



(11) **EP 3 170 959 A1**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
24.05.2017 Bulletin 2017/21

(51) Int Cl.:
E06B 1/60 (2006.01) E04F 21/00 (2006.01)

(21) Application number: **16460082.7**

(22) Date of filing: **10.11.2016**

(84) Designated Contracting States:
**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 MK MT NL NO
PL PT RO RS SE SI SK SM TR**
Designated Extension States:
BA ME
Designated Validation States:
MA MD

(30) Priority: **18.11.2015 PL 41483215**
02.05.2016 PL 41706816

(71) Applicant: **Grobelny, Włodzimierz**
62-081 Przemierowo (PL)

(72) Inventor: **Grobelny, Włodzimierz**
62-081 Przemierowo (PL)

(74) Representative: **Golebniak, Andrzej**
Kancelaria Patentowa
A.J. Golebniakowie
ul. Partyzancka 7
PL-61-495 Poznan (PL)

(54) **A WINDOW INSTALLATION APPARATUS**

(57) The herein described invention is a window installation apparatus comprising of at least one wedge-shaped distance piece.

The apparatus according to the invention comprises a body (1) connected in a sliding manner to a clamp (3) between which an expansion unit is positioned, comprising at least one wedge (6) and a lead screw (9) connected by means of a threaded connection with an opening (12)

of the wedge (6), wherein the body (1) has protrusions (2) positioned at its opposite sides, lateral rails (5) mating with brackets (4) of the clamp (3) and an opening (10) in a rest wall (11) for the lead screw (9), while the outer walls (7) of the wedge (6) and the inner walls (8) of the body (1) and the clamp (3) converge downward at the same angle.

EP 3 170 959 A1

Description

[0001] The herein described invention is an apparatus for window installation in the window opening.

[0002] The most common method of window installation in the window opening is known for years and consists in securing the frame by positioning it parallel to the wall, at a certain distance from its surface, simultaneously ensuring that the window is aligned vertically and horizontally. This method requires the installer to use a set of wooden wedges for preliminarily securing the frame. The wedges are delicately driven between the frame and the surface of the window opening. However, this method is problematic for a single installer, because it is not easy to perform with two hands only and thus requires a considerable amount of skills and experience. Namely, the installer must simultaneously hold the frame, insert a wooden wedge underneath it and drive it in with a hammer to secure it in place. As the wedge is being driven in, it secures the frame but simultaneously moves it relative to the outside surface of the wall. As a result, the procedure must be repeated several times and a spirit level must be used to ensure that the frame is vertically aligned. Consequently, window installation is often flawed in many ways, the most common issue being excessive clearance between the frame and the window opening.

[0003] The description of the utility model PL.107340 (U1) teaches a set of installation wedges shown in drawing **Pos. I**, characterized in that both the upper (3) and the bottom (4) surface of each wedge (1, 2) has preformed transverse ridges, and both these surfaces have preformed transverse rectangular cavities (6) shaped symmetrically to one another, and each lateral surface (7) of each wedge has guide protrusions, extending beyond the outline.

[0004] The international application WO2005068749 (A1) teaches a distance (expansion) piece that can replace a traditional wedge for fitting a window to an opening of a building, as shown in drawing **Pos. II**. In this embodiment, the distance piece consists of two part (2, 3) having inner surfaces (4, 5) facing towards each other and outer surfaces (7, 8) forming outer parts of the distance piece. The outer surface comprises resilient protrusions (15) located in cavities of the surfaces (23).

[0005] Importantly, the parts (2, 3) are movable relative to each other and can expand forming a wedge, whose cross-section forms an isosceles triangle. The parts can also be contracted. They are separated by means of a separation part (9) comprising a lock (17) and an ergonomically shaped grip (18) provided with a non-slippery surface. During use, the separation part (9) is inserted between the two parts (2, 3) which are apart. The separation part (9) is adapted to move linearly in the inner space to effect the movement of the set of first contact portions (10, 11), and those portions expand the parts (2 and 3). In addition, the parts (2, 3) are flexibly connected by means of a resilient connecting element, preferably

taking the form of rubber bands. The two circumferentially extending grooves (21) serve to fixate two of such rubber bands in place.

