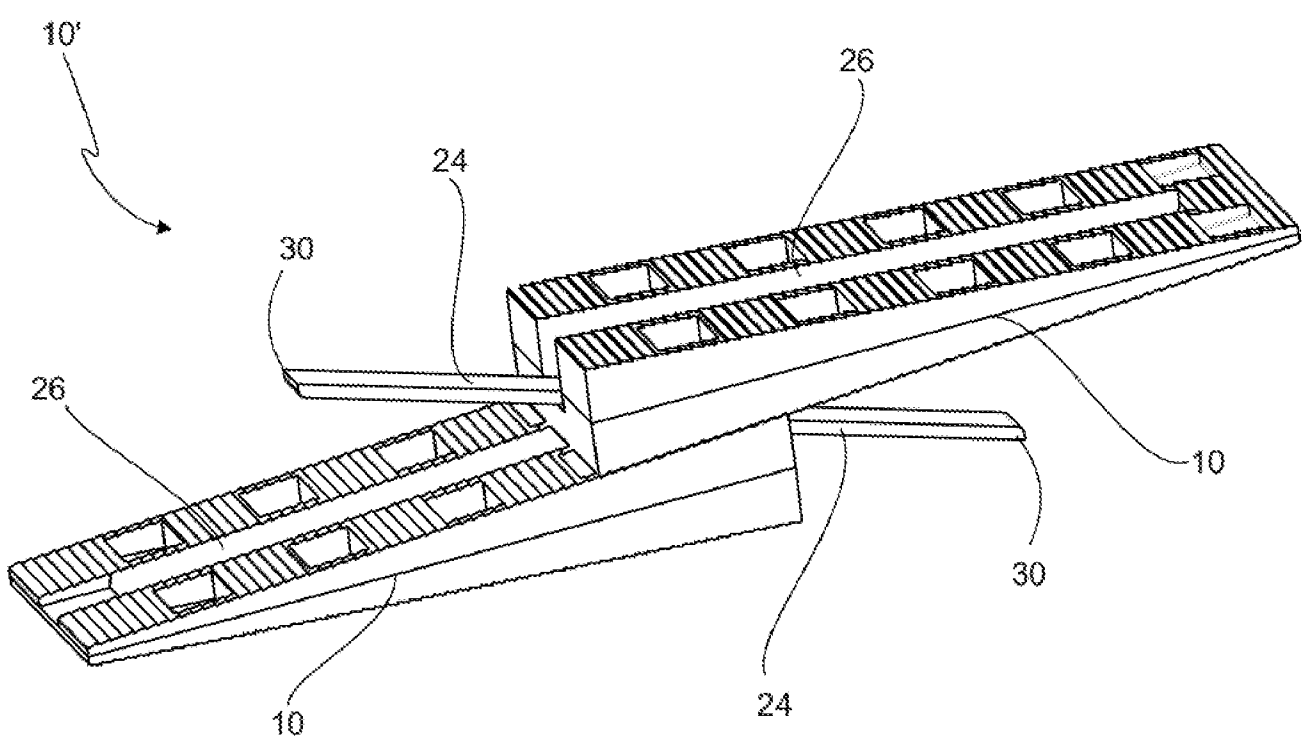
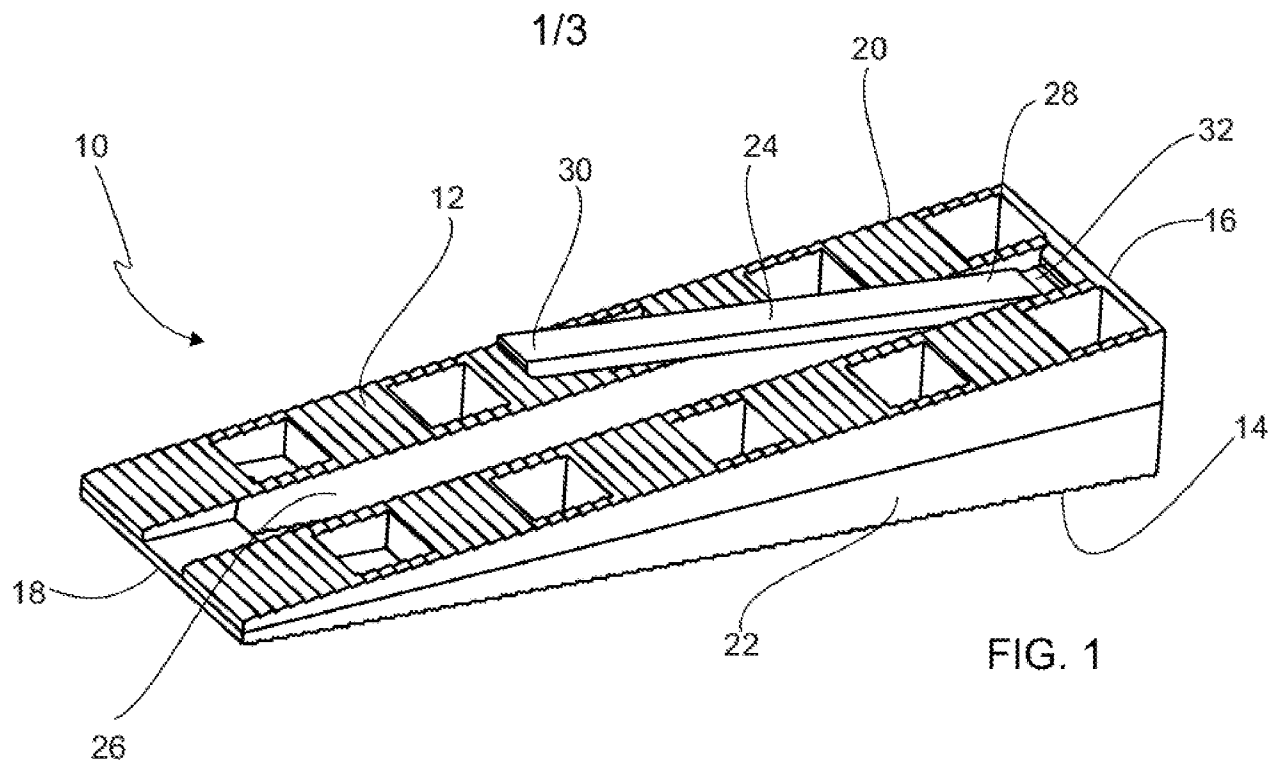
In the following is given a list of reference signs that are used in the detailed description of the invention and the drawings referred to in the detailed description of the invention.

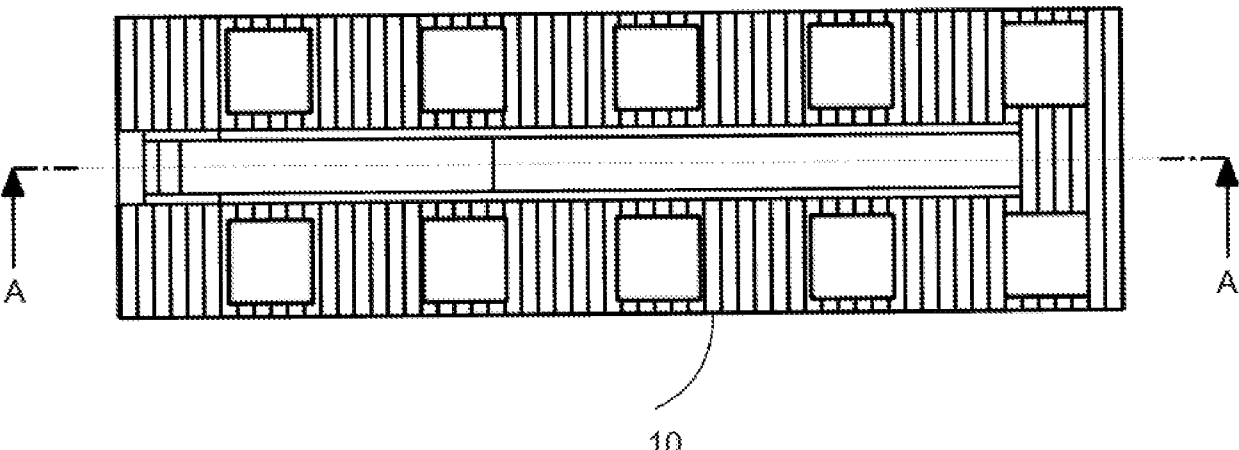
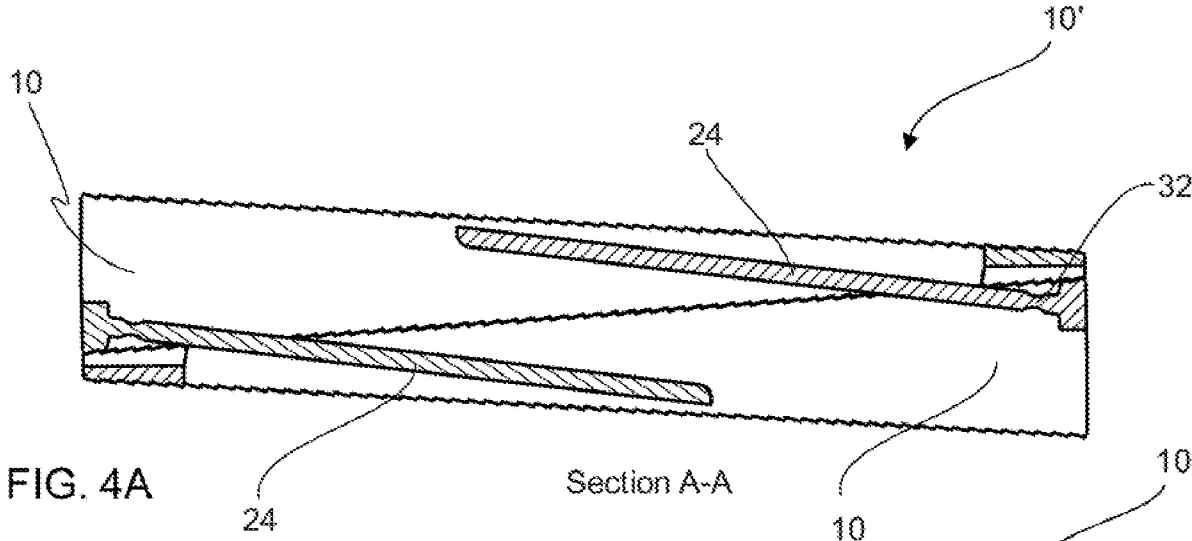
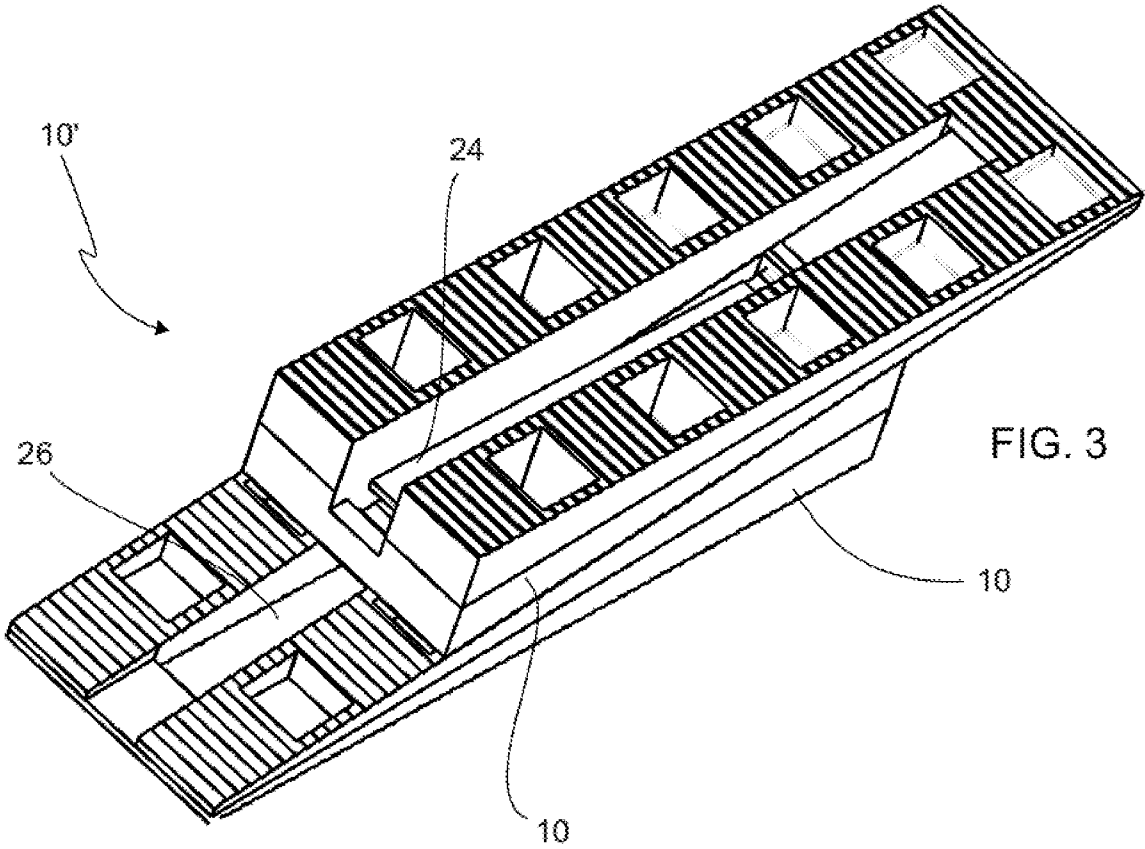
	10	Shim
	10'	Shim system
	12	First surface
5	14	Second surface
	16	First end
	18	Second end
	20	First side
	22	Second side
10	24	Elongated connecting element
	26	Opening
	28	Connecting end
	30	Free end
	32	Weakening

PATENTKRAV

1. En kile (10) til opklodsning af bygningselementer, såsom gulve eller vinduer/døre, hvor kilen (10) omfatter en hoveddel med en første overflade (12), og en anden overflade (14), en første og anden ende (16, 18) og første og anden sider (20, 22), hvor kilen (10) omfatter et aflangt forbindelseselement (24) ved den første overflade (12),
