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(54) **Self-centering vise**

(57) Self-centering vise consists of three main modules, i.e. left and right clamping jaw and self-centering compensating module, where power transmission takes place via square wrench and additional self-centering compensating module. Drive of the jaw movement is per-

pendicular to the movement direction of jaw clamping / unclamping. A minimum of two independent modules are driven by centrally applied torque. The swiveling jaw inserts allow vertical adjustment of the clamping surface to the clamped workpiece.

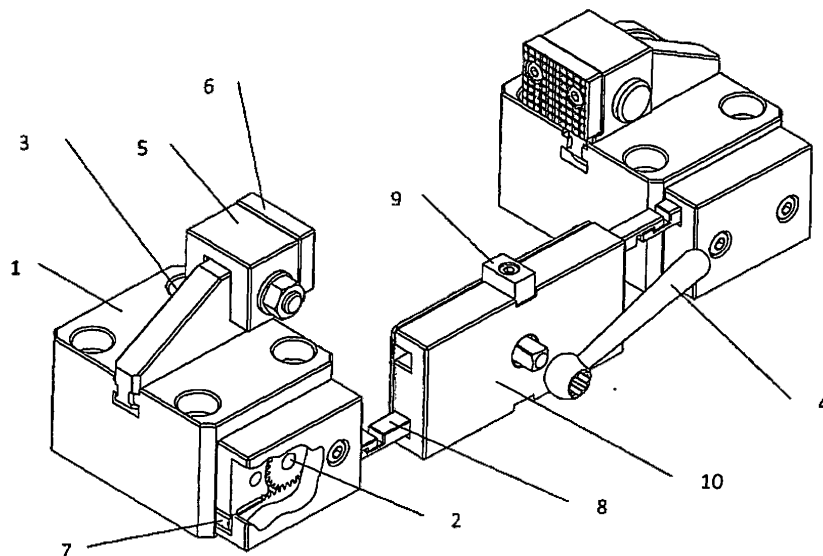


Figure.

## Description

[0001] The subject invention is a self-centering vise designed for clamping workpieces with large dimensions and high cutting forces, for workpieces exposed to deformations, clamping logs, clamping workpieces with trapezoidal and rectangular cross-sections, of existing symmetry surface.

[0002] There are known self-centering vises, where power transmission is obtained by a turnbuckle, which rotary movement causes clamping/unclamping of the workpiece in a direction parallel to the axis of the turnbuckle. The control of clamping/unclamping is actuated with one square or hexagonal wrench at one of two ends of the turnbuckle. The advantage of this solution is a rigid design and ability to maintain high precision clamping. The disadvantage of this solution is a construction with a joint body for both jaws, which significantly reduces the clamping range of the vise, and its increase requires to create of a new design of substantial component parts (including body, and thus the largest part of the vise).

[0003] There are known modular vises, where clamping of the workpiece takes place at each pair of modules, equipped with a movable jaw, sliding T-handle screw or with additional knob/wrench. The rotary movement of the screw causes a linear traverse of the jaw along the guide, parallel to the screw axis. The modules in this solution are completely independent. The only possibility of their connection is a rigid link between their positions relative to each other. The advantage of this solution is the ability to obtain a substantial clamping range. The necessary condition to maintain the shape of the workpiece is a prior preparation of its shape. Otherwise, it may cause deformation of the long workpiece. The modular vises of this type can work in multi-units, however they are limited by the need of implementation of the joint base, and the principle of operation unable to link them to work simultaneously.

[0004] There are known modular vises, where clamping of the workpiece is divided into two phases - setting movement, obtained by moving the jaw manually along the guide body, and clamping movement, caused by the axial movement of the screw, which at the time of clamping is set in axis parallel to the direction of the jaw movement. According to this principle of operation it is not possible to link the clamping movements of the individual modules. There is also no possibility of self-centering or compensating clamping. The advantage of this solution is relatively high clamping repeatability and low time-consumption because of rapid idle stroke.

[0005] The matter of invention is a self-centering modular vise, where power transmission takes place via square wrench and additional self-centering compensating module. Drive of the jaw movement is perpendicular to the movement direction of jaw clamping/unclamping. A minimum of two independent modules are driven via centrally applied torque. The swiveling jaw inserts allow for vertical adjustment of the clamping surface to the

clamped workpiece.

