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(54) Pressing tool for pressing together floorboards, parquet and similar

(57) A pressing tool for pressing together floor boards, parquet, panel boards and similar, comprising a main body (1) having means (10) of temporarily attaching the tool to the support (20), and also a pressing block (7, 8) displaceably mounted relative to the main body (1), where the length of the tool may be adjusted in the longitudinal direction between a contracted and an extended position by rotating an intermediate piece (3), the intermediate piece (3) being rotatably connected about a first axle (4) to the main body (1) and rotatably connected about a second axle (14) to the pressing block, where the horizontal distance between the axles (4, 14) may be adjusted by rotating the intermediate piece (3) relative to the main body (1), where the first axle (4) or the second axle (14) is connected to the main body (1) or the pressing body (7, 8), respectively, via a resilient body (17).

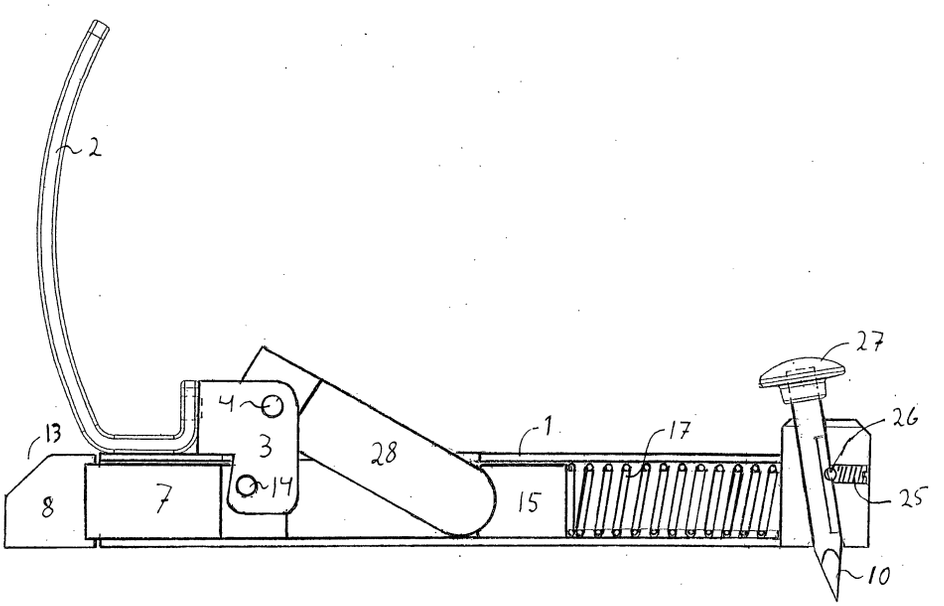

Fig. 5

EP 1 270 844 A1

Description

[0001] The present invention regards a pressing tool for pressing together floorboards, parquet, panel boards and similar, in order to lighten the work and reduce the labour requirements associated with such work.

[0002] Laying floorboards normally involves laying a first board that has to be aligned accurately so as to leave it straight and true relative to e.g. the wall from which the floor is to be laid. In the case of a floor that is to be nailed or screwed to the support, this board is fastened first, usually with the tongue in the direction of the next board. The next board is laid with the groove facing the first board, and the boards are pressed or knocked against each other to make them fit closely before this next board is fastened to the support. One then continues in the same manner until the floor has been laid.

[0003] In the case of a so-called "floating floor", which is not attached to the support, the first board is held in place relative to the starting position by means of wedges or similar. The boards of a floating floor are normally glued together. However the same problem applies as for other floors; the boards must be pressed together properly.

[0004] When laying a floor using long boards of e.g. 4-5 m, it takes two or more persons to press the entire length of board up against the previous board in a satisfactory manner and prevent the boards from slipping out of the mutual engagement at one end while they are being pressed together at the other end.

[0005] The most commonly used tool today for pressing together boards when laying floors, is a striking block that is placed in abutment against the board that is to be laid against the previous board, and which, when hit by a hammer, spreads the striking surface so as not to damage the board. This is a primitive tool that in the long run makes for relatively heavy work. Moreover, it does not prevent the boards from slipping out of engagement with the previous board at one end when work is being done at the other end.

[0006] Other tools to simplify the work are also known from prior art, first and foremost for professional floor layers.

[0007] From SE 340 158 there is known a device that makes use of a lifting jack for pressing together a plurality of partially engaged boards positioned adjacent to each other. It is stated that this will allow single handed laying of floors. However, it is a heavy device that seems as if it may require support from a wall or similar.

[0008] From US 2 933 288 there is known a tool comprising a base component that is placed in abutment against the support, and also a moving part located in the base component, and which may be displaced by means of a lever arm and a toothed rack mechanism. The base component may be fastened to the support by means of sharp feet, while the moving part may be displaced so as to press against the board that needs to be forced into place. The moving part may be locked to enable the device to keep the board in place over a longer period. However, the device has a relatively complex construction, is relatively costly, and ends up being so heavy as to render it of little practical daily use for a floor layer.

