(19) DANMARK

(10) **DK/EP 4286596 T3**

(12) Oversættelse af europæisk patentskrift

Patent- og Varemærkestyrelsen

(51) Int.Cl.: ***E 02 D 29/12 (2006.01)*** ***H 02 G 9/10 (2006.01)***

(45) Oversættelsen bekendtgjort den: **2025-05-19**

(80) Dato for Den Europæiske Patentmyndigheds bekendtgørelse om meddelelse af patentet: **2025-02-19**

(86) Europæisk ansøgning nr.: **23166774.2**

(86) Europæisk indleveringsdag: **2023-04-05**

(87) Den europæiske ansøgnings publiceringsdag: **2023-12-06**

(30) Prioritet: **2022-06-03 DE 102022114132**

(84) Designerede stater: **AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC ME MK MT NL NO PL PT RO RS SE SI SK SM TR**

(73) Patenthaver: **Langmatz GmbH, Am Gschwend 10, 82467 Garmisch-Partenkirchen, Tyskland**

(72) Opfinder: **Straßberger, Thomas, , 82491 Grainau, Tyskland**

(74) Fuldmægtig i Danmark: **Zacco Denmark A/S, Arne Jacobsens Allé 15, 2300 København S, Danmark**

(54) Benævnelse: **Skakt**

(56) Fremdragne publikationer:
EP-A1- 1 587 199
DE-A1- 102011 116 874
DE-B3- 10 314 897
DE-U1- 202007 014 465

SHAFT

Description

[0001] The invention relates to a shaft, the shaft walls of which consist of wall elements placed on top of one another and manufactured from plastic material in an injection moulding process, corresponding to the preamble of claim 1.

[0002] Usually, two or three rows of wall elements are arranged one above the other, wherein different height dimensions may be allocated to the uppermost wall element so that the upper side of the shaft reaches as close as possible to the surrounding level. The upper end of the shaft walls thus formed contains a steel frame, which is usually a peripheral rectangular profile, on which one or more shaft covers are arranged, which are enclosed by a flat steel bar fastened externally to the steel frame.

[0003] The upper edge of the flat steel bar and the upper side of the shaft cover or covers must be at the same height as the surroundings of the shaft when the shaft is completed, as such a shaft is commonly accessible by foot and by vehicle. For setting the height of the upper end of the shaft, it is known that the steel frame may bear on spindles, the length of which is set such that the shaft cover or covers are exactly at the surrounding level.

[0004] Since the shaft cover or covers may be subjected to high mechanical stresses, the upper end of the shaft must have sufficiently high stability.

[0005] From DE 103 14 897 B3 and EP 1 587 199 A1, systems for accommodating distributor devices of copper and/or glass fibre cables are known in which the shafts installed in the floor are composed of a plurality of shaft walls consisting of plastic material, the upper end of which has a steel frame, arranged on which are one or more shaft covers. DE 20 2007 014 465 U also discloses an underfloor shaft, in which the frame elements are combined before the underfloor shaft is recessed into the floor.

[0006] The object of the present invention is to provide a shaft of the type mentioned

at the beginning, in which, in the case of height adjustment with extended spindles, it is possible to check whether the associated measures are carried out correctly. In particular, it should be possible to check whether all the spindles are extended correctly and whether the low-viscosity mortar introduced is sufficient to support the raised steel frame.

[0007] According to the invention, this object is achieved by the features of claim 1.

[0008] Advantageous designs of the invention are characterised in the dependent claims.

[0009] The invention provides that fastened on the upper side of the shaft walls there is a head frame including a plate-shaped section, which rests on the shaft walls, and a casing section, which is bent upwardly, in the installed position, which is arranged, in the installed position, on the inner side of the shaft walls. The steel frame has a respective spindle at each corner region, which is extendable for height adjustment of the steel frame so that the steel frame rests either directly on the head frame or on extended spindles and a supporting layer of mortar arranged on the head frame. Further, according to the invention, it is provided that formed in the region of the spindles there is a respective opening in the casing section of the head frame, arranged in which there is a viewing window, which can be removed in order to be able visually to monitor the region of the spindle.

[0010] With the viewing window removed from the inner side of the shaft, this opening allows seeing whether all the spindles are extended correctly and whether the low-viscosity mortar introduced reaches a sufficient height in order to support the steel frame and thus bear it in a stable manner.

[0011] It is preferred that the plate-shaped, removable viewing window has means at the boundary, e.g. in the form of hooks, using which the viewing window can be fastened to the boundary of the window aperture.

[0012] The viewing window may also be made of a see-through material so that it does not have to be removed for monitoring.