5 **kendetegnet ved, at** det aflange forbindelseselement (24) har en første forbindelsesende (28) forbundet med hoveddelen ved den første ende (16), og en anden fri ende (30) anbragt mod den anden ende (18) af hoveddelen, og hvor kilen (10) omfatter en
10 åbning (26) ved den første overflade (12), således at en anden i det væsentlige identisk kile kan forbindes med kilen (10) med de første overflader (12) mod hinanden, ved at de frie ender (30) af hvert aflangt forbindelseselement (24) strækker sig ind i åbningen (26) af den anden kile.
- 15 2. Kile (10) ifølge krav 1, hvor det aflange forbindelseselement (24) er forbundet med hoveddelen ved en kant af åbningen (26).
3. Kile (10) ifølge et hvilket som helst af de foregående krav, hvor det aflange forbindelseselement (24) er fleksibelt, således at det aflange forbindelseselement (24) kan
20 tvinges ud af en neutral startposition og fjedre tilbage i den neutrale startposition.
4. Kile (10) ifølge et hvilket som helst af de foregående krav, hvor det aflange forbindelseselement (24) omfatter en svækkelse (32) ved forbindelsesenden (28), hvilken svækkelse (28) virker som et hængsel således, at det aflange forbindelseselement
25 (24) kan tvinges ud af en neutral startposition og fjedre tilbage til den neutrale startposition.
5. Kile (10) ifølge et hvilket som helst af de foregående krav, hvor den første (20) og den anden side (22) er langsgående sider, der definerer en længde af kilen (10), idet
30 det aflange forbindelseselement (24) har en længde, der strækker sig over størstedelen af længden af kilen (10).
6. Kile (10) ifølge et hvilket som helst af de foregående krav, hvor den første (12) og den anden overflade (14) er anbragt i en vinkel i forhold til hinanden, hvorved de dan-
35 ner en kile.

7. Kile (10) ifølge et hvilket som helst af de foregående krav, hvor det aflange forbindelseselement (24) er integreret med hoveddelen.
8. Kile (10) ifølge et hvilket som helst af de foregående krav, hvor det aflange forbindelseselement (24) er anbragt i en skrå vinkel i forhold til den første overflade (12).
9. Et kilesystem (10') omfattende to kiler (10) ifølge et hvilket som helst af kravene 1-8.
10. Fremgangsmåde til opklodsning af bygningselementer omfattende følgende trin:
- 10 • tilvejebringelse af mindst to kiler (10) ifølge et hvilket som helst af kravene 1-8, eller et system (10') ifølge krav 9,
 - anbringelse af de to kiler (10) med de første overflader (12) og de første ender (16) mod hinanden,
 - kilerne (10) bringes i indgreb med hinanden ved at kilerne (10) bevæges mod
 - 15 hinanden således, at de aflange forbindelseselementer (24) rager ind i åbningen (26) af den anden kile (10).