5 All parts of the distance piece can be made of wood or steel or made of a polymeric or ceramic material, a composite material comprising fibres of glass, carbon or Kevlar (polymer material).

The description of the international application WO2005102609 (A1) (also published as GB2413352 (B)) teaches a door support and alignment kit, as shown in drawing **Pos. III**. The kit comprises an elongated block (10) having a transverse slot (11) formed with two recesses (13, 15). Recess (13) receives a single wedge (12) while recess (15) can receive secondary wedges (14) positioned side-by-side.

10 A door (D) can be stood on its edge and engaged in the transverse slot (11) and rested on the upper surface of web (10A). Wedge (12) is slid into the transverse slot (11) alongside one face of the door (D), to wedge the door against end surface (11b), and hold the door vertically. Once the door has been planed to size, and positioned within the door frame, smaller wedges (14) can be inserted into the gaps between the edges of the door (D) and frame, to align the door within the inner frame.

15 **[0006]** The purpose of the present invention was to develop an apparatus for window installation that makes window installation significantly easier not only to a skilled installer but also to an inexperienced person lacking the necessary skills.

20 **[0007]** In accordance with the present invention, the window installation apparatus comprising of at least one wedge-shaped distance piece has a body connected in a sliding manner to a clamp. Between the body and the clamp, an expansion unit is positioned, comprising a wedge and a lead screw connected by means of a threaded connection to an opening in the wedge. The body has protrusions positioned at its opposite sides, lateral rails mating with the clamp's brackets and an opening in a rest wall for the lead screw. The outer surfaces of the wedge and the inner surfaces of the body and the clamp converge downward at the same angle.

25 The inclination of the walls of the body and the clamp and the walls of the wedge is $10 \div 50$ degrees, and preferably 30 degrees.

30 The opening in the rest wall for the lead screw is preferably elongated oval in shape.

35 Inner walls of the body and the clamp comprise vertical recesses to accommodate the screw.

40 Additionally, the apparatus comprises a cover connected in a sliding manner to the clamp, intended for extending the working range of the apparatus.

45 Optionally, the apparatus additionally comprises an intermediate wedge positioned between the body and the clamp. Its outer and inner walls converge downwards at the same angle as the outer walls of the main wedge.

[0008] The device according to the present invention offers a simple solution that makes window installation significantly easier. The device is reliable and easy to

operate. The use of three (and preferably four) such devices makes it possible to fit a window in the window opening in a short time, even by one person only.

[0009] The subject of the invention is presented in two embodiments in a schematic drawing, where Fig. 1 is an expanded view of the window installation apparatus in its first embodiment (perspective view), Fig. 2 - window installation apparatus in its first embodiment (front view), Fig. 3 - the same apparatus (perspective view), Fig. 4 - body of the apparatus (front view, as seen from the clamp), Fig. 5 - axial section of the body, Fig. 6 - clamp (front view, as seen from the body), Fig. 7 - clamp (bottom view), Fig. 8 - expanded view of the window installation apparatus in its second embodiment (perspective view), Fig. 9 - window installation apparatus in its second embodiment (front view), Fig. 10 - the same apparatus (perspective view).

[0010] The first embodiment of the window installation apparatus according to the invention has been used for the installation of a PVC window. Four such devices were used.

[0011] Each device was made of a plastic material technically known as POM (polyacetal), considered to be one of the most rigid and robust thermoplastics.

The window installation apparatus comprises a body 1 intended for quick installation outside a PVC window frame (not shown in the drawing) near its corners by means of protrusions 2 extending from the body 1. The protrusions 2, positioned on opposite sides of the body 1, lock in a rail (not shown in the drawing) positioned outside the window frame.

The body 1 interacts with a clamp 3, connected in a sliding manner to the body 1 by means of brackets 4 of the clamp 3 and the rail 5 formed out of the sides of the body 1. Furthermore, the apparatus comprises an expansion unit consisting of a wedge 6 positioned between the body 1 and the clamp 3.

Outer walls 7 of the wedge 6 converge downwards at an angle of 30 degrees. Likewise, inner walls 8 of the body 1 and the movable clamp 3 (facing the wedge 6) incline at an angle of 30 degrees. Furthermore, the apparatus comprises a steel lead screw 9.