[0013] The casing section, which preferably adjoins the plate-shaped section at an angle of 90°, reliably prevents the low-viscosity mortar from partially running off into the interior of the shaft.

[0014] According to a further proposal of the invention, it may also be provided that a peripheral outer casing is fastened to the opposite side of the shaft wall with clips, which also prevents the mortar from running off there. The installation costs of the shaft may thereby be lowered.

[0015] The head frame may be composed of a plurality of head frame portions, which abut one another or engage one another at the corners of the typically rectangular shaft. The individual head frame portions may include hooks on a lateral boundary section, which are slid into the associated shaft walls in order to initially position the head frame portions correctly on the shaft walls. On the opposite boundary, the head frame portions may include locking latches, which engage openings in the shaft walls, with the entire head frame thus fixed immovably on the upper side of the shaft walls.

[0016] In the region of the viewing windows, the head frame may preferably include a respective mounting for a support plate, on which an extended spindle bears. The support plates withstand a large vertical force, which may be elicited by traffic load on the shaft cover.

[0017] The head frame is preferably manufactured integrally in a plastic injection moulding process, preferably from PC. However, it is also within the scope of the invention that the plate-shaped section and the casing section of the head frame may be combined in a suitable manner as separately manufactured components.

[0018] Further details of the invention will become apparent from the following description of a preferred embodiment and from the drawings. In the drawings:

Figure 1

shows a perspective view of a complete shaft;

Figure 2

shows two depictions of the assembly of a head frame;

Figure 3

shows a head frame portion with hooks for positioning and locking latches for fixing;

Figure 4

shows the assembly of a viewing window;

Figures 5A to 5D

show a rear view, a side view, a front view and a perspective view of a viewing window;

Figure 6

shows a sectional depiction of the upper end of a shaft with a viewing window;

Figure 7

shows a schematic depiction of the adjustment to surrounding level;

Figure 8

shows the assembly of an outer casing at the upper boundary of the shaft wall.

[0019] Figure 1 shows a perspective view of a shaft, the shaft walls of which consist of three wall elements 1 placed on top of one another. The upper end of the shaft is formed by a head frame 2 and a steel frame 3 arranged above it, on which a peripheral flat steel bar 4 is fastened, in which two shaft covers 5 are arranged to be flush.

[0020] Figure 2 shows a head frame 2, which is fastened on the upper side of two wall elements 1 of various heights. The head frame 2 consists of four head frame portions 6, which are joined together at the corners of the rectangular shaft. The head frame portions 6 consist of an essentially plate-shaped section 7, which is fastened on the associated shaft wall, and a casing section 8, which is bent upwardly at right angles and faces the inner side of the shaft. In the upper boundary region of the casing section 8, openings 9 are formed, into which locking bolts of the shaft covers may enter. The openings 9 are releasably closable by means of plugged-on closure plates (not depicted).

[0021] Figure 3 illustrates a head frame portion 6, which is fastenable on the upper side of a shaft wall without the aid of tools. For this purpose, the head frame portion 6 is provided with hooks 11 and locking latches 12. The hooks 11 form clamping means, which are slid into the shaft wall from the outer side of the shaft in order to initially position the head frame portion 6 correctly on the upper side of the shaft wall. On the inner side of the shaft, the locking latches 12 engage openings in the shaft wall, wherein this locking fixes the head frame portion 6 or the entire head frame 2 on the shaft wall in a non-sliding manner.

[0022] In the right end region of the head frame portion 6 or in the corner region of the head frame 2, an opening 10 is formed in the casing wall 8, into which a removable viewing window 13 is insertable by sliding it in and locking it. The viewing window is depicted in several views in Figures 5A to 5C. At a location aligned with the opening 10 for the viewing window 13, a depression 14 is formed in the plate-shaped section 7 of the head frame 2, into which a support plate 18 is inserted, on which a spindle, described further below, bears for height adjustment of the steel frame 3.

[0023] In the left-hand illustration, Figure 4 illustrates the opening 10 in the casing wall 8 without a viewing window 13, wherein means for receiving hooks 14a, which are formed at the boundary of the viewing window 13, are implied at the boundary of the opening 10. The viewing window 13 is assembled by sliding the viewing window 13 in and locking it by means of the hooks 14a. In the right-hand illustration of Figure 4, the viewing window 13 is depicted in the inserted state.

[0024] Figure 5 depicts details of the viewing window, which contains a smooth closed surface 15, the boundary of which is reinforced by a peripheral frame 16, with hooks 14a projecting laterally beyond the surface 15 moulded thereon.

