



(12) **EUROPEAN PATENT APPLICATION**
published in accordance with Art. 158(3) EPC

(43) Date of publication:
22.08.2007 Bulletin 2007/34

(51) Int Cl.:
B27C 1/10 (2006.01)

(21) Application number: **05818120.7**

(86) International application number:
PCT/RU2005/000555

(22) Date of filing: **10.11.2005**

(87) International publication number:
WO 2006/062439 (15.06.2006 Gazette 2006/24)

(84) Designated Contracting States:
DE LV

(30) Priority: **26.11.2004 RU 2004134489**

(71) Applicants:
• **Ponomarev, Lev Alexandrovich**
Khimki, Moskovskaya obl. 141400 (RU)
• **Medovolkina, Viacheslav Ivanovich**
Reutov, Moskovskaya obl. 143952 (RU)

(72) Inventors:
• **Ponomarev, Lev Alexandrovich**
Khimki, Moskovskaya obl. 141400 (RU)
• **Medovolkina, Viacheslav Ivanovich**
Reutov, Moskovskaya obl. 143952 (RU)

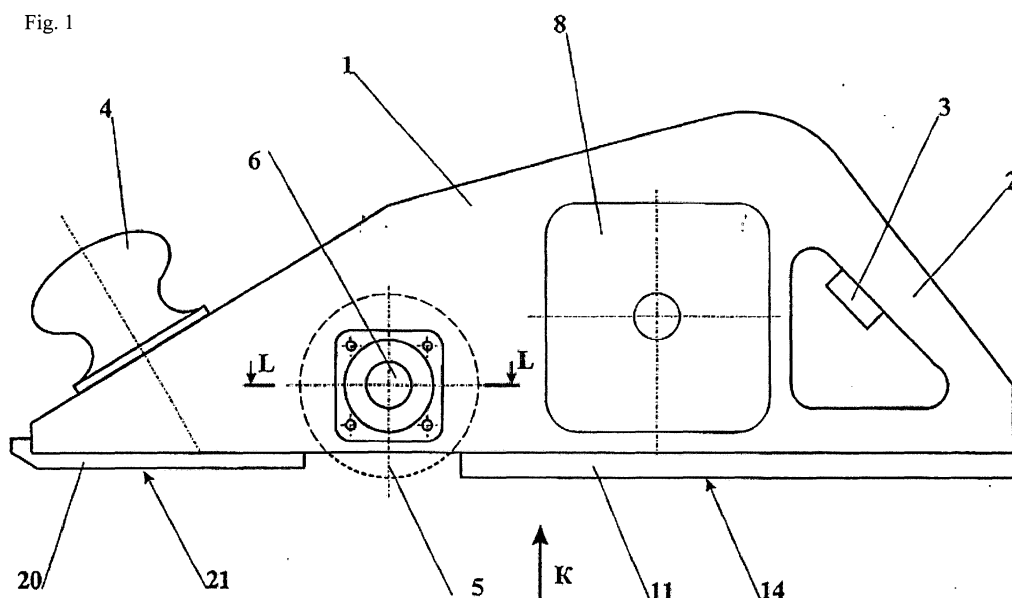
(74) Representative: **Djukic, Dusan**
Mark-Inventa Co., Ltd.
P.O.Box 3916
1001 Ljubljana (SI)

(54) **MECHANICAL PLANE**

(57) Concept of invention: a power-operated plane comprises a body portion, a cutting head and a rear support assembly. The cutting head is mounted in the interior space of the body portion with freedom to be rotated on bearing assemblies. The cutting head comprises at least two drive-shaft-supported face-and-side cutters. The rear support assembly is in the form of at least two shoes arranged parallel to the longitudinally extending symmetry axis of the body portion and coupled with the body portion by means of a detachable joint. Said shoes are

mounted with a faculty of pitch transposition edgewise of the body portion. The cutting head has the ability to move relative to the body portion in a vertical plane and to be located in intermediate position. The body portion has two symmetrically arranged and open-bottom grooves for receiving the corresponding bearing assemblies of the cutting head. The length of each groove about its longitudinal symmetry axis is not less than 0.3 and not more than 0.9 diameter of the face-and-side cutter. 7 dep. claims; 7 ill.

Fig. 1



Description

[0001] The invention relates to wood working industry, specifically manual power-operated planes and can be used in treating surfaces for planing and shaping wooden parts.

[0002] Known in the art is a power-operated plane comprising a body portion with two symmetrically extending and open-bottom grooves and a cutting head disposed in the interior space of said body portion for rotation on bearing assemblies, said cutting head having freedom to move relative to the body portion in a vertical plane and to be clamped in intermediate position (cf. RF Patent 2236346, cl. B 27 C 1/10, published 20.09.2004).

[0003] A prior art construction is disadvantageous in the impossibility to form shaped surfaces on treatable material, which fact somewhat limits a field of use of a power-operated plane. Besides, while making a rectangular groove in said treatable material it is not possible in principle to maintain the parallelism of the side walls of the groove over the entire length thereof. Said circumstance is attributable to the fact that because of vibration there occurs a deviation of the cutting head of said power-operated plane from the rated axis of said groove. So the defects of the known construction may be the impossibility to maintain the straightness of direction of movement of the power-operated plane at the time of forming the grooves on long-measuring surfaces to be treated.

[0004] The closest as to technical essence and attainable technical result is a power-operated plane comprising a body portion, a cutting head disposed in the interior space of said body portion for rotation with at least a pair of drive-shaft-mounted face - and- side cutters, and a rear support assembly in the form of at least two shoes arranged in parallel relation to the longitudinally extending symmetry axis of said body portion, which are connected to the said body portion thru a releasable connection and which are mounted with a faculty of pitch transposition edgewise of said body portion (cf. RF Patent 2231441, cl. B 27 C 1/10, published 27.06. 2004).

[0005] The prior art technical solution partially removes the defects of the above-described analogue as making possible straightness of movement of a power-operated plane when treating long- measuring surfaces. However, after a certain period of operation, the cutting edges of face-and-side cutters of a cutting head wear out on interaction thereof with destructible material. For the predetermined characteristics of the power -operated plane to be restored, the face-and-side cutters require a regrinding of the cutting edges thereof. Regrinding of the cutting head causes reduction of an initial diameter of the latter, which fact makes it impossible to carry out, after the regrinding, the planing or shaping operations of treatable material for a full depth. The disadvantages of the prior art construction may be the impossibility to maintain a specified depth of planing during the entire period of operation, which fact leads to reducing the service life of the power- operated plane.

