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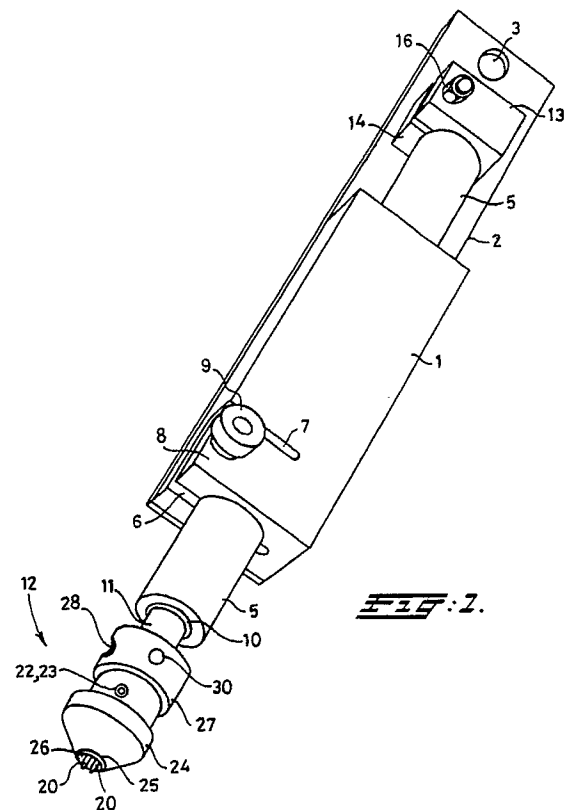
(71) Applicant: **ELCON MACHINEFABRIEK B.V.**
Westeinde 11
NL-2451 VZ Leimuiden(NL)

(72) Inventor: **Meijer, Pieter Gerard**
8, Westeinde
NL-2451 VZ Leimuiden(NL)

(74) Representative: **van der Arend, Adrianus G.A.,**
Ir. et al
EXTERPATENT B.V. P.O. Box 90649
NL-2509 LP The Hague(NL)

(54) **Precutting apparatus for a sawing apparatus.**

(57) Pre-cutting device for a sawing apparatus with a saw blade, comprising a base part (1) which is to be fixed to the sawing apparatus and which has a channel running above a saw cut to be made by the saw blade in a workpiece and running essentially perpendicular to the saw cut, a bar (11) which can be slid axially against spring (18) pressure in the channel, and two cutting elements which are fitted to the bar in a head of the bar outside the channel, and which are suitable for cutting into the workpiece two parallel grooves which correspond to the boundary lines of the saw cut subsequently to be made between the grooves, in which the head of the bar has two bores running parallel to the sliding direction of the bar, and each cutting element is a pin (20) which is fitted in a respective bore, and of which a free end projecting beyond the bore has a sharp point.



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PRECUTTING APPARATUS FOR A SAWING APPARATUS.

The invention relates to a pre-cutting device for a sawing apparatus with a saw blade, comprising a base part which is to be fixed to the sawing apparatus and which has a channel running above a saw cut to be made by the saw blade in a workpiece and running essentially perpendicular to the saw cut, a bar which can be slid axially against spring pressure in the channel, and two cutting elements which are fitted to the bar in a head of the bar outside the channel, and which are suitable for cutting into the workpiece two parallel grooves which correspond to the boundary lines of the saw cut subsequently to be made between the grooves. The pre-cutting device is used in particular in the sawing of workpieces with a decorative surface, for example of plastic, which without the provision of the grooves could be damaged by the sawing with the saw blade along the saw cut, in particular with serrations.

A pre-cutting device of this type is known from European Patent Application 0,189,095. In the case of the known pre-cutting device the head is detachably connected by means of a dovetail coupling to one end of the bar. The loose head is made up of two halves, each with a flat side, which when the halves are brought against each other form a parting plane of the halves which runs perpendicularly in the centre of the saw cut to be made. Each half has at an end of the head to be brought opposite the workpiece, at the parting plane side, a recess for the accommodation therein of a square plate with straight cutting edges, which forms the cutting element, and which is drawn into the recess and retained by means of a screw. The position of the plate is such that a groove to be made in the workpiece is cut by a corner of the plate. At an opposite-lying end of each head half is a dovetailed part which can be accommodated in a corresponding recess at the end of the bar and can be fixed by means of a screw. The dovetailed part contains a threaded bore running at right angles to the parting face. The bores of the two halves are of different diameters. Provided in the bores is a common screw with screw thread matching the screw thread of each bore. The position of a groove to be made by a cutting element relative to the saw cut to be made can be set by unlocking the appropriate head half from the bar for each cutting element separately, and then turning the common screw. For replacement of the cutting elements, the two halves must be taken apart. Each head half also has a follow element in the form of a wheel with a centre line running parallel to the bores. The depth of the grooves is determined by the distance between an end face of a