[0025] Figure 6 shows a vertical section through the upper end of a shaft with the upper wall element 1. On the upper side of the wall element 1, the head frame is fastened by sliding the hooks 11 of the plate-shaped section 7 of the head frame 2 into the wall element 1 in a clamping manner. In the steel frame 3 there is an end cap with

a spindle 17, which, in the depiction of Figure 6, is extended downwards for height adjustment and bears on a support plate 18 arranged in the depression 14. This raises the steel frame 3 to such an extent that the upper side of the shaft cover 5 arranged on the steel frame 3 and the upper edge of the steel sheet 4 surrounding the cover 5 match the surrounding level.

[0026] The resulting gap between the lower edge of the steel frame 3 and the plate-shaped section 7 of the head frame 2 must be filled with mortar introduced.

[0027] Furthermore, Figure 6 shows a viewing window 13 in the head frame portion 6 offset by 90°, which is removed in order to be able to monitor the region of the spindle offset by 90°. The schematic depiction of Figure 7 shows the view of a spindle 17, which is uncovered by removing a viewing window. The adjustment to surrounding level is implied by two arrows H, wherein this gap is filled with mortar.

[0028] Figure 8 shows a peripheral outer casing 19, which complements the inner casing wall 8 so that mortar cannot escape to any side. The outer casing 19 is assembled by plugging the individual sheet portions together and by fixing the entire outer casing to the upper end region of the wall element 1 by means of what are known as Christmas tree clips.

Patentkrav

1. Skakt, som er sammensat af en flerhed af skaktvægge (1) bestående af plastmateriale, hvis øvre ende har en stålramme (3), hvorpå der er anbragt et eller flere skaktdæksler (5),
kendetegnet ved, at der på oversiden af skaktvæggene (1) er fastgjort en topramme (2),
at toprammen (2) omfatter et område (7), der hviler på skaktvæggene (1), og har en forskallingssektion (8), der er bøjet opad i den installerede position, og som er anbragt i den installerede position på indersiden af skaktvæggene (1),
at stålrammen (3) ved hvert hjørneområde omfatter en respektive spindel (17), som kan forlænges til højdejustering af stålrammen (3), således at stålrammen (3) hviler enten direkte på toprammen (2) eller på forlængede spindler (17) og på et støttelag af mørtel, der er anbragt på toprammen (2),
og at der ved hvert hjørneområde er dannet en respektive udsparing (10) i forskallingssektionen (8) af toprammen (2), hvori der er anbragt et udsigtsvindue (13), som fortrinsvis er aftageligt, for visuelt at kunne overvåge den korrekte udførelse af installationen af stålrammen (3).

2. Skakt ifølge krav 1,
kendetegnet ved,
at udsigtsvinduerne (13) omfatter midler (14a) til at glide ind i og låse de tilhørende udsparinger (10).

3. Skakt ifølge et af krav 1 eller 2,
kendetegnet ved,
at i området omkring udsigtsvinduerne (13) har hovedrammen (2) en tilhørende montering (14) til en støtteplade (18), hvorpå en forlænget spindel (17) hviler.

4. Skakt ifølge et af kravene 1 til 3,

kendetegnet ved,

at hovedrammen (2) er sammensat af en flerhed af hovedrammedele (6).

5. Skakt ifølge et af kravene 1 til 4,

kendetegnet ved,

at en ydre omkredsforskalling (19) kan anbringes på ydersiden af skaktvæggen (1) med klemmer.

6. Skakt ifølge et af kravene 1 til 5,

kendetegnet ved,

at den pladeformede sektion (7) og forskallingssektionen (8) af hovedrammen (2) er fremstillet i ét stykke med en plastsprøjtestøbningsproces.