[0006] The invention is directed to solving a task of creating a power-operated plane that provides for expanding a field of its use owing to the possibility to implement shaped surfaces differing in configuration while simultaneously maintaining the specified technical data during operation thereof. The technical result that can be obtained in realization of the invention resides in extending the service life of the power-operated plane in making the shaped surfaces of variable configuration.

[0007] The task set is solved owing to the fact that in a power-operated plane comprising a body portion, a cutting head mounted for rotation in the interior space of said body portion with at least two drive-shaft-mounted face-and-side cutters, and a rear support assembly in the form of at least two shoes arranged parallel to the longitudinally extending symmetry axis of the body portion, which are connected to said body portion thru a releasable connection and which are mounted with a faculty of pitch transposition edgewise of the body portion; said cutting head is mounted with freedom to move relative to the body portion in a vertical plane and to be clamped in intermediate position, and the body portion is implemented with two symmetrically extending and open-bottom grooves for placing the corresponding bearing assemblies of the cutting head and the length of each groove about its longitudinal axis of symmetry is not less than 0.3 and not more than 0.9 diameter of the face-and-side cutter.

[0008] Besides, the task set is solved owing to the fact that a power-operated plane has means for displacing the bearing assemblies of a cutting head.

[0009] Besides, the task set is solved owing to the fact that means for displacing the bearing assemblies of a cutting head is configured as a screw mechanism.

[0010] Besides, the task set is solved owing to the fact that a power-operated plane has some locks for locating the bearing assemblies of a cutting head with respect to a body portion.

[0011] Besides, the task set is solved owing to the fact that a power-operated plane is provided with a front support assembly.

[0012] Besides, the task set is solved owing to the fact that the longitudinally extending symmetry axes of grooves are arranged in a vertical plane.

[0013] Besides, the task set is solved owing to the fact that the longitudinally extending symmetry axes of grooves are arranged at a sharp angle to a horizontal plane passing thru the longitudinally extending symmetry axis of a body portion.

[0014] Besides, the task set is solved owing to the fact that an angle of slope of the longitudinally extending symmetry axes of grooves to a horizontal plane passing thru the longitudinally extending symmetry axis of a body portion is not less than 60°.

[0015] Essence of the invention is described in detail with reference to the drawings, wherein Fig. 1 shows a power-operated plane; Fig. 2 - view along arrow A in Fig. 1; Fig. 3 - cutting head of a power-operated plane; Fig.

4 - section along H-H in Fig. 3; Fig. 5 - section along L-L in Fig. 1; Fig. 6 - variant of a diagram of a shaped surface formed on treatable material with three shoes of a rear support assembly, and Fig. 7 - variant of connection of the shoe of a rear support assembly with the body portion of a power-operated plane.

[0016] A power-operated plane comprises a body portion I with a rear handle 2 accommodating an actuating mechanism (not shown) with a cock 3, and with a front handle 4. Body portion 1 has a space for placing a cutting head 5 carried by a drive shaft 6 with freedom to rotate about a longitudinally extending symmetry axis 7 and securely fastened on the drive shaft 6 by means of a device. The device for clamping the cutting head 5 on the drive shaft 6 can be configured as any known releasable connection, for example a bayonet or splined joint. Drive shaft 6 is kinematically coupled with a motor 8 placed in the interior space of the body portion I. Motor 8 used can be represented by any known motor, for example an electric or compressed air motor. The kinematic connection of the motor 8 with the drive shaft 6 can be in the form of, for example, a belt drive (not shown). Cutting head 5 (Fig. 3) is in the form of at least two face-and-side cutters 9 mounted on the drive shaft 6. Each and every face-and-side cutter 9 may have one or more of cutters with a cutting edge 10. With implementation of the face-and-side cutter 9 having two and more cutters their symmetrical arrangement is preferred with the displacement of the cutting edges 10 of adjacent cutters by an equal angle. The number of face-and-side cutters 9 depends on treatment width and should be not less than 2. The power-operated plane comprises a rear support assembly in the form of at least two shoes 11 and 12, each one being parallel to a longitudinally extending symmetry axis 13 of the body portion I and having a rear supporting surface 14 for cooperation with treatable material 15. Each said shoe is connected to the body portion I via a releasable connection (Figs. 2 and 7) configured as, for example, threaded holes 16 in the body portion I and bolts 18 arranged in through holes 17 of the shoes 11, 12. Through holes 17 in the shoes 11 and 12 have seats for placing bolt 18 heads. Shoes 11 and 12 are mounted with a faculty of pitch transposition edgewise of the body portion I, or to be more exact, the possibility is provided for each shoe 11 or 12 releasably connected to the body portion I while displacing it at a predetermined distance (A) edgewise of the body portion I what is a pitch of transposition, for which purpose there can be made additional threaded holes 19 edgewise of the body portion I at a predetermined distance (A) from each other to arrange the threaded portions of the respective bolts 18. Width (B) of each shoe 11 and 12 about the longitudinal symmetry axis 7 of the cutting head 5 does not exceed a width (C) of the face-and-side cutter 9 of the cutting head 5 about the same axis 7 (Fig. 2) or the following condition is satisfied: $B \leq C$. The longitudinally extending symmetry axis of each shoe 11 and 12 is arranged in a vertical plane being drawn across the transverse symmetry axis of the respective