[0009] US 2 710 166 and US 3 143 335 describe alternative tools that bear a great likeness to US 2 933 288, but are based on a hydraulic mechanism instead of a toothed rack mechanism. US 2 710 166 has sharp feet for attaching to the support, while US 3 143 335 has eccentric wheels for attaching to floor beams.

[0010] From US 1 049 725, US 1 239 306 and FI 24569 there are known pressing tools for floor laying, all of which comprise means of fastening a first part to the support on which the floor is to be laid, and a pressing block for pressing the floor boards together. The horizontal distance between the first part and the pressing block may be altered by means of an operating handle that rotates an intermediate piece rotatably attached to the operating handle and the pressing block. In US 1 049 725, the tension of the pressing tool may be adjusted by the operating lever being locked in a desired position by means of a locking device. The two remaining tools possess no means of tension adjustment.

[0011] However none of these tools have gained any widespread use, which for several of the tools may be traced back to high costs, complex construction and relatively high weight, or the lack of options for adjusting the pressing tension of the device, which makes them rather user unfriendly. Furthermore, several of the tools are so unstable against the support as to make them unsuitable for modern parquet or laminate, although they may have a purpose when used on thick load-carrying floor boards. When laying thin materials, and especially when fitting this in a floating fashion, an unstable tool could lift the floor that is already laid, up from the support, thus preventing satisfactory and efficient floor laying.

[0012] Thus the object of the present invention is to provide a tool for easing the work of the floor layer, saving on labour and overcoming the above drawbacks.

[0013] According to the present invention, this is achieved by a pressing tool for pressing together floor boards, parquet, panel boards or similar when laying floors, comprising a main body with means of temporarily attaching the tool to the support, and also a pressing block that is mounted so as to movable relative to the main body, where the length of the tool may be adjusted in the longitudinal direction between a contracted and an extended position by rotating an intermediate piece, the intermediate piece being rotatably connected to the main body about a first axle and rotatably connected to the pressing block about a second axle, where the horizontal distance between the axles may be adjusted by rotating the intermediate piece relative to the main body, where the intermediate piece is connected through the first axle to the main body via a resilient body inside the main body.

[0014] According to a preferred embodiment, the resilient body is a spring.

[0015] Preferably, the intermediate piece may be rotated by means of an operating handle.

[0016] According to a preferred embodiment, the means of temporarily attaching the tool to the support consists of one or more needles on the main body.

[0017] Preferably, the needle or needles run in a groove on the main body, and the tip of the needle or needles may be retracted into the tool.

[0018] Preferably, the intermediate piece is also lockable when the tool is in the extended position, by the axles being offset relative to each other in a manner such that the spring forces the intermediate piece towards a stable locked position.

[0019] According to one embodiment, the pressing block comprises a base component made of metal, along with a push block mounted on this in a manner so as to be replaceable, which block is made from a softer material.

[0020] The present device will now be described in greater detail with reference to the appended figures, all showing a preferred embodiment of the present invention, in which:

Fig. 1 is a side view of a first preferred embodiment of the present tool in the contracted position;

Fig. 2 is a longitudinal section through the embodiment shown in figure 1, in the extended position;

Fig. 3 is a perspective view of a second preferred embodiment of the present pressing tool in the contracted position;

Fig. 4 is a perspective view of the same embodiment as that in figure 2, in the extended position;

Fig. 5 is a longitudinal section through the same embodiment as that shown in figure 1, in the contracted position; and

Fig. 6 is a longitudinal section through the same embodiment as that shown in figure 1, in the extended position.

[0021] A first preferred embodiment of the present invention is shown in figures 1 and 2. This embodiment comprises a main body 1 and a pressing block 7, 8 connected via an intermediate piece 3 via two axles 4, 14 running substantially parallel with the support and perpendicular to the longitudinal axis of the device. The intermediate piece 3 is rotatably connected to the main body 1 by means of axle 4 and rotatably connected to the pressing block 7, 8 by means of axle 14. Thus the pressing block 7, 8 and the main body 1 are connected with two hinge joints.

[0022] The axles 4, 14 run through the intermediate piece 3 and through holes 5 and 6 in the main body 1 and the pressing block 7, 8 respectively. Preferably, the holes 5, 6 are oblong in the longitudinal direction of the device in order to allow a smaller movement.

[0023] As shown in the figures, a lever 2 is fixed to the intermediate piece 3, with which the intermediate piece may be swivelled relative to the main body 1. The longitudinal direction of the lever 2 is substantially parallel to the plane defined by the axles 4, 14. Inside the main body 1 is provided a spring 17, e.g. a helical spring, where the end that points towards the intermediate piece abuts a spring retainer 15 with a head 16. The top of the head 16 is flat. The flat top is forced against the intermediate piece 3 by the spring.

[0024] The other end of the spring 17 abuts a block 18 that may move back and forth inside the main body in the longitudinal direction of the main body 1. A peg 11 travelling in a groove 12 will, in the embodiment shown, prevent the spring 17 from pressing the block out of the main body 1. The peg 11 and the groove 12 may optionally be replaced by another stop device to prevent the block 18 from being pushed out of the main body 1.