The lead screw 9 is positioned in the body 1, in an oval opening 10 made in a rest wall 11, against which its head rests from the bottom. The other end of the lead screw 9 is threaded into an opening 12 in the wedge 6. Inner walls 8 of the body 1 and the clamp 3 comprise vertical recesses 13 to accommodate the screw 9.

Driving the lead screw 9 into the wedge 6 pulls the wedge 6 towards the body 1, as a result of which the walls 7 of the wedge 6 press against the inner walls 8 of the body 1 and the clamp 3. The interaction of the inclined elements 7 and 8 of the apparatus pushes the clamp 3 outwards, thus expanding the apparatus.

In the case of one of the four devices used according to the invention, the installer found that the expansion range was insufficient because the gap between the window and the wall was too wide. Therefore, he used an addi-

tional element in the form of a cover 14 for the clamp 3. The two elements are connected in a sliding manner by means of brackets 15 of the cover that mate with side rails 16 of the clamp 3.

5 [0012] In the second embodiment, in order to increase the working range of the clamp 3, the expansion unit has been additionally fitted with an intermediate wedge 17, positioned between the main wedge 6 and the body 1 and the clamp 3, whose outer walls 18 and inner walls 18' converge downwards at the same angle as the walls 8 of the main wedge 6, i.e. at an angle of 30 degrees.

10 Driving the lead screw 9 into the wedge 6 pulls the wedge 6 towards the body 1, as a result of which the walls 7 of the wedge 6 press against the inner walls 18' of the intermediate wedge 17, which in its turn acts (via its outer walls 18) on the inner walls 8 of the body 1 and the clamp 3. The interaction of the inclined elements 7, 18', 18 and 8 of the apparatus pushes the clamp 3 outwards, thus expanding the apparatus

15 20 [0013] By using the devices according to the invention a single operator easily fitted and immobilized the window frame in a correct position in the window opening before its final installation by means of expanding foam.

25 -List of reference

[0014]

- | | |
|-------|--|
| 1 | - body |
| 30 2 | - protrusion of the body |
| 3 | - clamp |
| 4 | - clamp bracket |
| 5 | - rail |
| 6 | - wedge |
| 35 7 | - outer wall of the wedge |
| 8 | - inner wall of the body and the clamp |
| 9 | - lead screw |
| 10 | - rest wall opening |
| 11 | - rest wall |
| 40 12 | - wedge opening |
| 13 | - recess |
| 14 | - cover |
| 15 | - cover bracket |
| 16 | - side rail |
| 45 17 | - intermediate wedge |
| 18 | - outer wall of the intermediate wedge |
| 18' | - inner wall of the intermediate wedge |

50 Claims

1. A window installation apparatus comprising at least one wedge-shaped distance piece **characterized in that it** has a body (1) connected in a sliding manner to a clamp (3), between which an expansion unit is positioned, comprising a wedge (6) and a lead screw (9) connected by means of a threaded connection with an opening (12) of the wedge (6), wherein the

body (1) has protrusions (2) positioned at its opposite sides, lateral rails (5) mating with brackets (4) of the clamp (3) and an opening (10) in a rest wall (11) for the lead screw (9), while the outer walls (7) of the wedge (6) and the inner walls (8) of the body (1) and the clamp (3) converge downward at the same angle. 5

2. The apparatus according to the claim 1 **characterized in that** the inclination angle of the walls (8) of the body (1) and the clamp (3) and the walls (7) of the wedge (6) is 10 ÷ 50 degrees, and preferably 30 degrees. 10
3. The apparatus according to the claim 1 **characterized in that** the opening (10) in the rest wall (11) accommodating the lead screw (9) is preferably elongated oval in shape. 15
4. The apparatus according to the claim 1 **characterized in that** the inner walls (8) of the body (1) and the clamp (3) comprise vertical recesses (13) to accommodate the screw (9). 20
5. The apparatus according to the claim 1 **characterized in that** it additionally comprises a cover (14) connected in a sliding manner to the clamp (3). 25
6. The apparatus according to the claims 1 or 2 or 3 or 4 or 5 **characterized in that** it additionally comprises an intermediate wedge (17) positioned between the body (1) and the clamp (3), whose outer walls (18) and inner walls (18') converge downwards at the same angle as the outer walls (8) of the main wedge (6). 30