face-and-side cutter 9 of the cutting head 5, or to be more exact, the longitudinal symmetry axis of said shoe 11 or 12 and the transverse symmetry axis of the respective face-and-side cutter 9 are disposed in one plane. On the body portion I there can be installed a front support assembly 20 with a faculty of restricted movement and location in intermediate position, said assembly having a forward supporting surface 21 for interaction with the material 15 to be treated. Said front support assembly 20 can be kinematically coupled with the front handle 4 such that rotation of said front handle 4 is transformed into reciprocation of the front support assembly 20. Said kinematic relationship of the front support assembly 20 with the front handle 4 can be accomplished with the use of any known mechanism (not shown) for transforming the rotary motion of its input unit into the forward motion of its output unit. Cutting head 5 is mounted for rotation relative to the body portion 1 on bearing assemblies 22 and each and every bearing assembly 22 comprises at least one roller bearing and a body portion 23. Cutting head 5 is mounted with freedom to move relative to the body portion I of the power-operated plane in a vertical plane and to be located in intermediate position. Body portion I of the power-operated plane has two symmetrically arranged and open-bottom grooves 24 for disposing body portions 23 of the respective bearing assemblies 22 of the cutting head 5 (Fig. 4). Grooves 24 in the body portion 1 of the power-operated plane can be provided with guiding elements (not shown) intended for carrying out the directed movement of the cutting head 5 in the vertical plane. Said guiding elements can be made in the form of, for example separate parts attached by a detachable joint to the side surfaces of grooves 24 or implemented as a common part with the body portion I of the power-operated plane, say, in the form of lips 25 for cooperation with the body portions 23 of the respective bearing assemblies 22. Said power-operated plane can be provided with means (not shown) for making up for a changed position in space of the motor 8 and the cutting head 5. Said means is intended for maintaining the kinematic relationship between the outgoing shaft of the motor 8 and the drive shaft 6 of the cutting head 5 with a change in the spatial position of the cutting head 5 and the motor 8 and can be made in the form of, for example a spring-loaded tension roller mounted for interaction with a run of the belt drive. Length (E) of each groove 24 about its longitudinal symmetry axis 26 is not less than 0.3 and not more than 0.9 diameter (D) of the face-and-side cutter 9 of the cutting head 5 (Fig. 4), i.e. on the condition that $0.3D \leq E \leq 0.9D$. Said ratio of the geometrical characteristics of said elements of the power-operated plane has been obtained empirically and determines the most favourable ratio between the vibration-related permissible deviation of the cutting head 5 of the power-operated plane and the greatest possible wearing value of the face-and-side cutters 9 of the cutting head 5.

[0017] A power-operated plane can be provided with means for moving the bearing assemblies 22 of the cut-

ting head 5, which said means can be implemented in the form of, for example a rack and pinion gear (not shown), of which one unit (rack) can be disposed on the body portion I of the power-operated plane or on the body portion 23 of the bearing assembly 22 while another unit (gear wheel) - respectively on the body portion 23 of the bearing assembly 22 or on the body portion I of the power-operated plane. Said means for moving the bearing assemblies 22 of the cutting head 5 can be executed in the form of, for example an actuating cylinder (not shown), of which one unit (cylindrical body) can be disposed on the body portion I of the power-operated plane or on the body portion 23 of the bearing assembly 22 and another unit (cylinder rod) - respectively on the body portion 23 of the bearing assembly 22 or on the body portion I of the power-operated plane.

[0018] A variant of the structural embodiment of means for moving each and every bearing assembly 22 of the cutting head 5 is preferred when it is configured as a screw-type mechanism and what is more one of the units (screw) of said mechanism can be arranged on the body portion I of the power-operated plane or on the body portion 23 of the bearing assembly 22 and another unit (nut) - respectively on the body portion 23 of the bearing assembly 22 or on the body portion I of the power-operated plane. For example, the screw-type mechanism can be implemented in the form of a rotatable bolt 27 installed on the body portion I of the power-operated plane and a threaded hole 28 located on the body portion 23 of the bearing assembly 22, for receiving a threaded portion of the bolt 27 (Fig. 4). For taking up the axial loads from the cutting head 5 originating during operation, the bolt 27 can be provided with a carrier ring 29 permitting the bolt 27 to make rotation thereof but prevents its axial displacement relative to the body portion I of the power-operated plane. And the longitudinal symmetry axes of the bolt 27 and the threaded hole 28 are arranged on the longitudinally extending symmetry axis of the body portion 23 of the bearing assembly 22.

[0019] According to one of the variants of structural embodiment of a power-operated plane it can be implemented with locks for locating the bearing assemblies 22 of the cutting head 5 relative to the body portion I thereof. Each said lock can be constructed in the form of, for example a row of holes (not shown) positioned respectively on the face of the groove 24 and on the side surface of the body portion 23 of the bearing assembly 22 and pins (not shown) for location in the afore-said holes. The most preferable is variant of structural embodiment of said lock when it is constructed in the form of two anchoring elements 30 for releasably connecting the body portion I of the power-operated plane with the body portion 23 of the bearing assembly 22 (Fig. 5). In this case, said body portion 23 of said bearing assembly 22 is provided with two symmetrically located and open-top grooves 31 for accommodating the respective anchoring elements 30. The latter are mounted with freedom to move in the grooves 31 and each one can be made in the form of, for example

a bolt and a nut.

[0020] According to one of the variants of structural embodiment of a power-operated plane, the longitudinal symmetry axes 26 of grooves 24 in its body portion I can be arranged in a vertical plane (not shown), i.e. the longitudinally extending symmetry axis 26 of each groove 24 is perpendicular to a horizontal plane passing across the longitudinal symmetry axis 13 of the body portion I.

[0021] According to another variant of structural embodiment of a power-operated plane, the longitudinal symmetry axes 26 of grooves 24 in its body portion I can be arranged at an acute angle (α) to a horizontal plane (Fig. 4) passing across the longitudinally extending symmetry axis of the body portion I. With said variant of structural embodiment of the power-operated plane it is desired to have an angle (α) of inclination of the longitudinal symmetry axes 26 of grooves 24 to a horizontal plane passing across the longitudinal symmetry axis 13 of the body portion of not less than 60° .

[0022] Each shoe 11 and 12 of a rear support assembly can be provided with at least one adjusting shim 32 disposed between the corresponding shoe 11 or 12 and the body portion I of a power-operated plane (Fig. 7).

[0023] It is preferable that a distance (F) about the longitudinal symmetry axis 7 of the cutting head 5 between the outside lateral surfaces of extreme shoes 11 and 12 of a rear support assembly when mounted at a maximum distance from each other does not exceed a length (G) of the cutting head about the same axis 7 (Fig. 2), i.e. the following condition is satisfied: $F \leq G$. Said ratio of the dimensions of a device regulates the position of the side surfaces of shoes 11 and 12 of said rear support assembly relative to the surface of the material 15 to be treated.

[0024] Besides, it is advisable that a pitch (A) of rear-arrangement of the shoes 11 and 12 of a rear support assembly edgewise of the body portion I of a power-operated plane be multiple of a width (C) of the face-and-side cutter 9 of the cutting head 5 (Fig. 2), i.e. the following condition is satisfied: $A = n \times C$, wherein n is an integer.

[0025] Cutting head 5 of a power-operated plane can be implemented with insertion pieces 33 (Fig. 6) which are provided on the drive shaft 6 between the adjacent face-and-side cutters 9.

[0026] A power-operated plane is operated in the following manner.