follow element to be fitted against the workpiece and a point of the cutting element by which the groove is being cut. The follow element is used for resting against the surface of the workpiece during the cutting with the cutting elements, in order to prevent material from lifting up and coming away from the workpiece.

The known pre-cutting device has the disadvantage that it is complex, and is thereby expensive and cumbersome to use. Complex and time-consuming operations are necessary for setting of the cutting elements relative to the saw cut to be made, and for replacement of the cutting elements. Another disadvantage is that, as a result of the fixed position of the cutting elements relative to the follow elements, the depth of the grooves cannot be adjusted. A difference in depth occurring as time passes as a result of wear of the cutting points of the cutting elements cannot be adjusted. Since each roller element is in the form of a wheel and thereby rolls over the workpiece, dirt present on the wheel will easily be able to remain on it and consequently cause an uneven depth of the grooves during rolling of the wheel. Another disadvantage is that the head is held essentially through friction of the bar in the channel, as a result of which the friction has to be relatively great in order to prevent loss of the head out of the channel, and this means that the return of the head after being pushed against spring pressure into the channel is relatively slow, while during the cutting of a workpiece with an uneven surface this surface cannot be followed satisfactorily, so that the depth of the groove is uneven, or in a deep part of the workpiece the groove is even missing.

The object of the invention is to eliminate these disadvantages of the known pre-cutting device.

For this, the pre-cutting device of the type mentioned in the introduction according to the invention is first characterized in that the head of the bar has two bores running parallel to the sliding direction of the bar, and in that each cutting element is a pin which is fitted in a respective bore and of which a free end projecting beyond the bore has a sharp point. This provides a very simple, cheap construction in which the pins can easily be replaced. The head can in this case form an integral part of the bar or can be a loose head, so that a user of the pre-cutting device can, if desired, select different heads with pins provided at different distances from one another.

The bores preferably end in a slit provided crosswise in the bar. A very accurate, even depth of the bore is obtained in this way.

The bar preferably has another bore running

halfway between the bores and crossing the plane of the bores, said other bore being provided with a screw thread for securing the pins by means of a screw to be screwed in the threaded bore. This allows the pins to be replaced and fixed in a simple manner.

A follow element to be guided over a surface of the workpiece to be cut into is preferably a sleeve which is slidable over the head of the bar, and of which the distance from the channel is limited by a retaining element engaging on the bar. Since the follow element slides only along the surface of the workpiece to be followed, no dirt will accumulate between the follow element and the surface to be followed, so that the occurrence of a groove with an irregular depth is prevented. The follow element is simple and cheap and can be retained simply on the bar, preventing loss by, for example, friction with the bar.

The retaining element is preferably an adjusting ring which is slidable around the bar and can be fixed on the bar by means of fixing devices. The depth of the grooves to be cut in the surface of the workpiece by means of the pins can be set in this way.

The bar is preferably rotatable through a selected angle about the longitudinal axis thereof, and the bar can be locked in the selected angular position. Through the selection of a different angle it is in this way easy to obtain a different distance between the grooves to be cut in the workpiece, so that an easy adjustment to the width of the saw cut can be obtained.

The device preferably has a scale and a marker point opposite the scale, the scale and the marker point being provided on the bar and on a part which cannot be turned about the longitudinal axis of the bar, in such a way that the marker point indicates on the scale a distance belonging to the selected angular position between the sharp points of the pins, measured at right angles to the grooves to be made therewith. The set distance can be read off simply in this way.

The invention is explained with reference to the drawings. In the drawings:

Fig. 1 shows in perspective an embodiment of the pre-cutting device according to the invention;

Fig. 2 shows a partial longitudinal section of the device of Fig. 1;

Fig. 3 shows a view of the device of Fig. 1 at the side with the cutting pins thereof;

Fig. 4 shows a longitudinal section of a head part of the device of Fig. 1.