[0006] The advantage of the solution according to invention is a compact design that allows clamping in prisms without receiving degrees of freedom (compensation), while maintaining the position of the symmetry surface. Further advantages are: high clamping force obtained via gear drive ratio unit, self-locking drive unit that allows for wrench and self-centering module removal without force loss, possibility of simple extension of the system and increase of the clamping range and interchangeable jaws inserts that allow to adapt to specific shapes, including shaft-type components (without support) in prism inserts.

[0007] The subject of invention is shown in figure.

[0008] The components of a self-centering vise consist of: clamping jaw module 1, gear drive ratio unit 2, solid jaw 3, square wrench 4, swiveling jaw insert 5, interchangeable jaw insert 6, tension bar 7, drawbar 8, locking slot 9 and self-centering compensating module 10.

[0009] Torque from the square wrench on the linear gear, is transmitted to the toothed gear that cooperates with toothed bar, so-called gear rack. The rotary movement of the pinion is converted into sliding movement transmitted via gear rack carried out in leading channels, beyond self-centering compensating module, where via made hooks the force is transmitted linearly to tension bars, connected on the toothed side with pinions in the left and right clamping jaws. The jaws are an integral multi-unit parts of the gear drive ratio, that convert rotary movement of the pinion to linear movement of the solid jaws, directed towards the opposite jaw. The movement takes place until the maximum clamping force is obtained. The swinging insert ensures proper jaw alignment to the shape of the workpiece side walls. When using locking slot, the workpiece is clamped once it is set in driving axis on the symmetry surface of the clamped workpiece. When locking slot is removed the clamping takes place with compensation movement of the jaw, which as a first grips the workpiece. After clamping of the workpiece in clamping jaws the wrench movement in the direction opposite to clamping direction within a few degrees releases compensating self-centering module, that can be postponed. The force is maintained by self-locking drive multi-units. The wrench movement in a range of above-mentioned several degrees in direction opposite to clamping direction causes unclamping of the workpiece, and then outward moving of the jaws.

## Claims

1. Self-centering vice is **characterized by** three main modules i.e. left and right clamping jaw and self-centering compensating module, where power transmission takes place via square wrench and additional self-centering compensating module.
2. Self-centering vice according to claim 1 is **charac-**

**terized by** drive of the jaw movement which is perpendicular to the movement direction of jaw clamping / unclamping.

3. Self-centering vice according to claim 2 is **characterized by** minimum of two independent modules which are driven via centrally applied torque. 5
4. Self-centering vice according to claim 3 is **characterized by** swiveling jaw inserts, which allow vertical adjustment of the clamping surface to the clamped workpiece. 10

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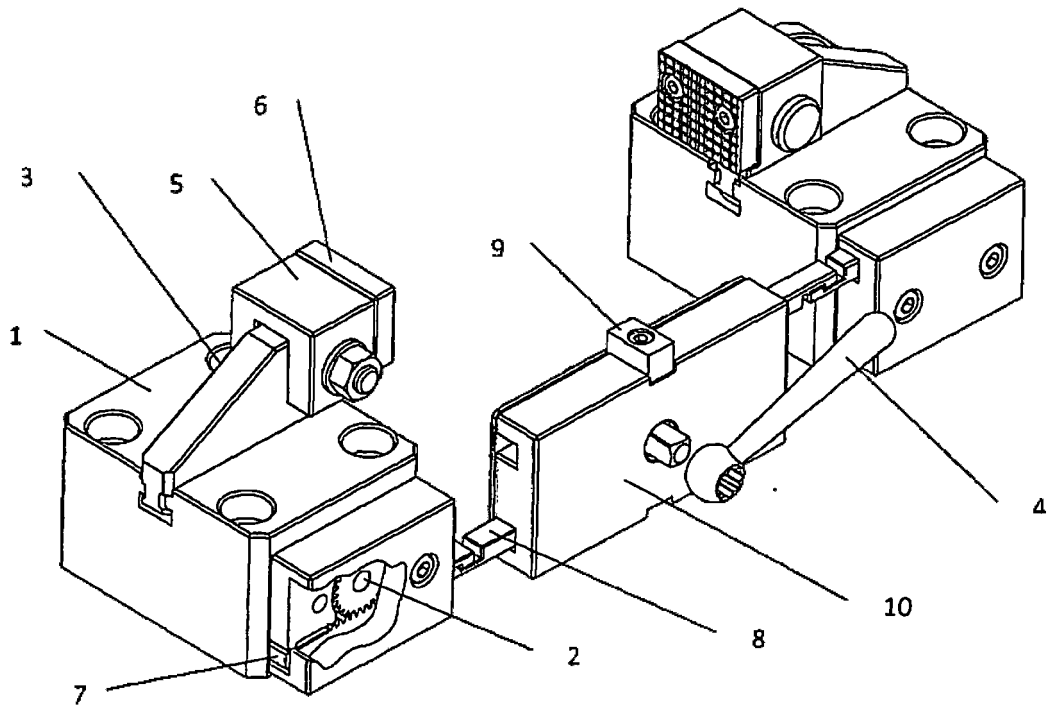