[0025] A needle 10 runs through the block 18; in the embodiment shown, the needle 10 is screwed down into the block 18 such that the part of the needle 10 sticking out of the block 18 may be adjusted. The needle 10 extends through the wall of the main body 1 through a groove or recess on the underside of the main body. On the top of the main body 1 is a groove 19 that allows access to the top of the needle10 for adjustment of the length of the needle. The purpose of the needle is to fasten the device to the support and prevent the device from moving about on this during the pressing action. The tip of the needle 10 is preferably pyramidal, as this gives better fastening to most supports.

[0026] Preferably, the needle forms an angle with the support, which deviates by 5 to 30° from the perpendicular on the support, preferably about 15°, where the tip of the needle points away from the pressing block 7, 8. Then, upon extension of the device, the needle 10 will be pressed further into the support, thus reinforcing the attachment to the support.

[0027] The present pressing tool may have more than one needle, but experiments carried out by the Applicant show that the use of more than one needle in practice does not give any noticeable improvement of the fastening effect.

[0028] Preferably, the pressing block 7, 8 is divided into the base component 7, which is preferably made from metal rotatably connected to the intermediate piece 3, and a push block 8 made from a "softer" material such as wood, Nylon or other synthetic materials. Preferably, the push block 8 is formed with a groove equivalent to the groove in a board, to allow this to engage the tongue on the board when this is pushed in. Furthermore, the push block is preferably formed with a

recess that allows the board to be nailed or screwed as indicated by a nail 21 in figure 2.

[0029] In use, the present pressing tool is laid down on the support 20, the push block 8 is placed in engagement with the board to be pushed in, and the operating handle 2 is placed in the "open" position, i.e. so that the axle 4 is essentially positioned immediately above the axle 14 up from the main body 1. The main body 1 is then pressed against the underlying flooring 20, so that the needle 10 is pressed down into this. Then the operating handle 2 is rotated down towards the main body 1. At this rotating motion, the intermediate piece 3 is rotated so as to increase the horizontal distance between the axles 4, 14, and thereby the length of the device. Movement of the main body in the direction away from the push block 7, 8 is prevented through the engagement between the needle 10 and the support. In order to ensure that the pressure on the board being pushed in, and also the pressure on the needle, does not become so great as to deform the needle or the support and make the needle 10 loose its hold, the spring 17 possesses a predetermined stiffness which is such that it is compressed when the force exceeds a predetermined limit. The stiffness of the spring 17 may be determined on the basis of the material of the boards being laid, along with the nature of the support. The force required to push the spring 17 in may optionally be adjusted by a setting screw or similar, with which the length and thereby the pretensioning of the spring 17 may be adjusted. In addition, the force with which the board is pressed in may be reduced relative to the full force by leaving the lever 2 in a position between the open and closed positions when commencing the pressing.

[0030] In the tensioned position, the flat top of the head 16 abuts and is forced, by the spring, against a flat lateral edge of the intermediate piece 3, while the opposite lateral edge of the intermediate piece 3 through its face abuts a flat portion of the pressing block 7, 8. The abutment of these faces provides locking of the hinge joints, and prevents relative rotation between the pressing block 7, 8, the intermediate piece 3 and the main body 1. This ensures that the device is locked in the tensioned position, so as to enable it to be used for pressing over a longer period, e.g. from minutes to hours as required.

[0031] Figures 3 to 6 illustrate a second preferred embodiment of the present pressing tool. This tool essentially comprises the same elements as the first described embodiment. The main distinction between the first and the second embodiment lies in the main body 1. In this embodiment, the main body 1 lies in the same plane as the support during the entire process, and the push block 7, 8 is also located in approximately the same plane throughout. The base component 7 of the push block 7, 8 here extends into the main body 1 and the intermediate piece 3, which is manipulated by means of the handle 2, is swivelled up through an opening 29 in the base component in order to contract the tool and back down into the tool in order to extend the tool. In order to allow this, a sliding part 28 has been inserted, which is rotatably attached to the intermediate piece about the axle 4, and which is arranged so as to push against the spring retainer 15 and thereby the spring 17. Swivelling the intermediate piece 3 and the sliding part 28 out of the plane makes it possible for the rest of the tool to lie flat against the support, thereby reducing the risk of the floor already laid being pressed up from the underlying flooring.

[0032] In order to lock the pressing tool in the position in which the tool is pressing against a board, i.e. when the tool is in the extended position, the axles 4, 14 are, in this position, offset relative to each other, so that the pressure from the spring 17 results in the axle 4 being pressed down (seen in the figure) towards the inside of the main body 1. In order to unlock the pressing tool, it is therefore necessary to lift the lever 2 with a force equivalent to this opposite force resulting from the displacement of the axles.

[0033] The function of the spring 17 is to stabilise the tool both in the contracted and the extended positions. In the contracted position, i.e. in the position in which the tool has the shortest overall length, the spring 17 exerts a constant pressure on the intermediate piece 3 to keep this and the handle 2 stable and at rest. When the tool is in the extended position, the spring 17 also exerts a constant pressure against the intermediate piece, which as a result of said displacement of the axles 4, 14 is kept in this extended position, so as to keep the tool stable and locked. In addition, the tool exerts a pressure against the materials that are to be pressed together, even if the materials move slightly.