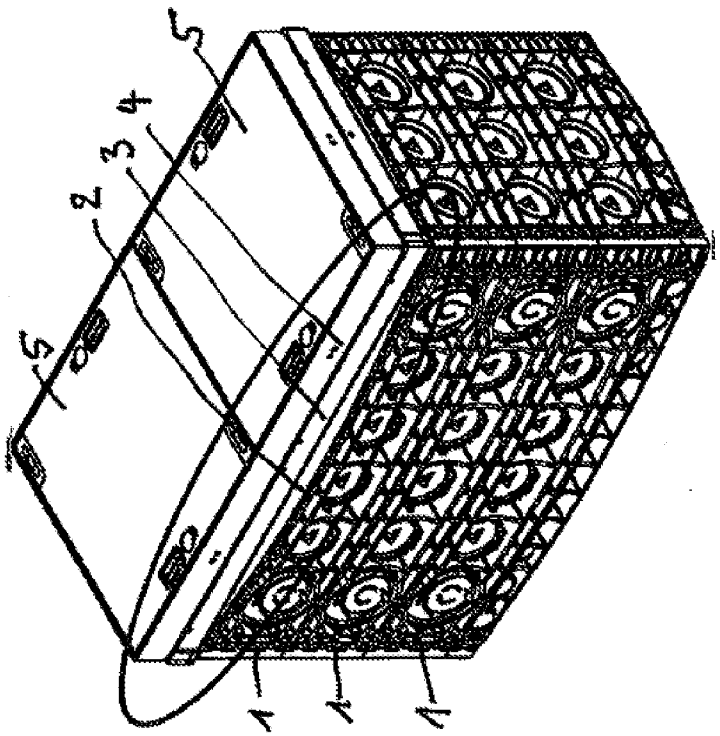

Fig. 1

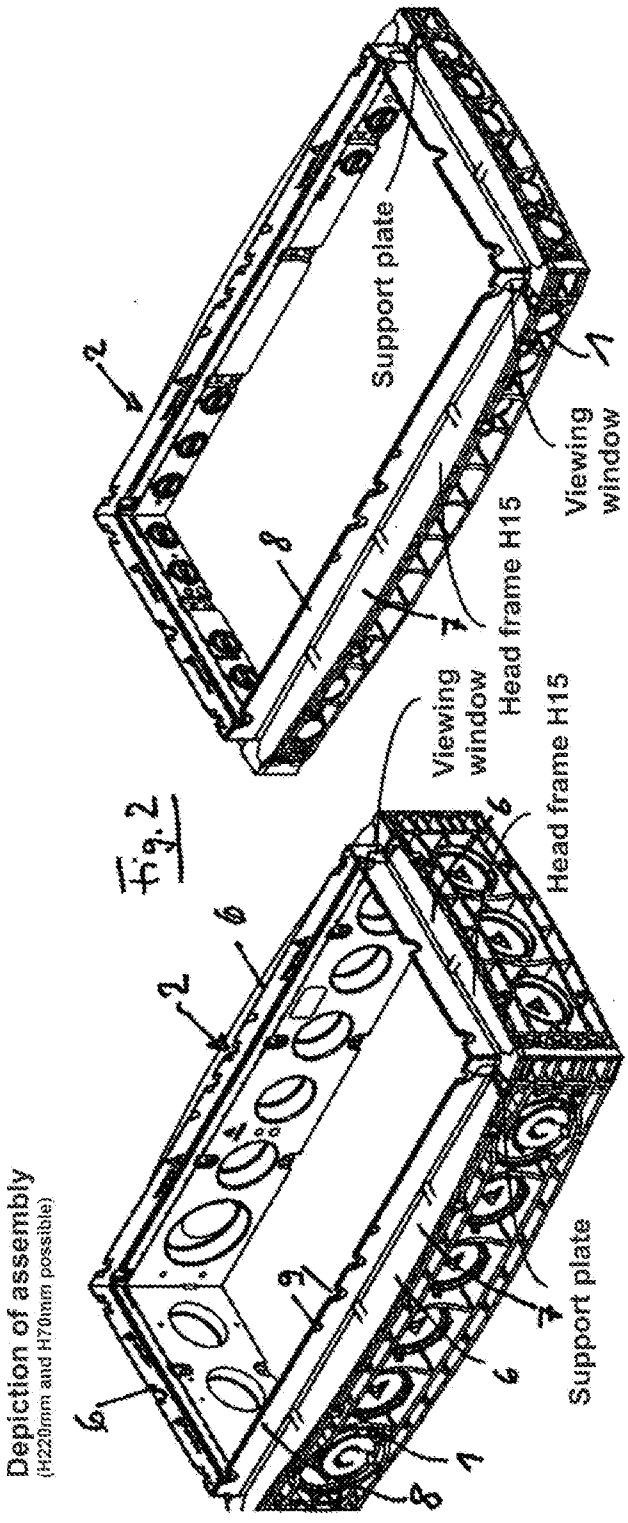
Support plate
Viewing window
Head frame H15
Viewing window
Head frame H15
Support plate
Depiction of assembly
(H220mm and H70mm possible)