Figure.



EUROPEAN SEARCH REPORT

Application Number  
EP 14 46 0055

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DOCUMENTS CONSIDERED TO BE RELEVANT				
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)	
X	DE 203 19 326 U1 (KRAEMER FRANZ [DE]) 4 March 2004 (2004-03-04)	1-3	INV. B25B1/06 B25B1/20 B25B5/14	
Y	* paragraph [0023] - paragraph [0025]; figures *	4		
A	WO 95/07790 A1 (BINZEL ALEXANDER GMBH CO KG [DE]; SPERLING HERMANN [DE]) 23 March 1995 (1995-03-23) * page 7, line 7 - page 8, line 20; figures 1,4 * * page 9, line 29 - page 10, line 7 *	1,2		
A	CA 2 218 162 A1 (GLOW HARRY G [CA]) 14 April 1999 (1999-04-14) * page 5, line 14 - page 6, line 18; figures *	1-3		
A	DE 35 32 028 A1 (PUNKT AUTOMATIONSTECHNIK GMBH [DE]) 19 March 1987 (1987-03-19) * column 3, line 31 - column 4, line 31; figures *	1,2		
A	DE 10 2011 057099 B3 (RATTUNDE & CO GMBH [DE]) 4 April 2013 (2013-04-04) * paragraph [0025] - paragraph [0032]; figures *	1		TECHNICAL FIELDS SEARCHED (IPC)
Y	EP 0 104 286 A1 (YANG TAI HER) 4 April 1984 (1984-04-04) * page 12, line 5 - line 11; figure 10 *	4		B25B
A	US 4 632 375 A (YANG TAI-HER [TW]) 30 December 1986 (1986-12-30) * figures 40,49,62,63 *	4		
The present search report has been drawn up for all claims				
Place of search The Hague		Date of completion of the search 24 February 2015		Examiner Majerus, Hubert
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 03.02 (P04C01)

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

EP 14 46 0055

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  
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24-02-2015

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
DE 20319326 U1	04-03-2004	DE 20319326 U1 IT MI20040552 U1	04-03-2004 10-03-2005
WO 9507790 A1	23-03-1995	CN 1137767 A EP 0719198 A1 JP H09504476 A US 5837967 A WO 9507790 A1	11-12-1996 03-07-1996 06-05-1997 17-11-1998 23-03-1995
CA 2218162 A1	14-04-1999	NONE	
DE 3532028 A1	19-03-1987	NONE	
DE 102011057099 B3	04-04-2013	CA 2860194 A1 DE 102011057099 B3 EP 2797719 A1 US 2014374977 A1 WO 2013098388 A1	04-07-2013 04-04-2013 05-11-2014 25-12-2014 04-07-2013
EP 0104286 A1	04-04-1984	AT 70486 T AU 577029 B2 AU 1964983 A CA 1219607 A1 DE 3280383 D1 EP 0104286 A1 IN 160932 A1 ZA 8307248 A	15-01-1992 15-09-1988 05-04-1984 24-03-1987 30-01-1992 04-04-1984 15-08-1987 28-11-1984
US 4632375 A	30-12-1986	NONE	