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FIG. 4B

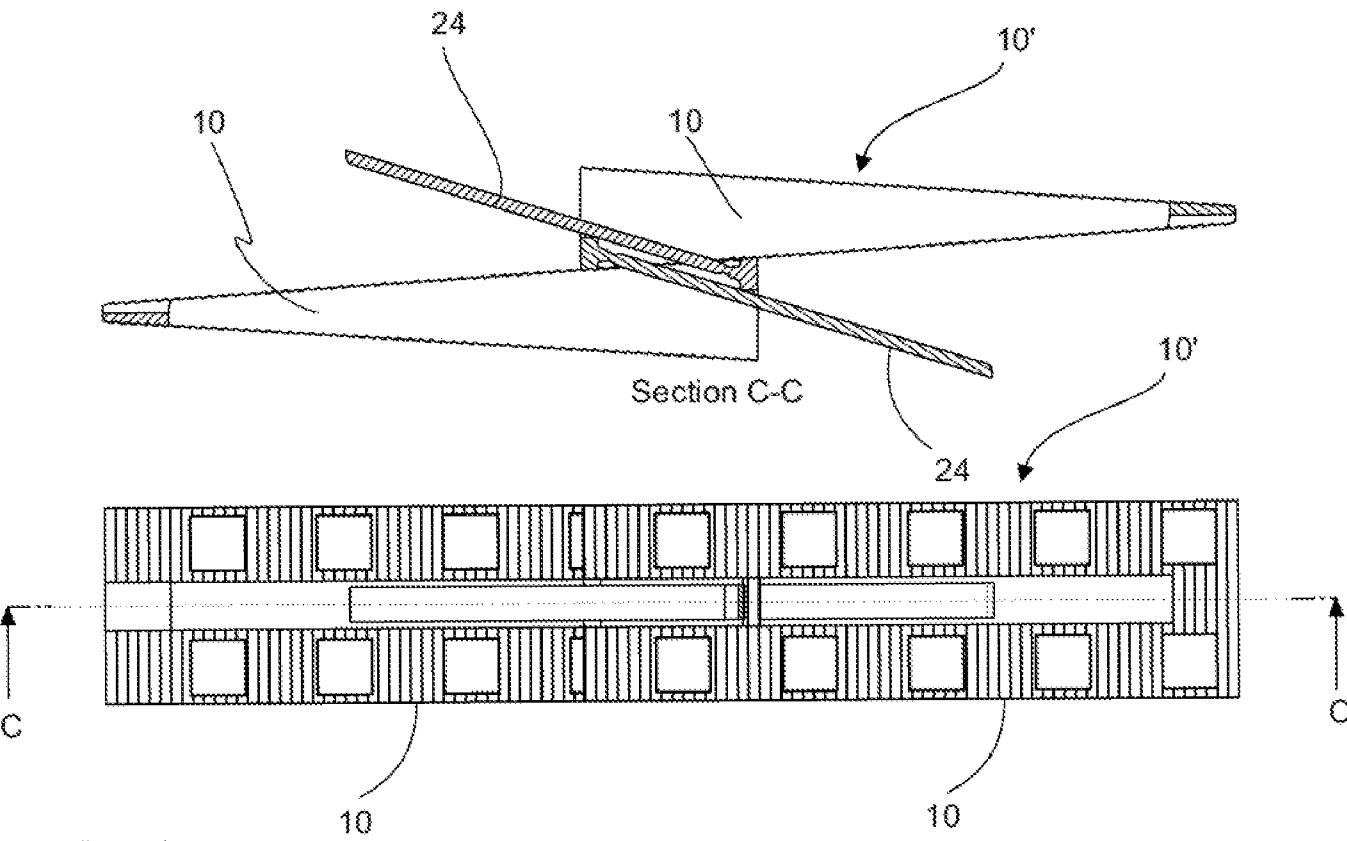
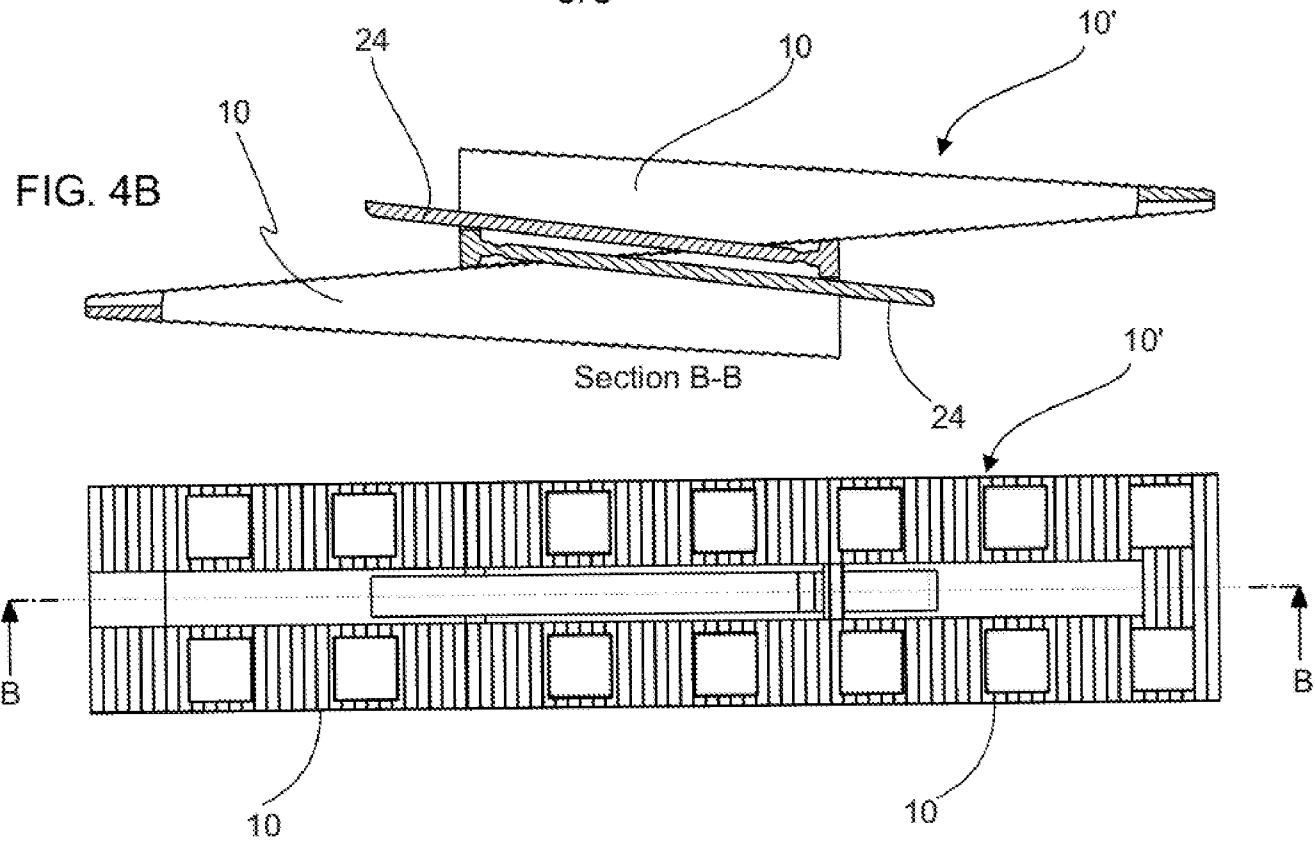


FIG. 4C

SEARCH REPORT - PATENT		Application No. PA 2021 00912
1. ☐ Certain claims were found unsearchable (See Box No. I). 2. ☐ Unity of invention is lacking prior to search (See Box No. II).		
A. CLASSIFICATION OF SUBJECT MATTER E06B 1/60 (2006.01), F16B 2/14 (2006.01) According to International Patent Classification (IPC)		
B. FIELDS SEARCHED PCT-minimum documentation searched (classification system followed by classification symbols) CPC/IPC: E06B, F16B Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched DK, NO, SE, FI: IPC-classes as above. Electronic database consulted during the search (name of database and, where practicable, search terms used) EPODOC, WPI, ENGLISH FULL-TEXT, GERMAN FULL-TEXT		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant for claim No.
A	<u>US 8813437 B1</u> (SPOFFORD, C J) 2014.08.26 See abstract and figures 2-3B.	1-10
A	<u>US 2006/0022180 A1</u> (SELNESS, J N) 2006.02.02 See figures 1 and 9-10.	1-10
A	<u>DE 202016003416 U1</u> (SEELAND, D) 2016.07.25 See figures 2 and 4b.	1-10
☐ Further documents are listed in the continuation of Box C.		
* Special categories of cited documents: "A" Document defining the general state of the art which is not considered to be of particular relevance. "D" Document cited in the application. "E" Earlier application or patent but published on or after the filing date. "L" Document which may throw doubt on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified). "O" Document referring to an oral disclosure, use, exhibition or other means.	"P" Document published prior to the filing date but later than the priority date claimed. "T" Document not in conflict with the application but cited to understand the principle or theory underlying the invention. "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. "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. "&" Document member of the same patent family.	
Danish Patent and Trademark Office Helgeshoj Allé 81 DK-2630 Taastrup Denmark Tel.: +45 4350 8000		Date of completion of the search report 07 March 2022 Authorized officer Mette Holm Meyer Tel.: +45 43 50 81 97

SEARCH REPORT - PATENT	Application No. PA 2021 00912
SUPPLEMENTAL BOX	
Continuation of Box [.]	