Fig. 2

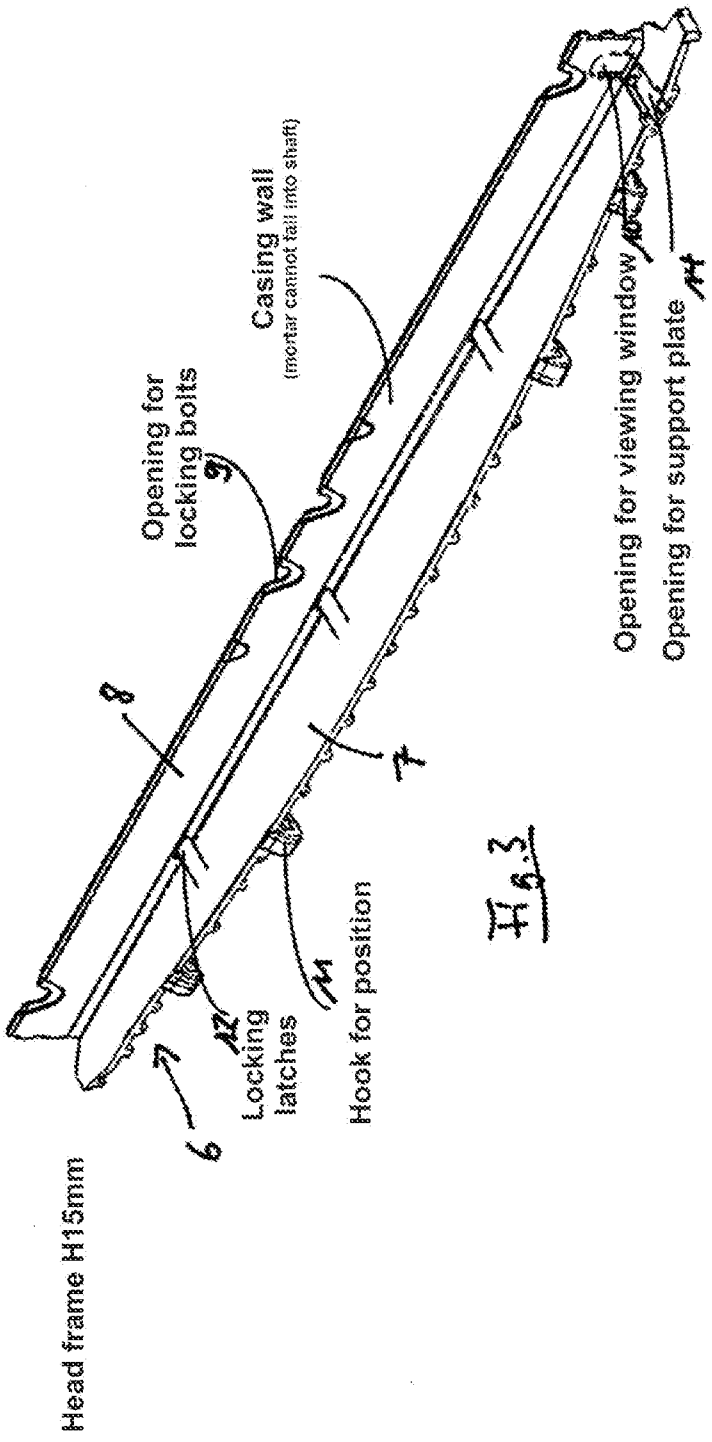
Casing wall
(mortar cannot fall into shaft)
Opening for locking bolts
Opening for viewing window
Opening for support plate
Head frame H15mm
Locking latches
Hook for position