The embodiment of the pre-cutting device according to the invention shown in Fig. 1 comprises a base part 1 to which a baseplate 2 is fixed, the baseplate having a passage 3 and a stud bolt 4

(Fig. 2) for fixing to a sawing apparatus (not shown) with a saw blade running at right angles to the baseplate 2 for making a saw cut in a workpiece which is not shown.

The base part has a channel which runs parallel to the baseplate 2 and at right angles to the saw cut to be made, and in which a tube 5 is slidable. The base part 1 also has a slit 6 running from a side of the base part 1 parallel to the baseplate 2 until past the channel, and a slit 7 running from the same side of the base part 1 until past the channel and at right angles to the slit 6 and the baseplate 2. The slits 6 and 7 form a flexible part 8 of the base part 1 with a passage running at right angles to the baseplate 2, through which passage runs a stud bolt which is fixed in the section of the base part 1 below the flexible part 8. An adjusting nut 9 is screwed on the stud bolt above the flexible part 8. By tightening the nut 9 the flexible part 8 of the base part 1 is moved in the direction of the baseplate 2, causing the tube 5 to be clamped in the channel of the base part 1.

The tube 5 has at its end plain bearings 10 which are fixed at the inside of the tube 5. A bar 11 is fitted so that it is slidable in the plain bearings 10. The bar 11 has at one end a head part 12 to be fitted opposite the workpiece and at the other end a slide block 13 with a slit 14 for securing to the bar 5 by means of a stud bolt 15 screwed in a bottom part of the block 13 thereof and a nut 16 screwed on the stud bolt. The slide block 13 has a flat bottom side 17 with which it can slide over the baseplate 2. The bar 11 has at the end with the slide block 13 a part with a smaller diameter around which a spring is 18 fitted, by means of which the bar 11 can be pressed against the action of the spring 18 in the direction of the arrow 19.

The head part 12 (Fig. 4) has two bores running parallel to the bar 11, having in each of them a pin 20 with a pointed end situated outside the bar 11 and a flat end lying inside the bar 11 and resting against a radial wall of a saw cut 21 made transversely in the bar 11. Since such a saw cut can be made with accurately determined radial walls in the bar 11, this means that the distance by which the pins project from the bar 11 can be accurately determined. Between the saw cut 21 and the end of the bar 11 to be placed opposite the workpiece a radial bore with screw thread 22 is provided in a central perpendicular plane of the pins 20. A socket screw 23 is screwed into the bore 22 for securing the pins 20 in the bores in question.

A follow element 24 is fitted over the end of the bar 11 with the pins 20. The follow element 24 is in particular made of nylon 6 and is slidable with friction over the bar 11. The follow element 24 has a follow side 25 with a central aperture 26 through

which the points of the pins 20 project. During use of the pre-cutting device the follow face 25 of the follow element 24 rests against the surface of the workpiece in which the saw cut must be made. The depth of the grooves to be made in the workpiece by the pins 20 is adjustable by moving the follow element 24. The follow element 24 is prevented from accidentally moving in the direction of the arrow 19 by an adjusting ring 27 fitted round the bar 11. The adjusting ring 27 has a radial bore with screw thread 28 for screwing a screw 29 into it for locking the adjusting ring 27 on the bar 11. When the saw cut has to be made in a surface of the workpiece with a plastic covering, a practical setting of the adjusting ring 27 is such that the depth of the grooves made by the pins 20 is 0.1 to 0.2 mm.

The distance between the grooves made in the workpiece by the pins 20, for adaptation to the width of the saw cut to be made, is adjustable by removing the locking of the bar 11 inside the guide block 13, then turning the bar 11, as a result of which the distance between the pins 20 at right angles to the saw cut changes, and then securing the bar 11 again in the guide block 13 by tightening the nut 16. The turning of the bar 11 can be facilitated by using a pin (not shown) which is inserted in a radial bore 30 of the adjusting ring 27. A graduated scale and a marker point (not shown) are preferably fitted on the bar 11 and on a part which cannot turn about the longitudinal axis of the bar 11. The marker point can be, for example, a radial groove which is provided on the top side of the bar 11 which is not visible in Fig. 1, and the graduated scale can be provided along the periphery of this side of the bar 11 on the guide block 13.