[0034] The needle 10 of the second preferred embodiment may be displaced along its longitudinal direction through being located in a duct. A spring 25 presses a ball 26 against the needle to prevent the needle 10 from sliding without friction in this duct. When the device is to be fastened to the support, the needle 10 may be driven into the support by hitting the head 27 of the needle with a hammer or similar. When the tool is not in use, the tip of the needle may be retracted into the tool so as to avoid injuries.

[0035] The spring 17 may be adapted to the specific requirements. Thus the tension in the spring may vary from one tool to the next. The tool may also comprise a setting screw (not shown) for adjusting the length and thereby the pretensioning of the spring. In some applications, it is conceivable for the spring to be adapted so as to allow it to be fully compressed, or a core may be arranged in parts of the spring, which upon a given compression of the spring provides a direct push without springiness.

[0036] In the embodiments shown, the spring 17 is located between the mounting of the needle 10 and the intermediate piece 3. However it may also be appropriate to position the spring between the push block 8 and the intermediate piece 3.

[0037] The present pressing tool may also be used for other purposes than laying floors, and may be used in various ways for purposes that require the pressing together of parts. Thus it may be used as a vice for pressing together materials to be glued etc.

[0038] In one of the embodiments shown, figures 1, 2, the push block 8 is constructed to engage a tongue on a board. For many purposes, it may be appropriate for the push block 8 to have a flat, possibly corrugated pushing face as shown in figures 3 to 6. For certain choices of materials of the push block 8, this may be necessary to prevent the block from sliding on the material against which it is being pressed. The advantage of a flat/corrugated pushing front rather than a block with a tongue/groove adaptation is that the same push block may be used for different floor panels regardless of the construction of the tongue. Preferably, the push block 8 is fixed to the base component 7 by means of screws or similar to allow it to be replaced as required with another push block adapted for the purpose. For some applications, a push block without a groove may be envisaged, for pushing against a straight edge. Moreover, the construction of the push block may be matched to the thickness of the boards being used.

[0039] The present invention has been described with reference to laying floors. However, the tool is also useful for panelling walls or roofs. For these purposes the tool is used the same way as for laying floors and makes it possible to work shorthanded at high speed.

Claims

1. A pressing tool for pressing together floor boards, parquet, panel boards and similar, comprising a main body (1) having means (10) of temporarily attaching the tool to the support (20), and also a pressing block (7, 8) displaceably mounted relative to the main body (1), where the length of the tool may be adjusted in the longitudinal direction between a contracted and an extended position by rotating an intermediate piece (3), the intermediate piece (3) being rotatably connected about a first axle (4) to the main body (1) and rotatably connected about a second axle (14) to the pressing block (7, 8), where the horizontal distance between the axles (4, 14) may be adjusted by rotating the intermediate piece (3) relative to the main body (1),
characterised in that the intermediate piece (3) through the first axle (4) is connected to the main body (1) via a resilient body (17) within the main body (1).

2. A pressing tool according to Claim 1, **characterised in that** the resilient body (17) is a spring (17).

3. A pressing tool according to Claim 1 or 2, **characterised in that** the intermediate piece (3) may be rotated by means of an operating handle (2).

4. A pressing tool according to one or more of the preceding claims,
characterised in that the means for temporary attachment of the tool to the support (20) is one or more needles (10) on the main body (1).

5. A pressing tool according to one or more of the preceding claims,
characterised in that the needle or needles (10) run in a groove in the main body (1), and that the tip of the needle or needles (10) may be retracted into the tool.

6. A pressing tool according to one or more of the preceding claims,
characterised in that the intermediate piece (3) may be locked when the tool is in the extended position, by the axles (4, 14) being offset relative to each other in a manner such that the spring (17) forces the intermediate piece (3) towards a stable locked position.

7. A pressing tool according to one or more of the preceding claims,
characterised in that the pressing block comprises a metal base component (7), and also a push block (8) in a softer material, which is mounted on this component in a manner so as to be replaceable.