Fig.3

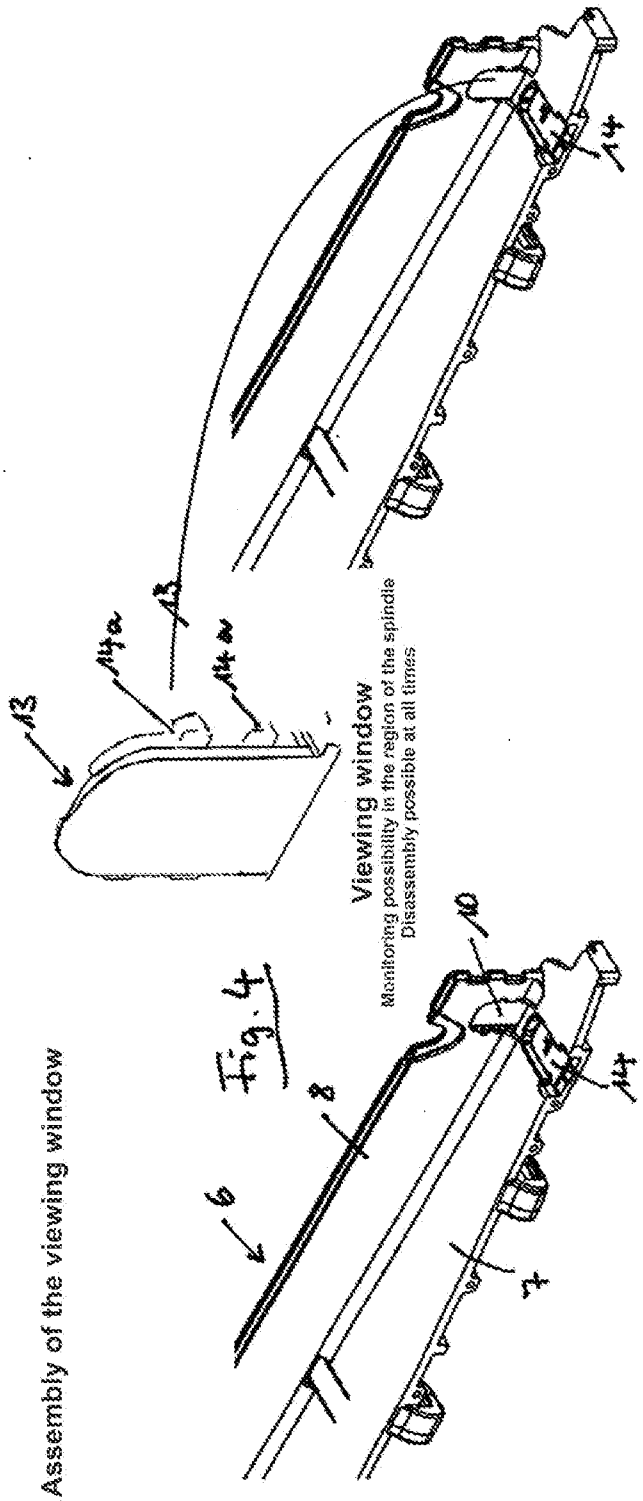
Assembly of the viewing window
Viewing window
Monitoring possibility in the region of the spindle
Disassembly possible at all times

Fig. 4

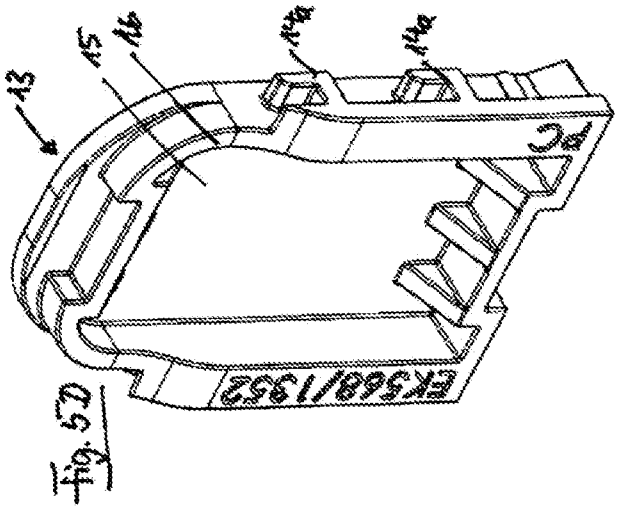

Fig. 5D

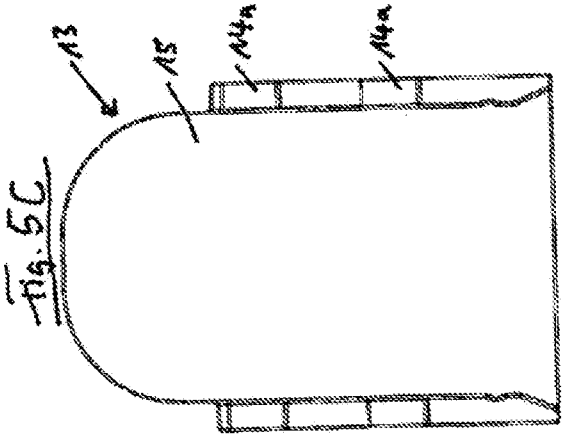

Fig. 5C

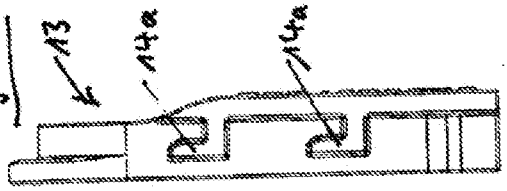

Fig. 5B

Depiction of viewing window (transparent)