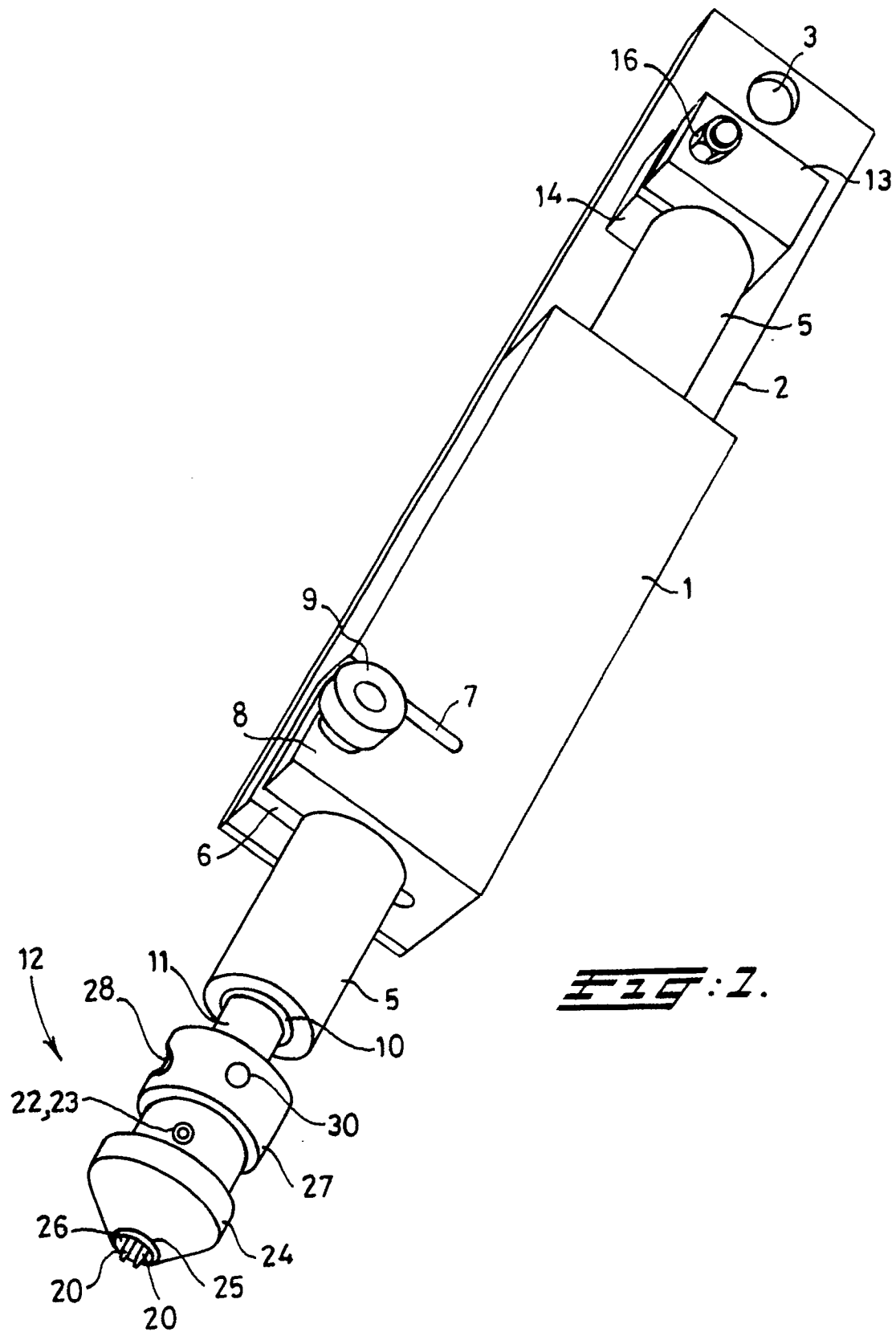
During use of the pre-cutting device the follow face 25 of the follow element 24 is guided over the surface of the workpiece to be sawn, the bar 11 being moved against the pressure of the spring 18 in the direction of the arrow 19, as a result of which the points of the pins 20 are pressed with a force determined by the springs 18 into the surface to be sawn. This force depends on the saw depth and can be adjusted by sliding the tube 5 inside the base part 1 and by then securing the tube 5 in the base part 1 by means of the adjusting nut 9. For a simple selection of a suitable setting, the tube 5 can be provided with a pointer (not shown) which on sliding of the tube 5 slides along a fixed graduated scale (not shown).