[0027] A preliminary stage consists in that before the start of operation, face-and-side cutters 9 are mounted on a drive shaft 6 in accordance with order that conforms to the configuration of the surface of a material 15 to be treated, for which purpose a line defined by cutting edges 10 of the cutters of said face-and-side cutters 9 should be adapted to suit the surface contour of said treatable material 15 as required. The required shape of said cutting edges 10 of said cutters of said face-and-side cutters 9 is provided with a dismounted cutting head 5. And the cutting edges 10 of said cutters of said face-and-side cutters 9 on said dismounted cutting head 5 are in align-

ment and a tool-grinding machine is used for grinding the cutters of said face-and-side cutters 9 to a template whose shape is adapted to suit the surface contour of said treatable material 15. Upon grinding, the cutting edges 10 of the cutters of the face-and-side cutters 9 are returned to the initial position for restraint in said position. The cutting head 5 is then mounted on the power-operated plane. And be it noted that at the time of grinding, said cutting edges 10 can be given any shape as required, the curvilinear one included. The shape of said cutting edges 10 of said cutters can be specified even without grinding same by way of, for example mounting on the drive shaft 6, the face-and-side cutters 9, with the specified shape of said cutting edges 10 of their cutters in accordance with established order that just defines the surface contour of the treatable material 15. Also, the preliminary stage calls for adjusting depth of planing by locating at a predetermined distance, a forward supporting surface 21 of a front support assembly 20 with respect to the cutting edges 10 of the cutters of the face-and-side grooves 9 of the cutting head 5. Said adjustment is carried out by rotating a front handle 4 to the side as required. On rotation of said handle 4 there occurs the forward motion of the front support assembly 20 kinematically coupled therewith, and the forward supporting surface 21 takes up the predetermined position at different levels relative to the cutting edges 10 of the cutters of the face-and-side cutters 9 of the cutting head 5.

[0028] On completion of preparatory operations, a cock 3 is used for actuating a motor 8 which imparts rotation to the drive shaft 6 and the face-and-side cutters 9 mounted thereon. On reciprocation of a body portion I of a power-operated plane, the cutting edges 10 of the cutters of the face-and-side cutters 9 interact in succession with the treatable material 15 to destroy it. Depending on the shape given to the cutting edges 10 of the cutters of the face-and-side cutters 9, the cutting head 5 carries out planing or shaping operations of the surface of said treatable material 15. And shoes 11 and 12 of a rear support assembly are disposed in grooves formed by the respective face-and-side cutters 9 of the cutting head 5 in the treatable material 15 and cooperate with the walls of said grooves. On account of said cooperation with the groove walls, the shoes 11 and 12 impede a deviation of the body portion I from the predetermined direction of motion. Inasmuch as the rear support assembly comprises at least two shoes 11 and 12, a deviation of the power-operated plane when acted upon by vibration forces, from the predetermined direction of motion is precluded in principle. In case of necessity to change the surface contour of the treatable material 15, a change in the position of the cutting edges 10 of the cutters of the face-and-side cutters 9 is made as required by the afore-described method. And the shoes 11 and 12 of the rear support assembly are rearranged edgewise of the body portion I by screwing bolts 18 out of threaded holes 16 in the body portion I and by sequentially screwing same in the respective additional threaded holes 19. In-

asmuch as a pitch (A) of rearrangement of the shoes 11 and 12 edgewise of the body portion I is multiple of a width (C) of the face-and-side cutter 9, the shoes 11 and 12 mounted in a new position will always find themselves in a groove defined by the respective face-and-side cutter 9. While planing the treatable material 15, i.e. in case where the cutting edges 10 of the cutters of all the face-and-side cutters 9 are arranged in parallel relation to a longitudinally extending axis 7 of the cutting head 5 and are spaced at an equal distance from said axis, the shoes 11 and 12 of the rear support assembly are mounted at a maximum distance from each other. And a distance (F) about the longitudinal symmetry axis 7 of the cutting head 5 between the outside lateral surfaces of the extreme shoes 11 and 12, when mounted at a maximum distance from each other, shouldn't exceed a length (G) of the cutting head about the same axis 7. Said ratio permits the shoes 11 and 12 to interact with the walls of a groove formed in the treatable material 15 by the face-and-side cutters 9 of the cutting head 5, thus maintaining the specified direction of motion of the power-operated plane.

[0029] If the formation of a shaped surface is required on the treatable material 15, which has an untreated portion, while mounting the cutting head 5, an insertion piece 33 is set on the corresponding portion of the drive shaft 6 in place of the face-and-side cutter 9. On cooperation of the cutting head 5 with the treatable material 15, the untreated portion remains at a location of the insertion piece 33.

[0030] During operation, interaction with the treatable material 15 causes wear (blunting) of the cutting edges 10 of the cutters of the face-and-side cutter 9 of the cutting head 5. On attainment of permissible wear, the regrinding of cutters of the face-and-side cutters 9 of the cutting head 5 is carried out by the aforesaid method on the cutting head 5 being dismounted in advance on, for example a tool-grinding machine. A cutting head 6 is then mounted in the interior space of the body portion I of the power-operated plane. Regrinding of the face-and-side cutters 9 causes reduction of a diameter (D) of the cutting head 5 and, consequently, of a depth of planing or shaping operations, i.e. a change in the initial characteristics of the power-operated plane. For the specified depth of planing or shaping operations to be assured, with said diameter (D) of the cutting head 5 reduced upon the regrinding of cutters of the face-and-side cutters 9 thereof, said cutting head 5 is moved with respect to the body portion I downwards at a distance corresponding to half-the-difference between said diameters (D) of the cutting head 5 before and after the regrinding, for which purpose anchoring elements 30 which call for locating body portions 23 of bearing assemblies 22 are released with respect to the body portion I of the power-operated plane, and bolts 27 are turned in a direction as required. On rotation, the bolts 27 are screwed out of threaded holes 28 in the respective body portions 23 of the bearing assemblies 22. Inasmuch as a carrier ring 29 impedes the axial displacement of bolts 27 relative to the body portion

I of the power-operated plane, then while screwing them out of said threaded holes 28, the body portions 23 of said bearing assemblies 22 will be displaced in a vertical plane along grooves 24 in the body portion 1 of the power-operated plane. Be it noted that anchoring elements 30 will not inhibit said displacement of the body portions 23 of the bearing assemblies 22, since these are arranged in grooves 31 on the body portions 23 of said bearing assemblies 22. Upon displacement of the body portions 23 of the bearing assemblies 22 downwards thru a given value, they will be located with respect to the body portion I of the power-operated plane in a new position. For said procedure to be performed, the anchoring elements 30 are tightened, said elements connecting the body portions 23 of the bearing assemblies 22 with the body portion I of the power-operated plane and impeding their reciprocal movement during operation. To improve accuracy of the movement of the cutting head 5 in relation to the body portion I of the power-operated plane, the body portion 23 of said bearing assembly 22 there can be provided a scale (not shown) with a graduation for the correspondence of an angle of rotation of said bolt 27 to the linear displacement of the body portion 23 of the bearing assembly 22. A change in the belt tension of belt drive because of the changed spatial position of the outgoing shaft of the motor 8 and the drive shaft 6 of the cutting head 5 after mounting the latter in a new position is compensated for, say, using a tension roller, which said compensation can likewise be carried out by moving the motor 8 along the corresponding grooves (not shown) in the body portion I of the power-operated plane and by mounting said motor 8 in said new position.