Assembly via sliding in & locking

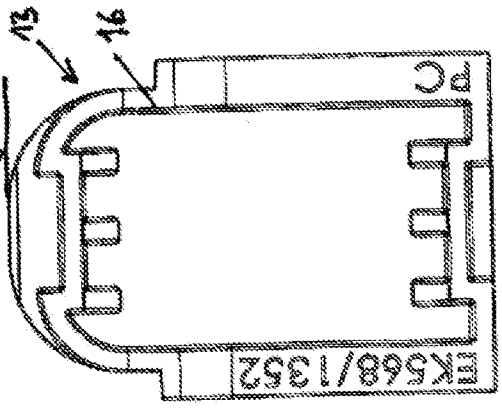

Fig. 5A

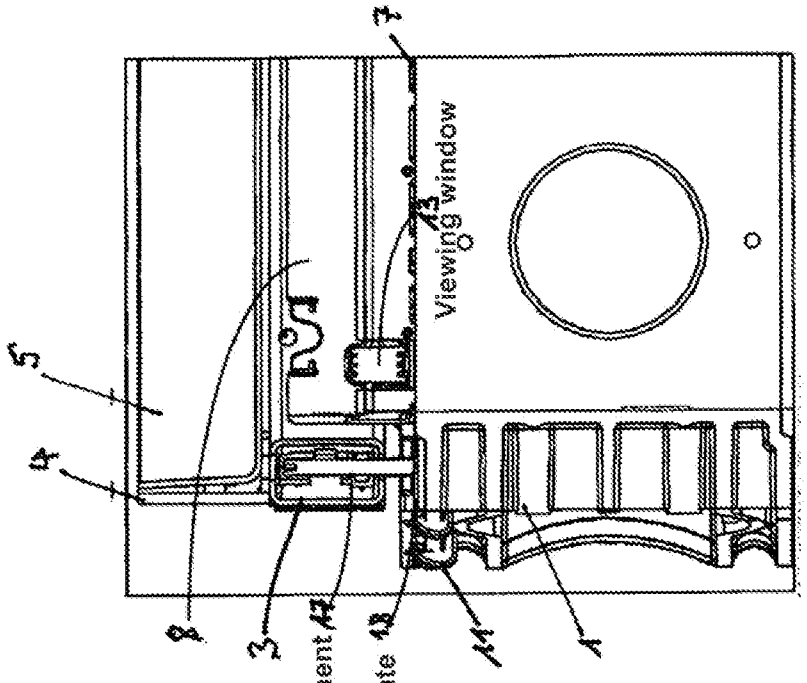
Viewing window
Casing wall
End cap with spindle for height adjustment
Support plate
Sectional depiction

Fig. 6

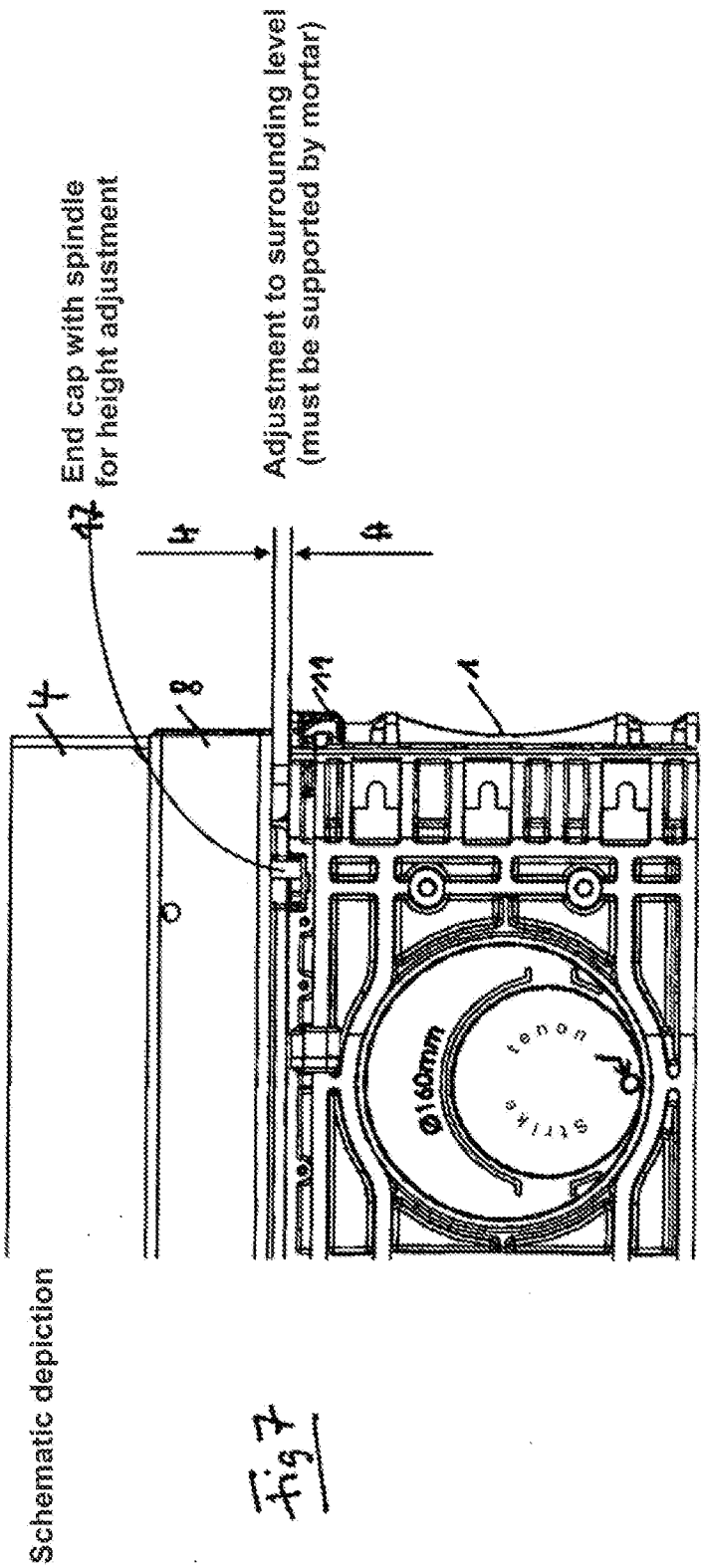
End cap with spindle
for height adjustment
Adjustment to surrounding level
(must be supported by mortar)
42
4
4
4
8
11
1
Ø160mm
Schematic depiction