35

40

45

50

55

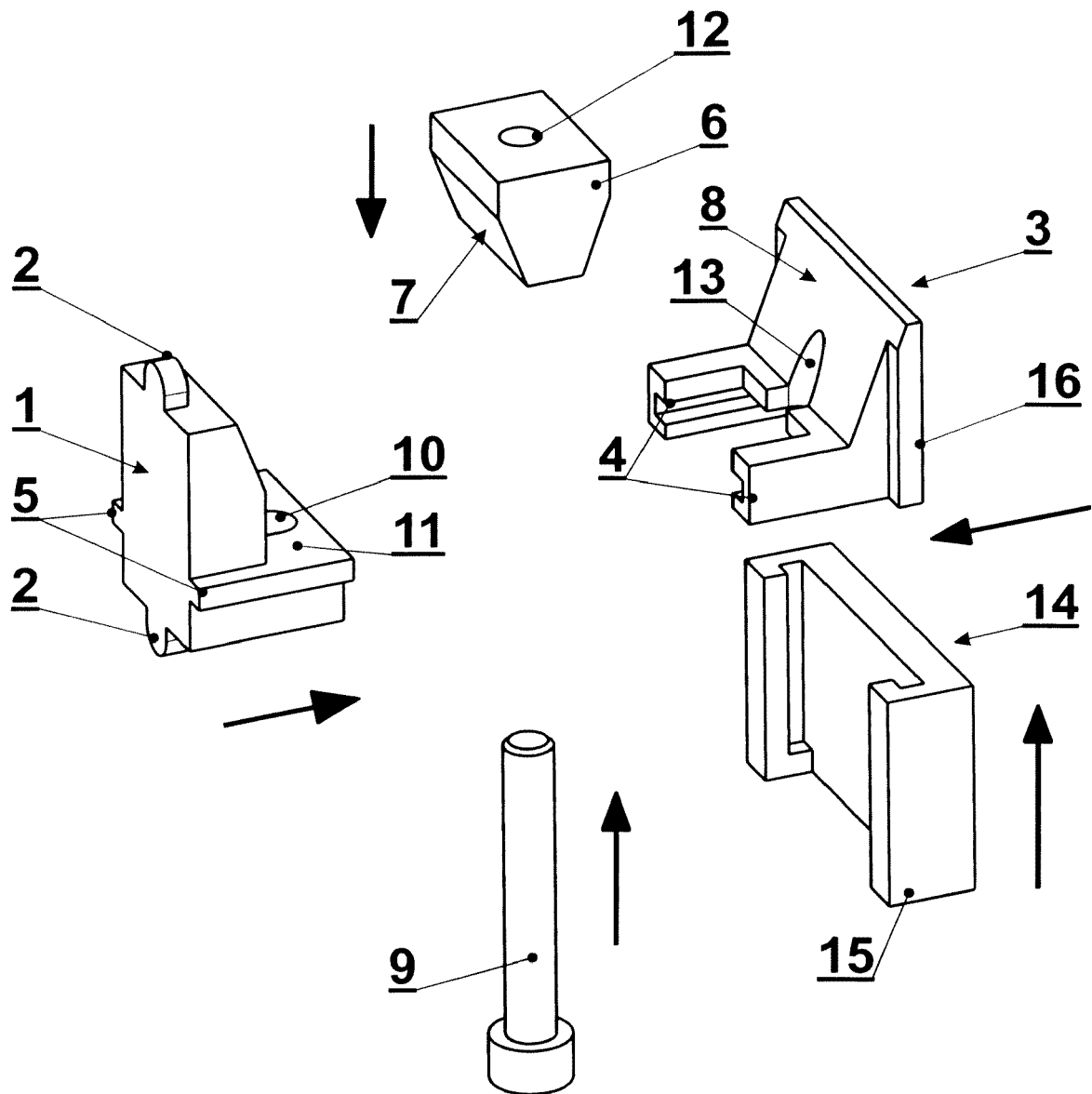