[0031] With the insertion pieces 33 provided on the drive shaft 6 of the cutting head 5, the operation of a power-operated plane will be performed in the afore-described manner, only with the shaping operations of the grooves carried out in the treatable material 15.

Claims

1. A power-operated plane comprising a body portion, a cutting head rotatably mounted in the interior space of said body portion with at least two drive-shaft-supported face-and-side cutters, and a rear support assembly in the form of at least two shoes arranged in parallel relation to the longitudinally extending symmetry axis of said body portion, said shoes being connected with said body portion via a releasable connection and being mounted with a faculty of pitch rearrangement edgewise of the body portion, **characterized in that** the cutting head is mounted with freedom to move relative to the body portion in a vertical plane and to be located in intermediate position, and the body portion is provided with a pair of symmetrically arranged and open-bottom grooves to receive the corresponding bearing assemblies of the cutting head and along with this the length of

each groove about its longitudinal symmetry axis is not less than 0.3 and not more than 0.9 diameter of the face-and-side cutter.

2. The power-operated plane according to claim 1, **characterized in that** it has means for moving the bearing assemblies of the cutting head.
3. The power-operated plane according to claim 2, **characterized in that** the cutting head bearing assembly movement means is constructed as a screw-type mechanism.
4. The power-operated plane according to claim 1, **characterized in that** it has locks for clamping the bearing assemblies of the cutting head with respect to the body portion.
5. The power-operated plane according to claim 1, **characterized in that** it has a front support assembly.
6. The power-operated plane according to claim 1, **characterized in that** the longitudinal symmetry axes of the grooves are arranged in a vertical plane.
7. The power-operated plane according to claim 1, **characterized in that** the longitudinal symmetry axes of the grooves are arranged at an acute angle to a horizontal plane passing thru the longitudinal symmetry axis of the body portion.
8. The power-operated plane according to claim 7, **characterized in that** an angle of inclination of the longitudinal symmetry axes of the grooves to the horizontal plane passing thru the longitudinal symmetry axis of the body portion is not less than 60°C.