Fig 7

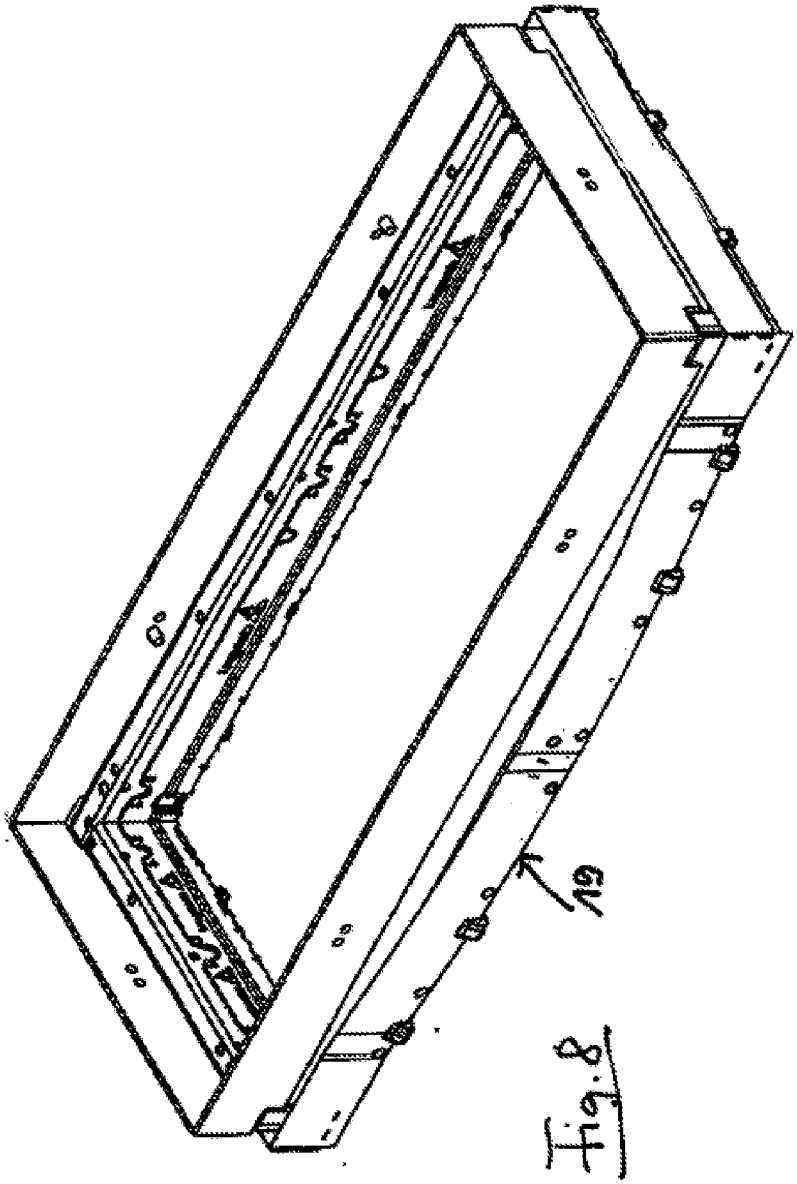

Fig.8