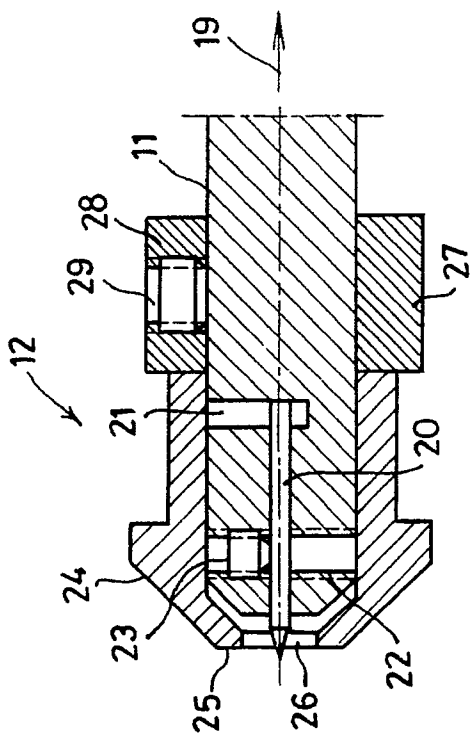
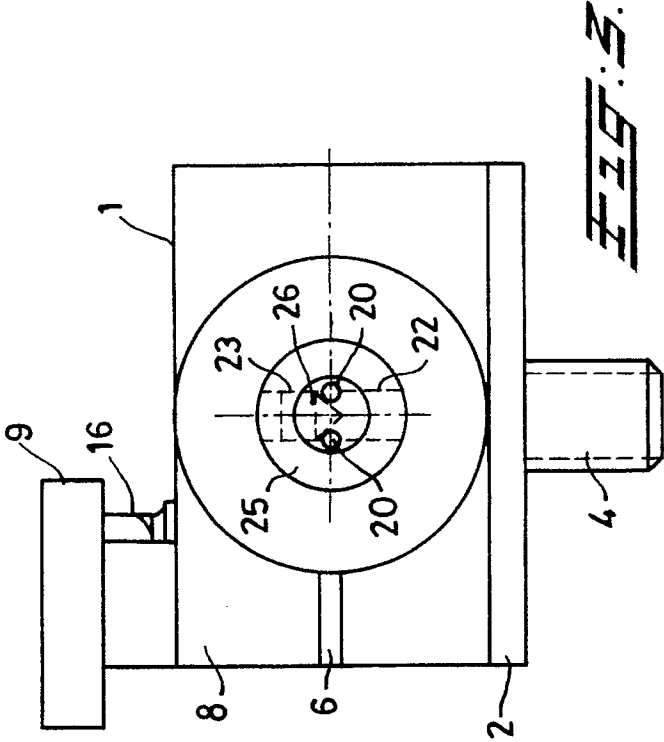
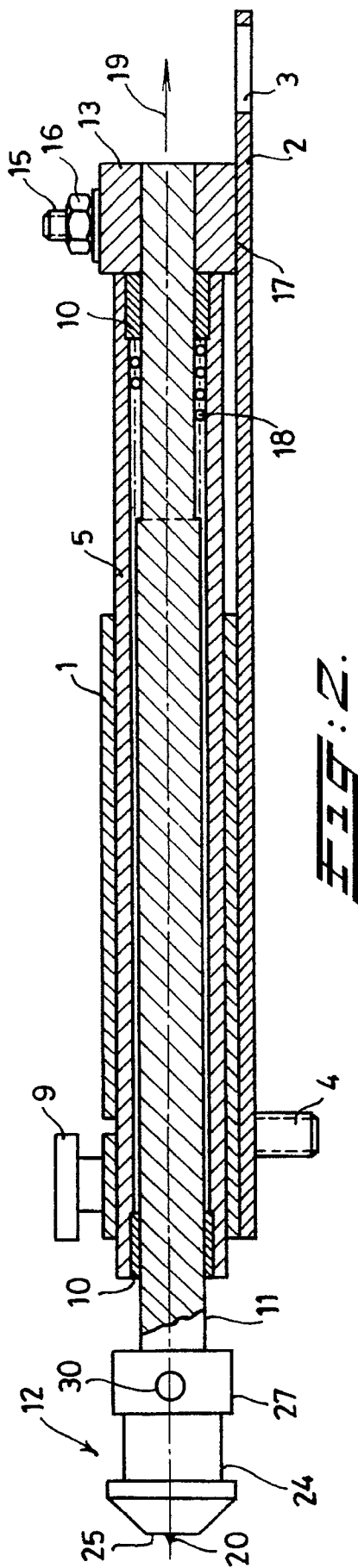
The pre-cutting device according to the invention explained with reference to the figures is simple and consequently cheap, and is easily adjustable.