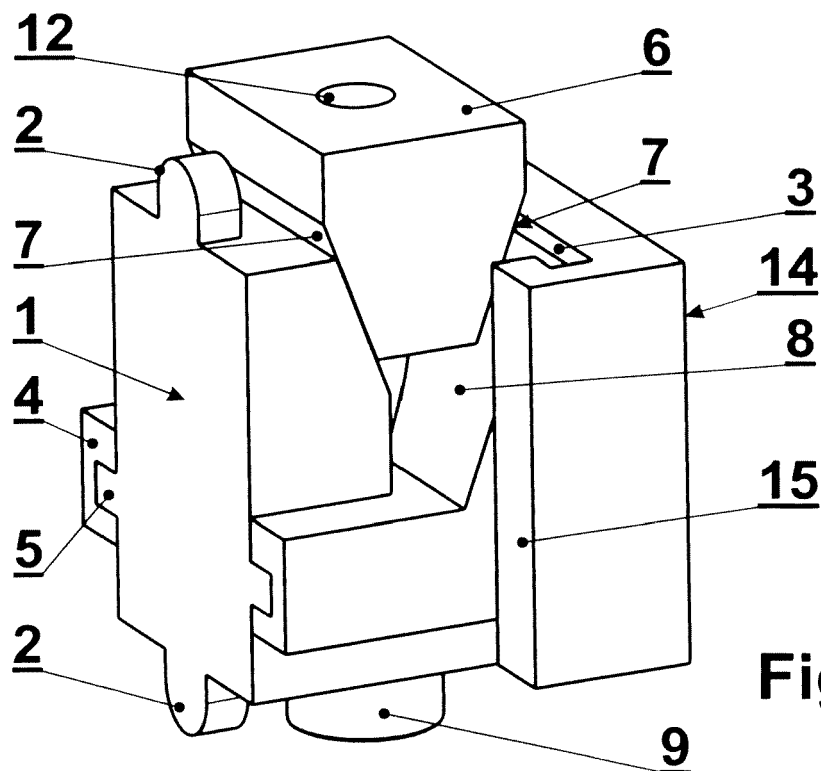
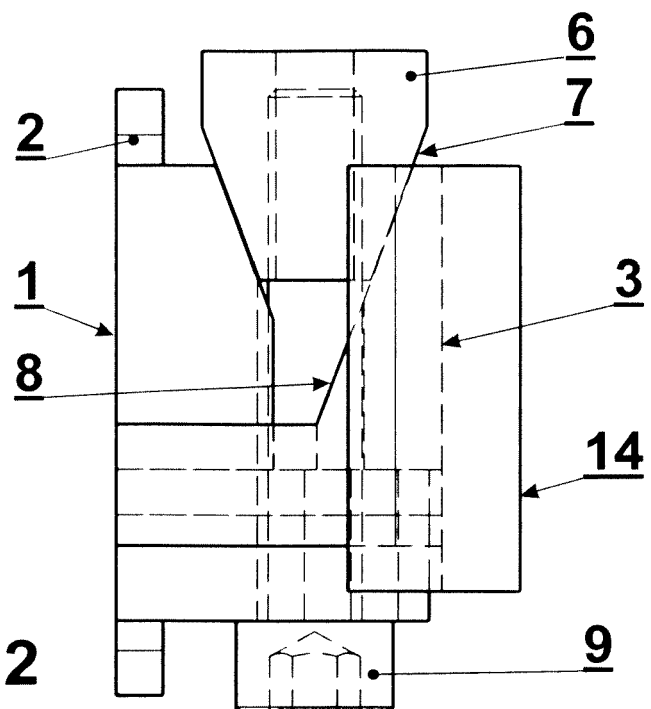