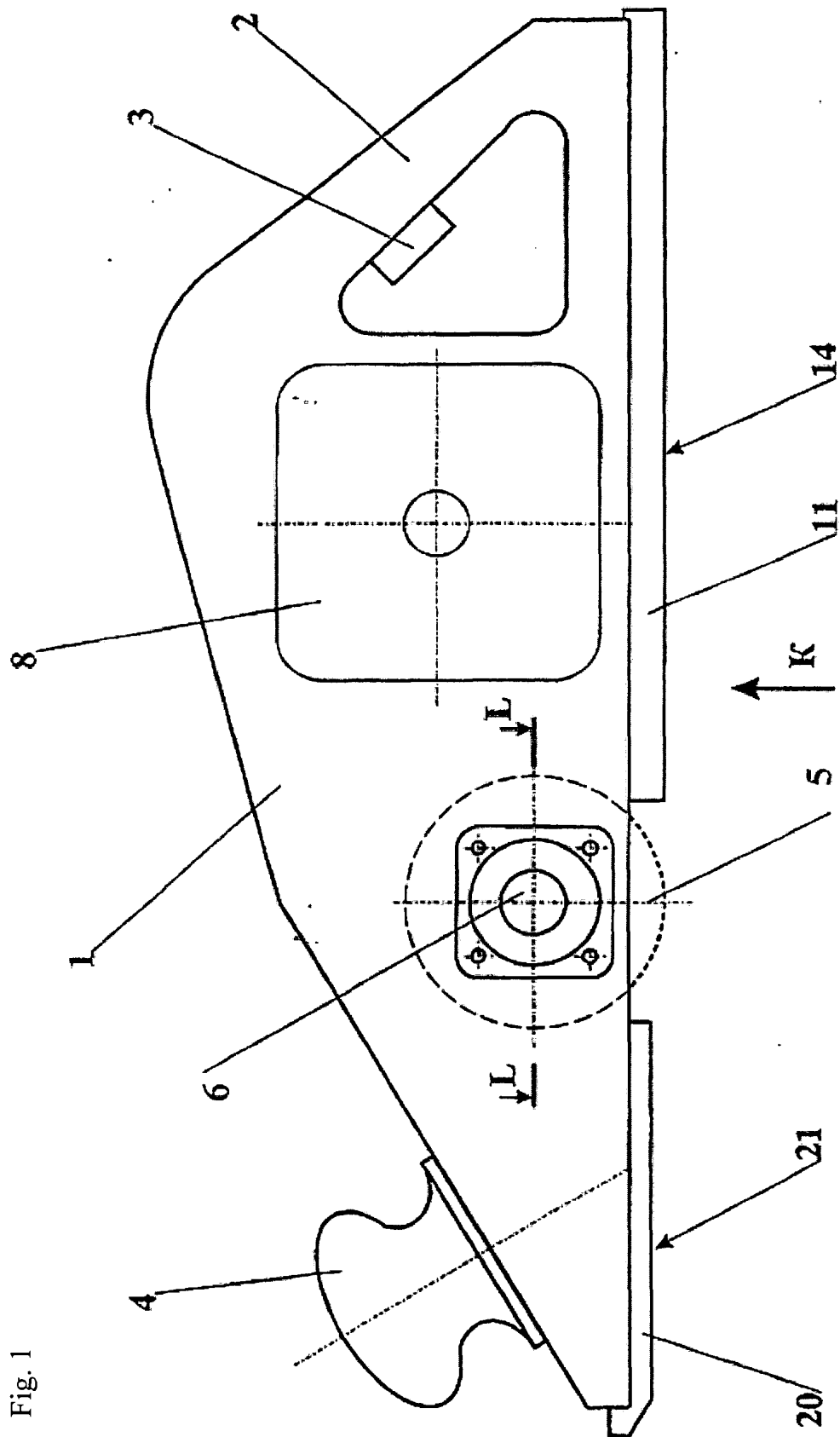


Fig. 1

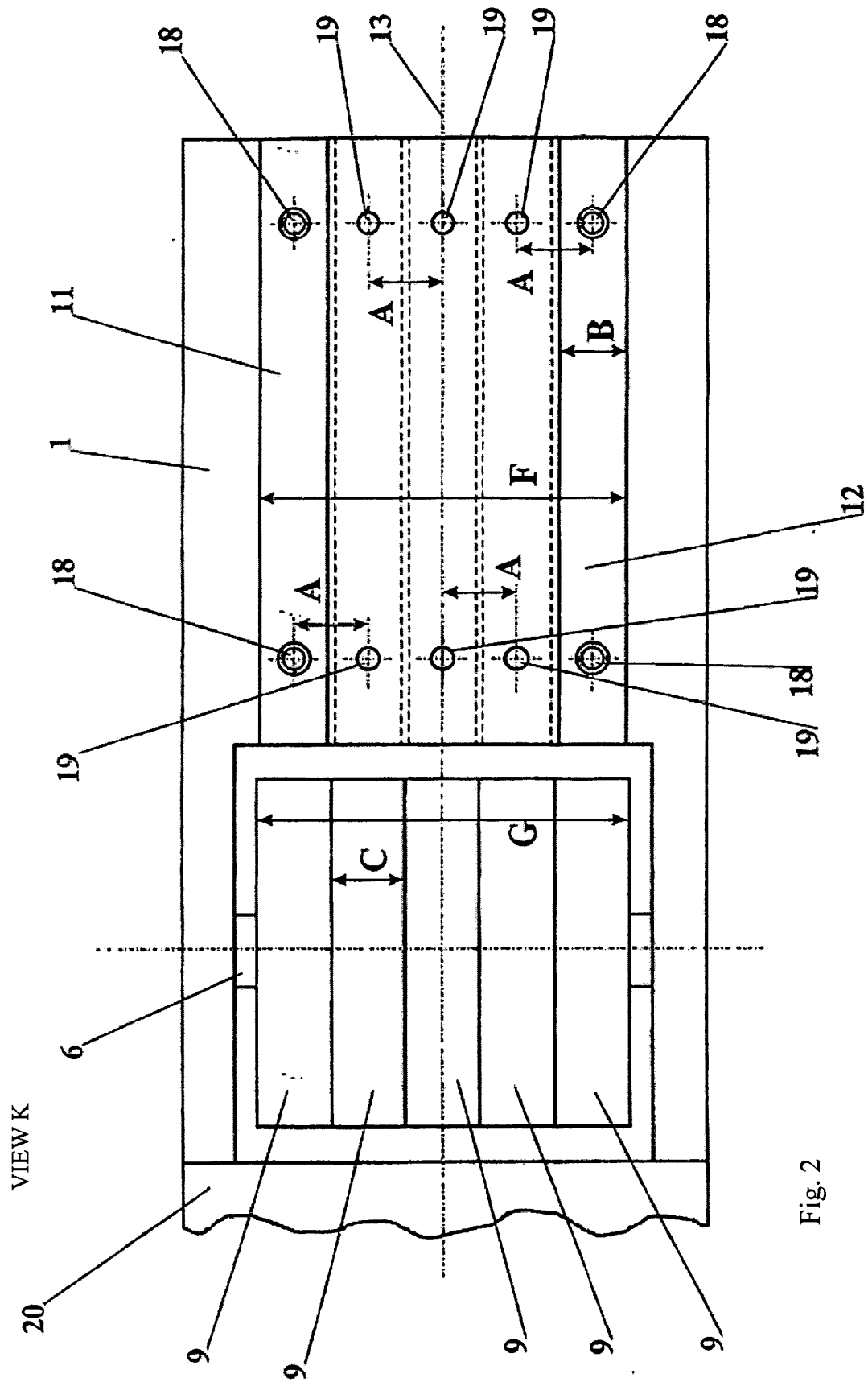


Fig. 2

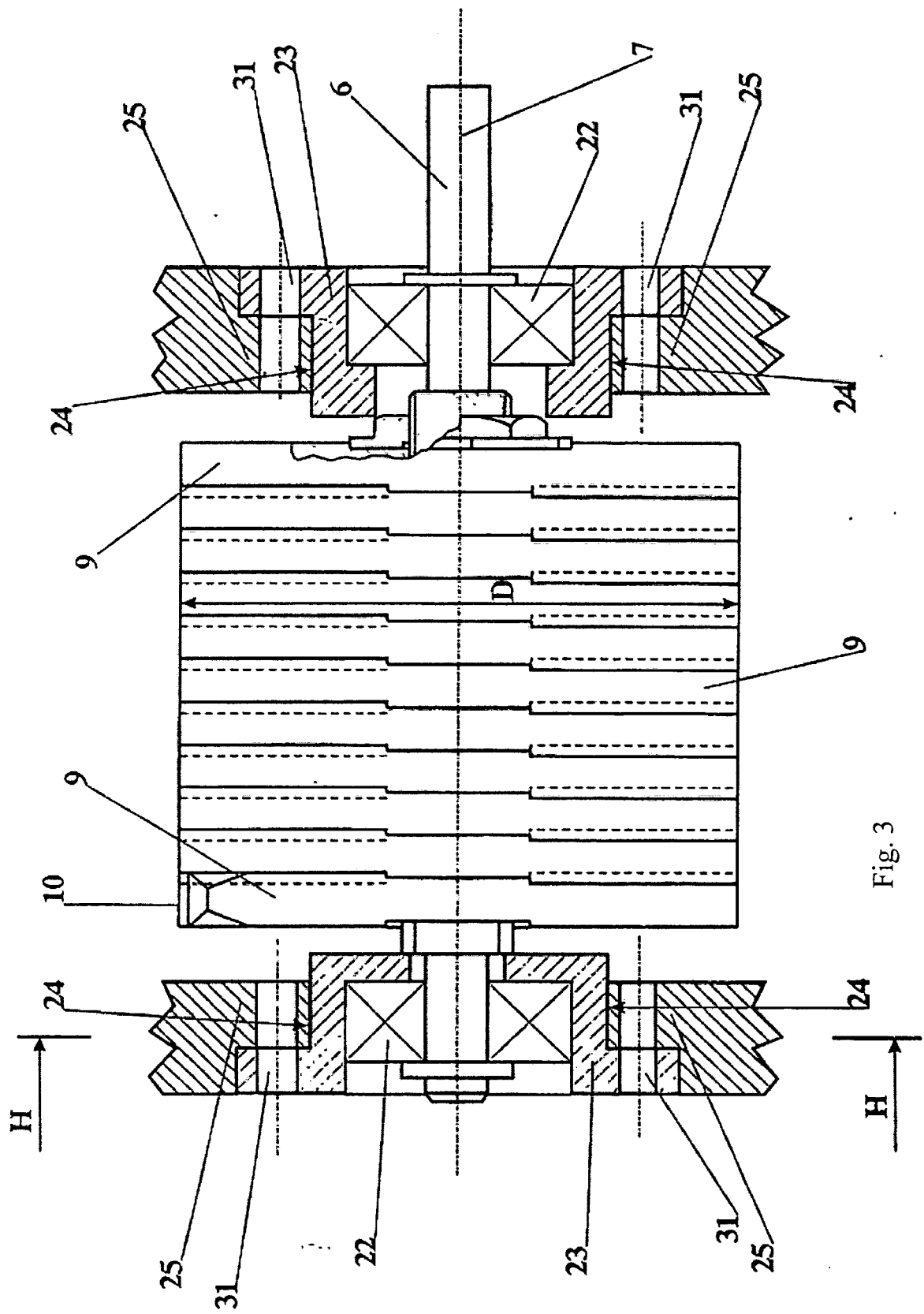


Fig. 3

H-H

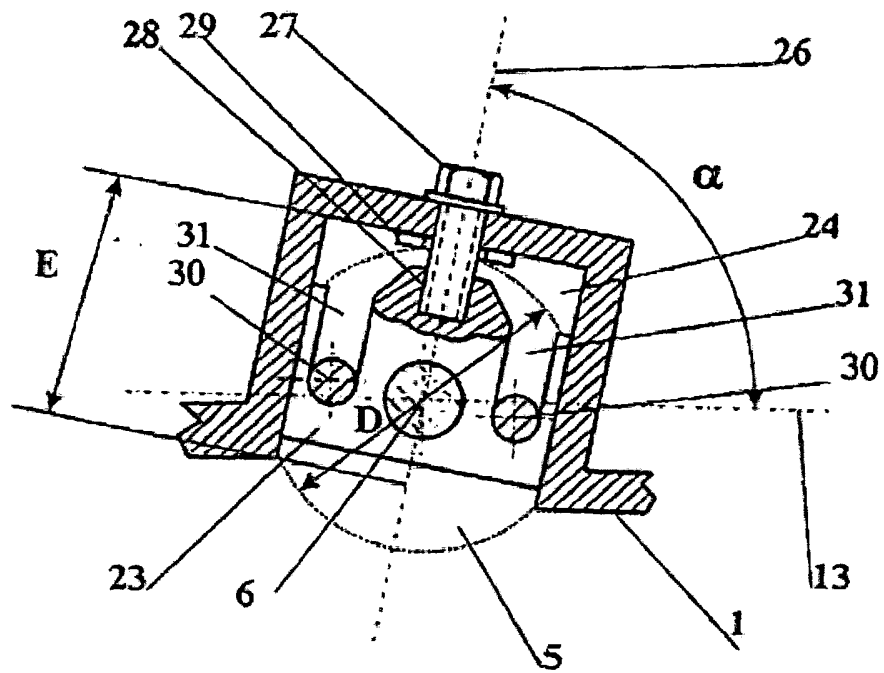


Fig. 4

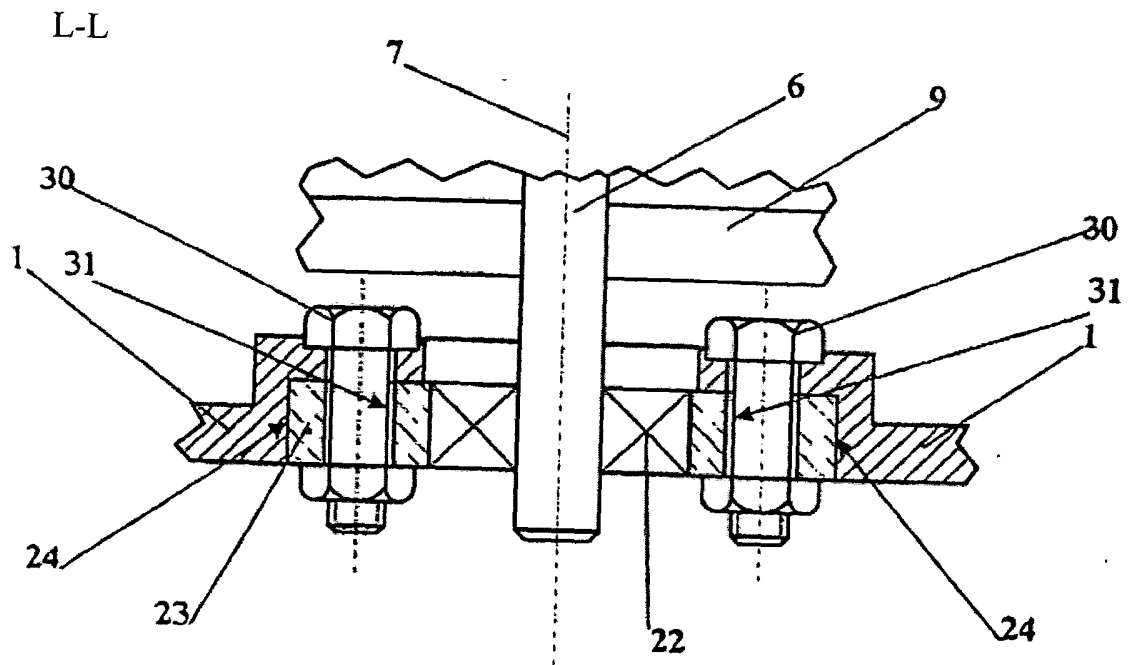


Fig. 5

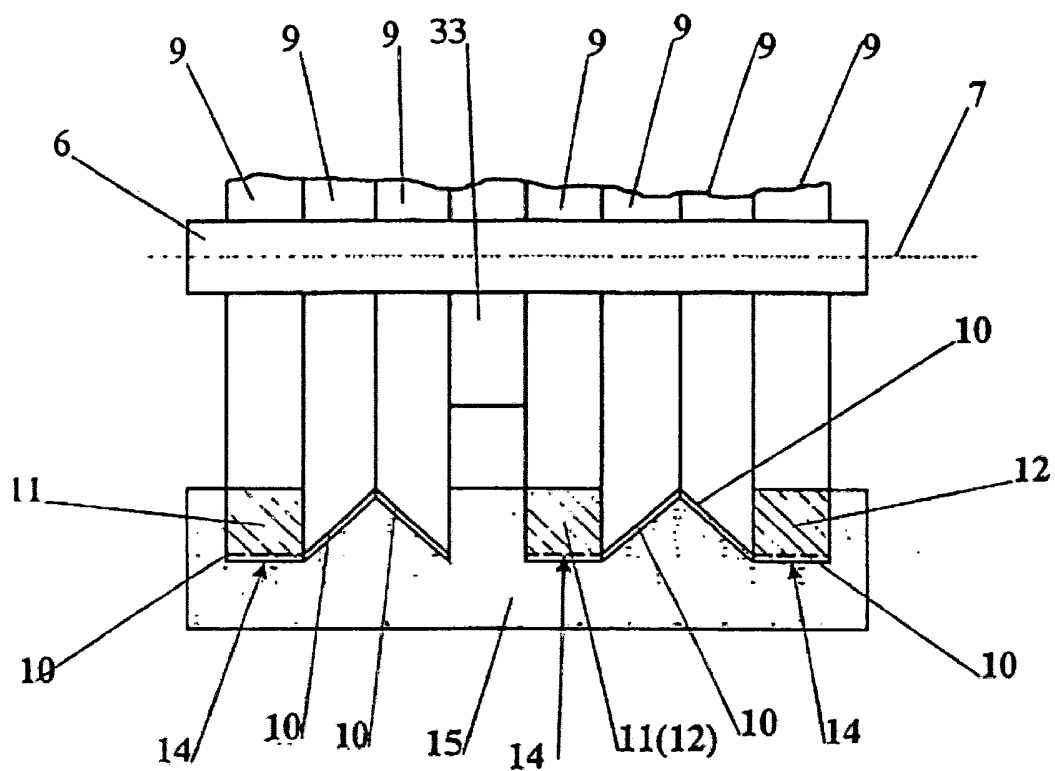


Fig. 6

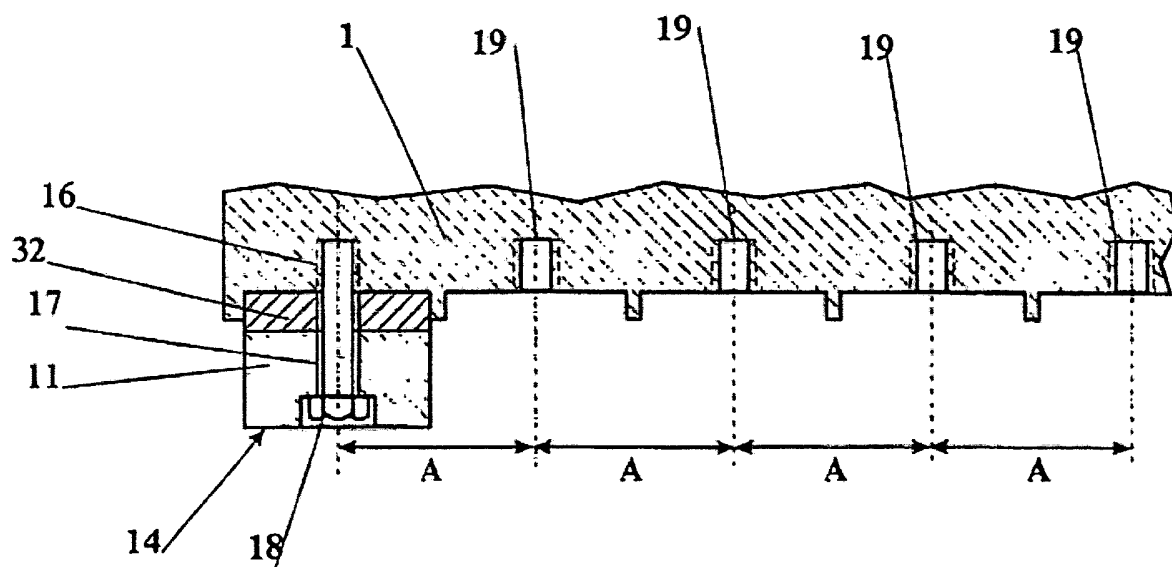


Fig. 7

INTERNATIONAL SEARCH REPORT

International application No.
PCT/RU2005/000555

A. CLASSIFICATION OF SUBJECT MATTER B27C 1/10 (2006.01)		
According to International Patent Classification (IPC) or to both national classification and IPC		
B. FIELDS SEARCHED		
Minimum documentation searched (classification system followed by classification symbols)		
B27C 1/00, B27C 1/10, B25F 5/00, B25F 5/02, B27G 13/00, B27G 13/12, B27G 17/00, B27G 17/02		
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched		
Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)		
Esp@cenet, USPTO DB, PAJ, RUPAT, RUAB, RUPAT OLD, EAPATIS		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	RU 2231441 C1 (PONOMAREV L. A. et al) 27.06.2004, the abstract, page 2, paragraph 7; page 3, paragraphs 5, 10, 11; page 4, paragraphs 7-10; claims 1, 7-10; figures 1, 3-5, [on-line] [found on 15.03.2006]. Found on database RUPAT	1 - 8
Y	RU 2236346 C1 (PONOMAREV L. A.) 20.09.2004, the abstract, page 2, paragraphs 6, 7; page 3, paragraphs 1-6; claims 1-3; figures 1, 6. [on-line] [found on 15.03.2006]. Found on database RUPAT	1 - 8
A	EP 0878280 A2 (TREVISO EZIO) 18.11.1998, the abstract, [on-line] [found on 06.03.2006]. Found on database esp@cenet	1-8
A	US 4584772 A1 (BLACK & DECKER OVERSEAS AG) 29.04.1986, the abstract, [on-line] [found on 06.03.2006]. Found on database esp@cenet	1-8
☐ Further documents are listed in the continuation of Box C. ☐ See patent family annex.		
* Special categories of cited documents: "A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier application or patent but published on or after the international filing date "L" document which may throw doubts 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 international filing date but later than the priority date claimed "T" later document published after the international filing date or priority date and 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		
Date of the actual completion of the international search		Date of mailing of the international search report
15 March 2006 (15.03.2006)		23 March 2006 (23.03.06)
Name and mailing address of the ISA/		Authorized officer
Facsimile No.		Telephone No.

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

- WO 2236346 A [0002]
- WO 2231441 A [0004]