Claims

1. Pre-cutting device for a sawing apparatus with a saw blade, comprising a base part which is to be fixed to the sawing apparatus and which has a channel running above a saw cut to be made by the saw blade in a workpiece and running essentially perpendicular to the saw cut, a bar which can be slid axially against spring pressure in the channel, and two cutting elements which are fitted to the bar in a head of the bar outside the channel, and which are suitable for cutting into the workpiece two parallel grooves which correspond to the boundary lines of the saw cut subsequently to be made between the grooves, **characterized in that** the head of the bar has two bores running parallel to the sliding direction of the bar, and in that each cutting element is a pin which is fitted in a respective bore and of which a free end projecting beyond the bore has a sharp point.
2. Pre-cutting device according to claim 1, **characterized in that** the bores end in a slit provided crosswise in the bar.
3. Pre-cutting device according to claim 1 or 2, **characterized in that** the bar has another bore running halfway between the bores and crossing the plane of the bores, said other bore being provided with a screw thread for securing the pins by means of a screw to be screwed in the threaded bore.
4. Pre-cutting device according to claim 1, 2 or 3, in which a follow element is fitted on the head of the bar, an end face of which element to be brought opposite the workpiece is situated at a smaller distance from the channel than a cutting point of the cutting elements, **characterized in that** the follow element is a sleeve which is slidable over the head of the bar, the distance of which sleeve from the channel is limited by a retaining element engaging on the bar.
5. Pre-cutting device according to claim 4, **characterized in that** the follow element is retained on the bar by friction.
6. Pre-cutting device according to claim 4 or 5, **characterized in that** the retaining element is an adjusting ring which is slidable around the bar and can be fixed on the bar by means of fixing devices.
7. Pre-cutting device according to any of the preceding claims, **characterized in that** the head of the bar is an integral part of the bar.

8. Pre-cutting device according to any of the preceding claims, **characterized in that** the bar is rotatable through a selected angle about the longitudinal axis thereof, and in that the bar can be locked in the selected angular position. 5
9. Pre-cutting device according to claim 8, **characterized by** a scale and a marker point opposite the scale, the scale and the marker point being provided on the bar and on a part 10
which cannot be turned about the longitudinal axis of the bar, in such a way that the marker point indicates on the scale a distance belonging to the selected angular position between the sharp points of the pins, measured at right 15
angles to the grooves to be made therewith.
10. Pre-cutting device according to claim 8 or 9, **characterized in that** the bar has a circular cross-section, in that the bar is inserted into a 20
passage of a guide piece, in that the guide piece is slidable parallel to the bar over a guide face of the base part, and in that the guide piece has means for locking the bar on the guide piece in the selected angular position. 25
11. Pre-cutting device according to any of the preceding claims, **characterized in that** the channel is formed by a tube which is axially 30
slidable in the base part, and in that the tube is lockable in a selected position relative to the base part.
12. Pre-cutting device according to claims 10 and 11, **characterized in that** the guide piece is 35
fitted at the other end of the bar away from the end with the head, and in that the guide piece opposite the tube forms a stop for limiting the axial displacement of the tube in the direction 40
of the head.
13. Pre-cutting device according to any of the preceding claims, **characterized in that** the pins are made of hard metal. 45
14. Pre-cutting device according to claim 13, **characterized in that** the pins are made of a tungsten carbide alloy. 50







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EUROPEAN SEARCH REPORT

Application Number

EP 90 20 3290

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
A,D	EP-A-0 189 095 (REICH) * abstract; figures *	1	B 27 G 19/10
A	DE-U-8 900 767 (STREICH) * the whole document *	1	
A	US-A-4 058 150 (PENNINGTON)		
			TECHNICAL FIELDS SEARCHED (Int. Cl.5)
			B 27 G B 26 D
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of search 24 April 91	Examiner RIS M.
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			