Fig. 1



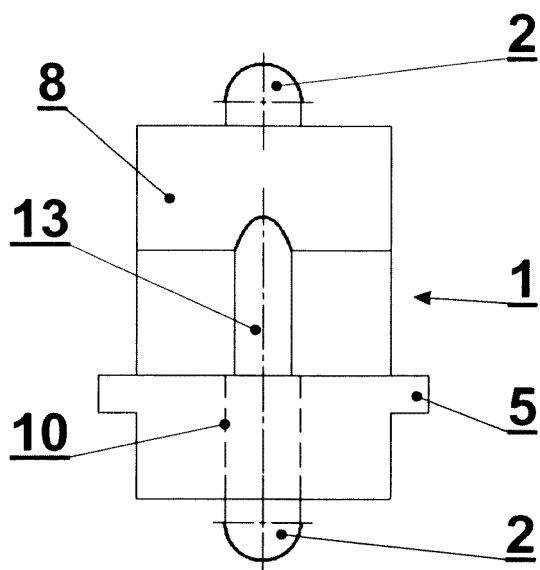


Fig. 4

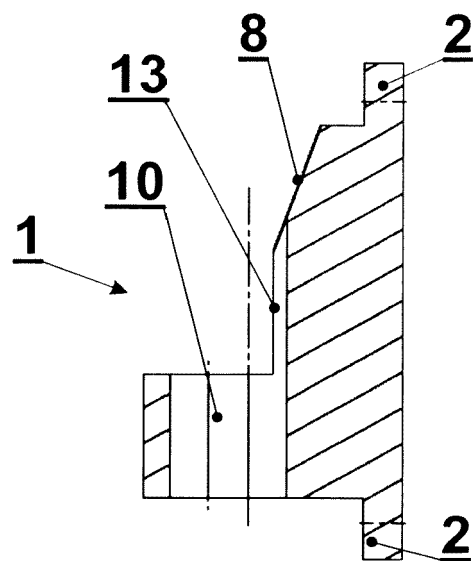


Fig. 5

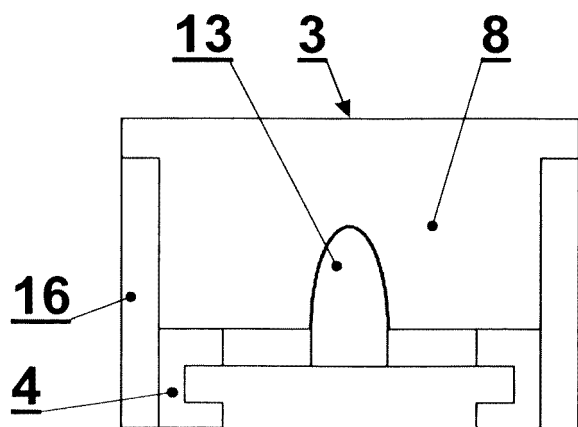


Fig. 6

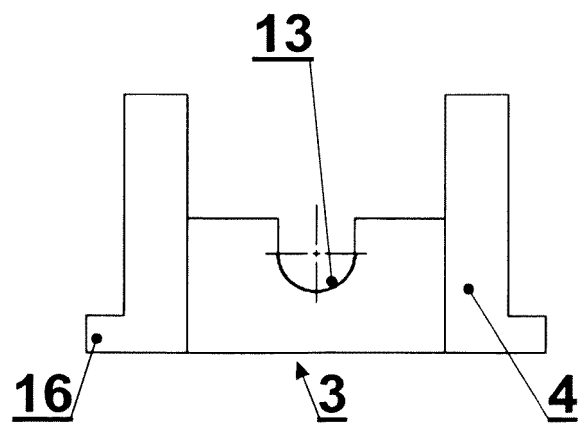


Fig. 7

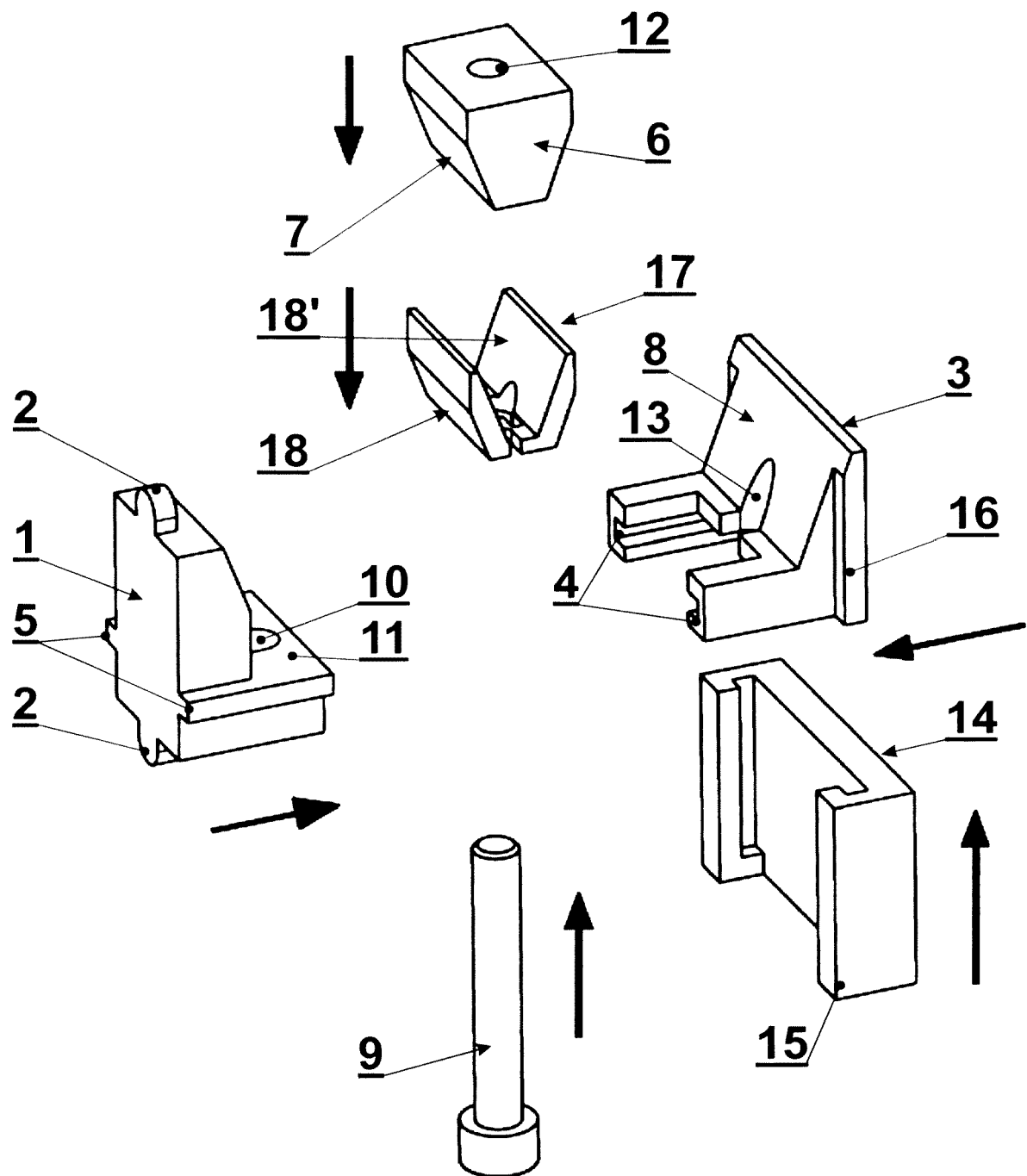


Fig. 8

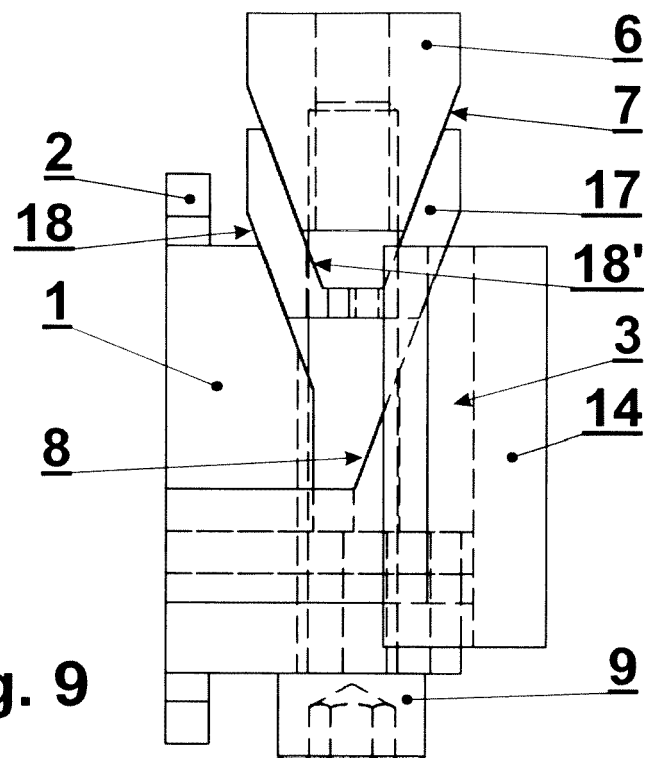


Fig. 9

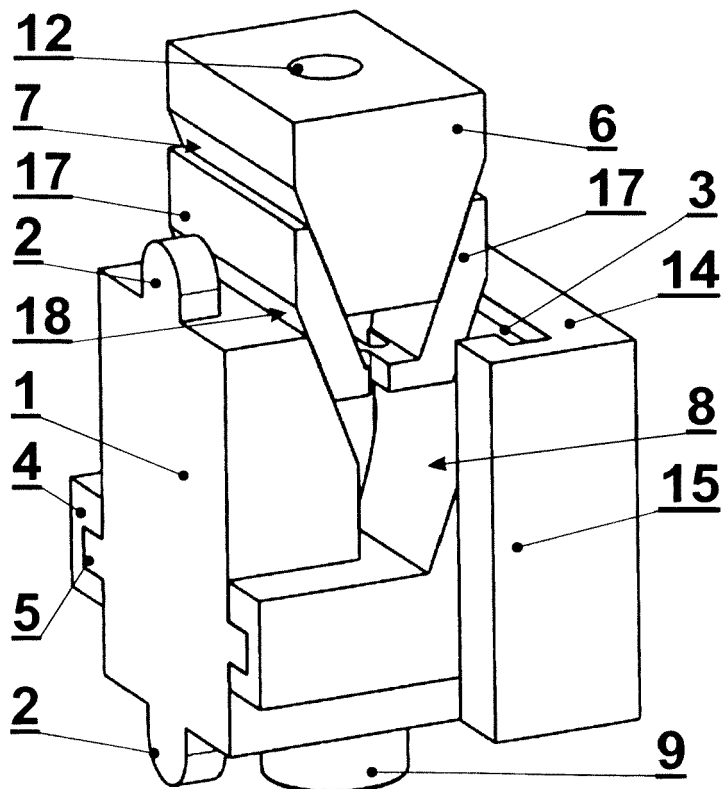


Fig. 10



EUROPEAN SEARCH REPORT

Application Number
EP 16 46 0082

5

10

15

20

25

30

35

40

45

50

55

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	DD 53 392 A (FRITZ WUNDERLICH) 20 January 1967 (1967-01-20) * figure 1 *	1-6	INV. E06B1/60 E04F21/00