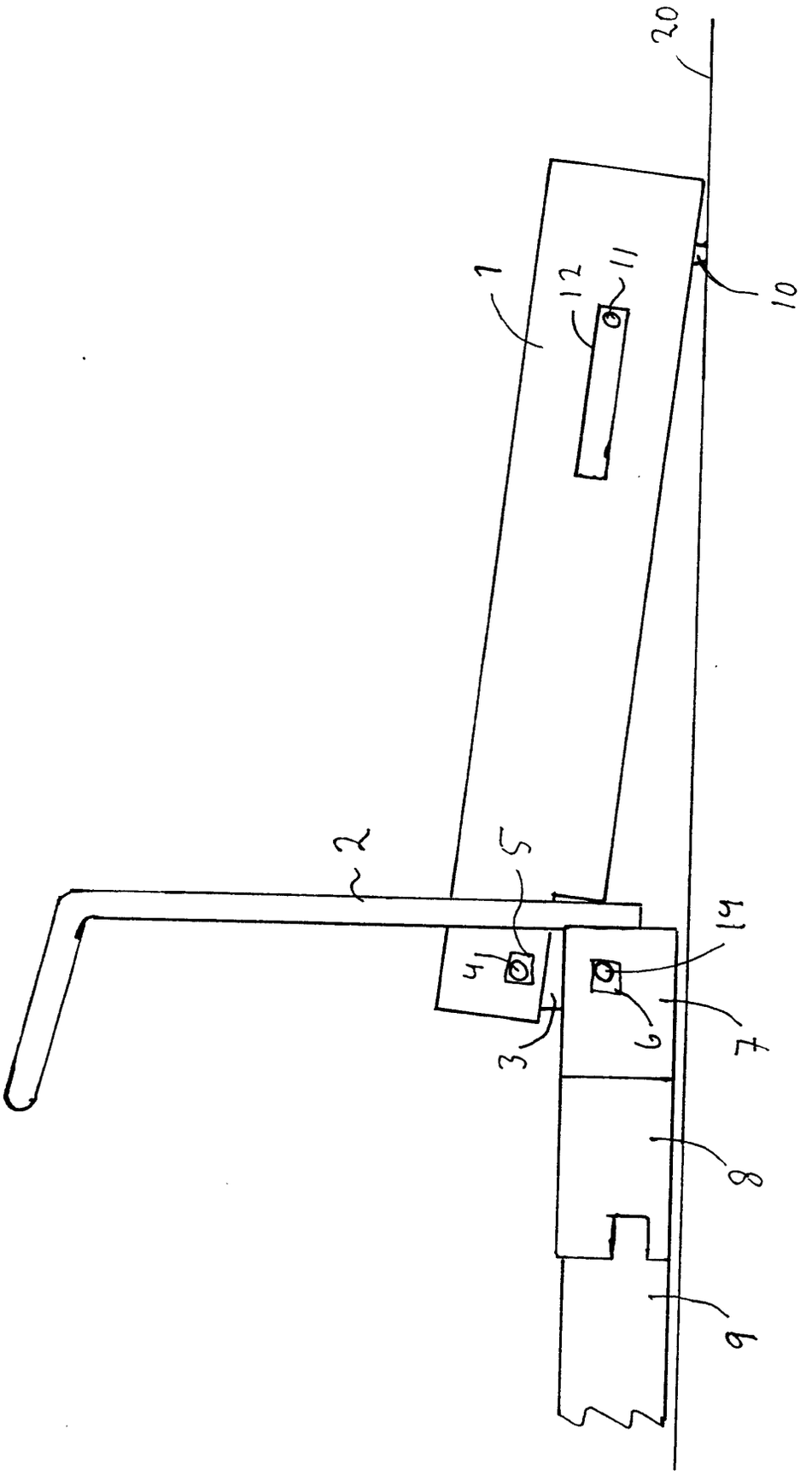

Fig. 1

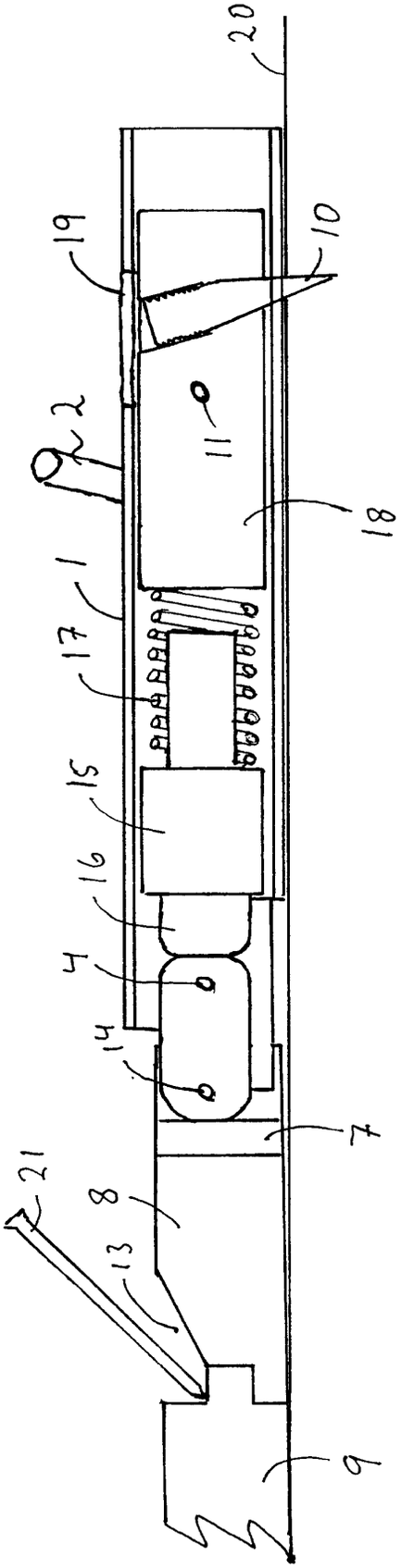

Fig. 2

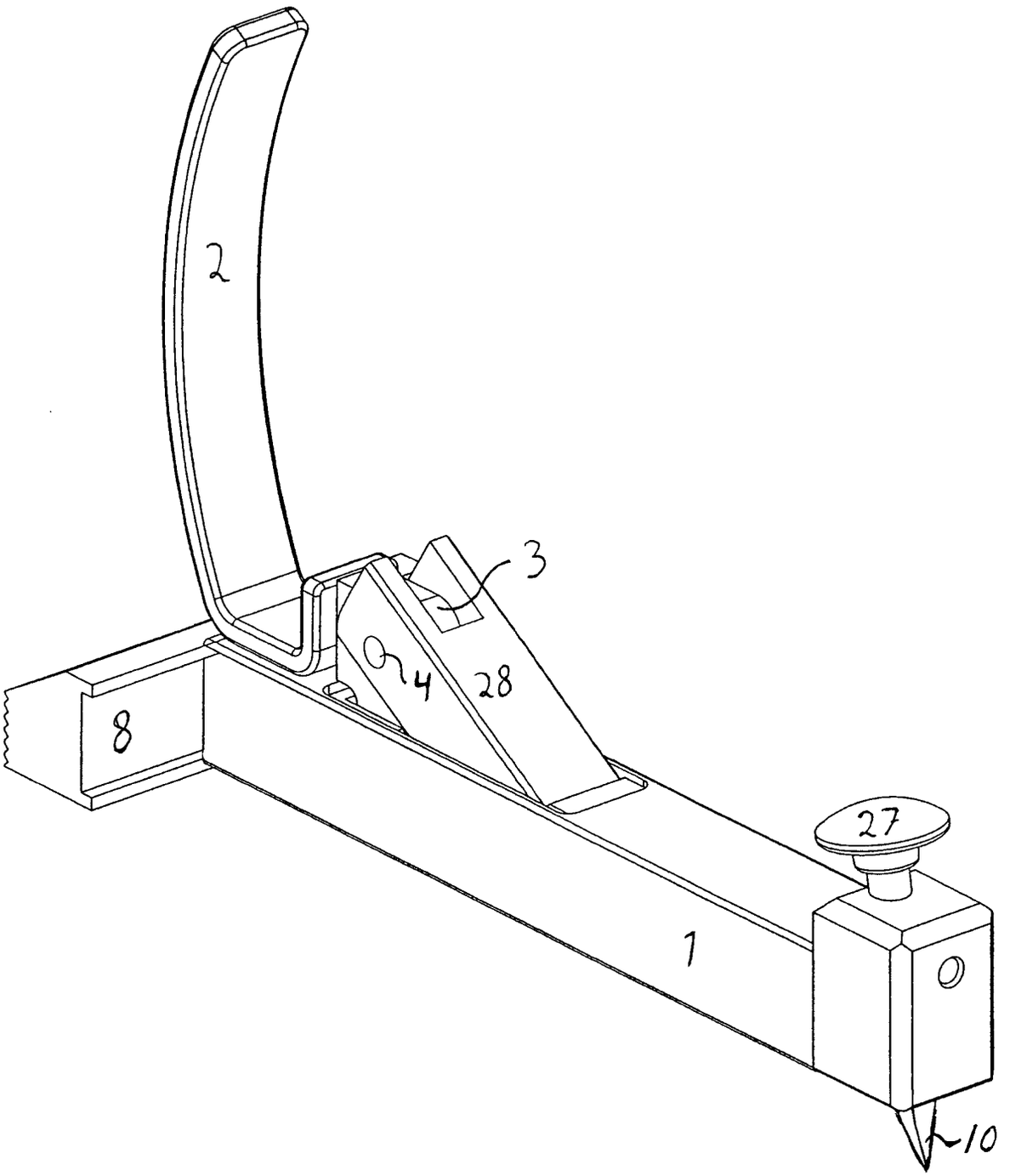

Fig. 3

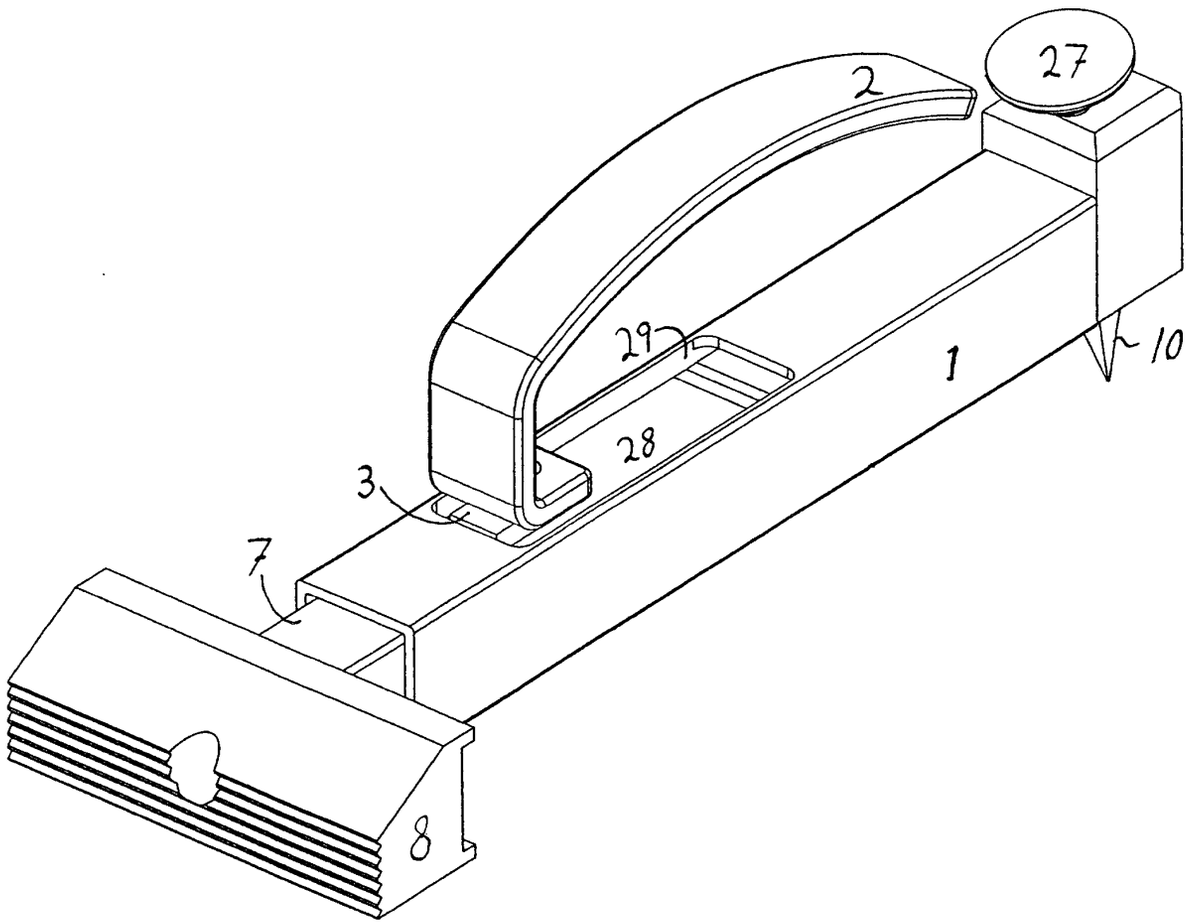

Fig. 4

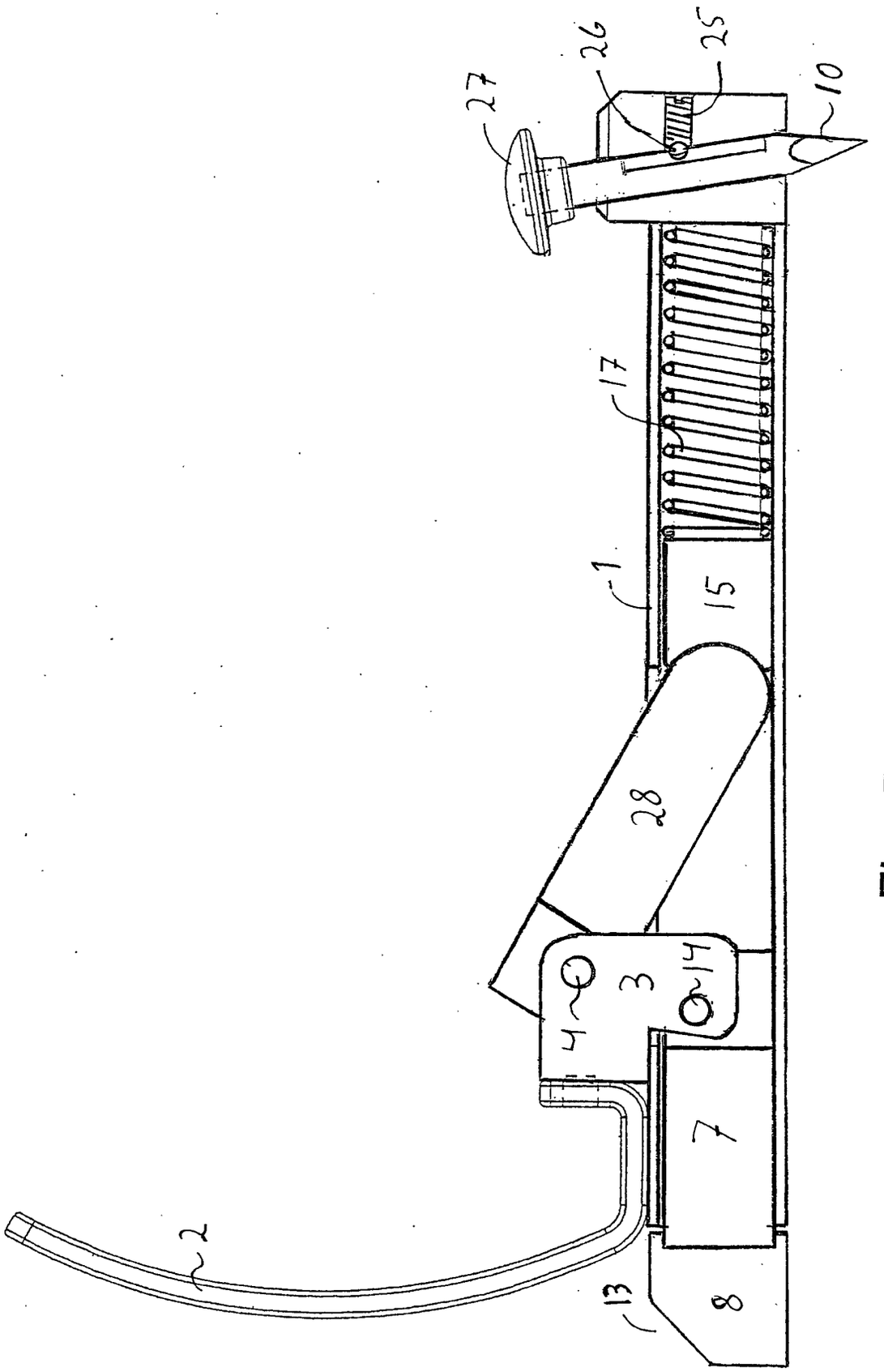

Fig. 5

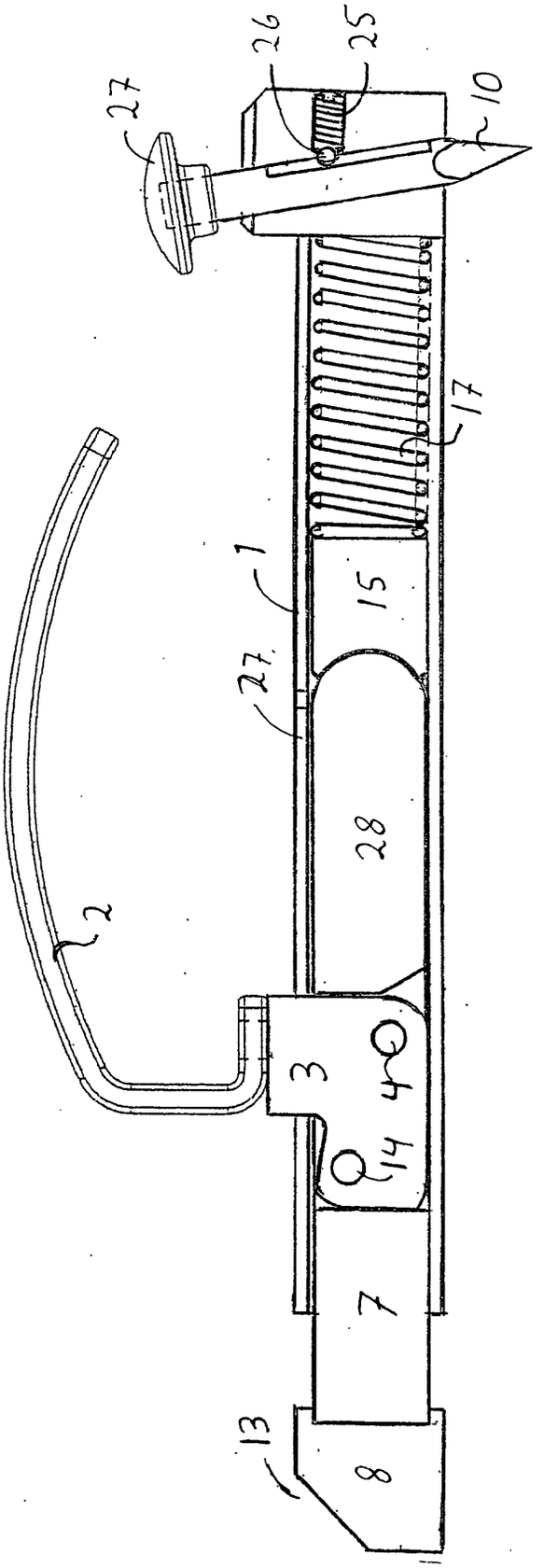

Fig. 6

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EUROPEAN SEARCH REPORT

Application Number
EP 02 44 5077

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.7)
X	US 1 618 896 A (TUBBS) 22 February 1927 (1927-02-22) * page 1, line 50 - line 95 * * page 2, line 33 - line 60 * * figures *	1-4	E04F21/22
A	US 1 851 489 A (BROOK) 29 March 1932 (1932-03-29) * page 1, line 89 - page 2, line 4 * * figure 2 * * figures 2,4 *	1,6	
A	US 534 590 A (WALLACE) 19 February 1895 (1895-02-19) * page 1, line 65 - line 83 * * figures 2,4 *	5	
A	US 3 524 623 A (CAMPBELL) 18 August 1970 (1970-08-18) * column 3, line 32 - line 43 * * figure 4 *	7	
			TECHNICAL FIELDS SEARCHED (Int.Cl.7) E04F B25B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	21 October 2002	Van Bost, S

CATEGORY OF CITED DOCUMENTS

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21-10-2002

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 1618896 A	22-02-1927	NONE	
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