A	WO 2015/066743 A1 (GKP GMBH [AT]) 14 May 2015 (2015-05-14) * figures 2, 10, 11 *	1	
A	US 5 427 349 A (OBRECHT ROBERT E [US]) 27 June 1995 (1995-06-27) * figure 4 *	1	
A	DE 10 2007 006087 A1 (CAE CONSULTING & ENGINEERING G [DE]) 14 August 2008 (2008-08-14) * figures 1-7 *	1	
A	DE 195 26 203 A1 (AXMANN FRANZ [DE]) 7 December 1995 (1995-12-07) * figure 1 *	1	
			TECHNICAL FIELDS SEARCHED (IPC)
			E06B E04F
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 7 February 2017	Examiner Crespo Vallejo, D
CATEGORY OF CITED DOCUMENTS 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		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	

EPO FORM 1503 03.82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 16 46 0082

5

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

07-02-2017

10

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
DD 53392 A	20-01-1967	NONE	
WO 2015066743 A1	14-05-2015	AT 515020 A1 DE 112014005073 A5 WO 2015066743 A1	15-05-2015 04-08-2016 14-05-2015
US 5427349 A	27-06-1995	US RE35907 E US 5427349 A	29-09-1998 27-06-1995
DE 102007006087 A1	14-08-2008	NONE	
DE 19526203 A1	07-12-1995	NONE	

15

20

25

30

35

40

45

50

55

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- PL 107340 U1 [0003]
- WO 2005068749 A1 [0004]
- WO 2005102609 A1 [0005]
- GB 2413352 B [0005]