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(54) Nailing machine, particularly for fixing portions of shoes

(57) A nailing machine, particularly for fixing portions of shoes, comprising a clamp body (11) that can be gripped with one hand by a user and forms a vise (12) for gripping a first portion (13) of material to be nailed; automatic means (15) for nailing the first portion (13) of material to be nailed to a second portion (14) of material to be nailed being arranged at the grip vise (12); the automatic nailing means (15) being rigidly coupled to the clamp body (11).

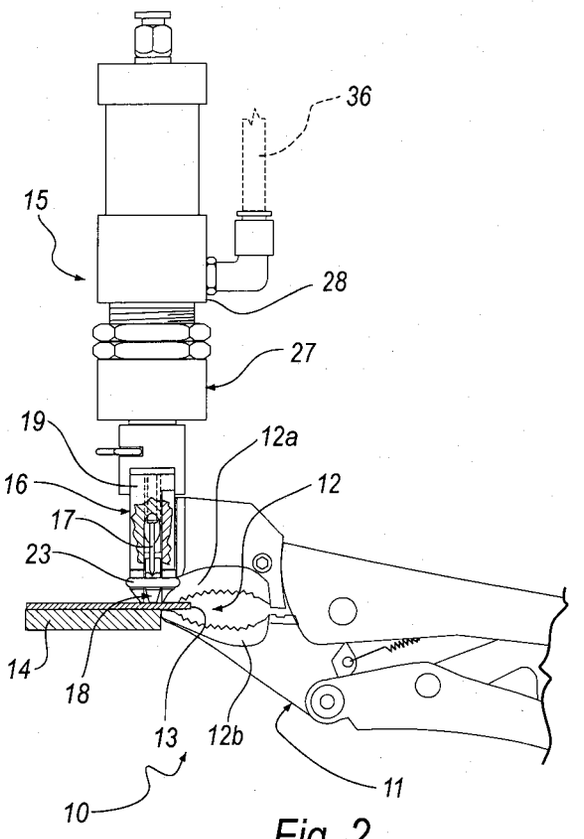

Fig. 2

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Description

[0001] The present invention relates to a nailing machine, particularly but not exclusively useful for mutually fixing portions of shoes.

[0002] Conveniently, the invention can also be applied in the field of leather goods, upholstery, furniture-making industries and other similar sectors.

[0003] Among the various systems used in shoes to fix portions of hide or fabric in general to leather mid-soles, soles, et cetera, one of the most ancient and widespread is the nailing of the two parts.

[0004] One typical method is, for example, the following.

[0005] After fixing one end of a portion of hide for example to the front portion of a leather mid-sole locked on an assembly insole, the operator, by means of tongs, stretches the opposite end of the portion of hide until it covers the rear region of the mid-sole.

[0006] Using his free hand, he takes a nail from a container and places its tip on the hide at the region to be nailed.

[0007] Using the same hand, he then picks up a hammer and strikes the nail.

[0008] It is evident that a system of this kind has many drawbacks.

[0009] A first drawback is that the operator must have a certain skill in placing the nail with just one hand, leave it free and then strike it trying to insert it with the appropriate angle.

[0010] Another drawback is that the nails in the containers are arranged haphazardly and the operator is forced to waste time to pick up the nails with the correct orientation.

[0011] For this reason, operators assigned to this kind of work historically tend to use their mouth as a container for the nails, keeping ready at all times a nail locked between their teeth with the correct orientation (set by the sensitivity of the mouth).

[0012] This practice is certainly dangerous both due to possible swallowing of the nails and due to the metallic dust that covers the nails and that the operators ingest. It is curious to notice, for example, that operators assigned to this kind of work mostly have, between their teeth, a gap caused by years of holding the nails and a sooty tongue and palate color.

[0013] The aim of the present invention is to provide a nailing machine that solves the drawbacks noted in the mutual fixing of portions of material by means of nails or the like, particularly in the field of shoes.

[0014] Within this aim, an object of the present invention is to provide a nailing machine, particularly for fixing portions of shoes, that allows to perform the operations more rapidly and easily with respect to current standards.

[0015] Another object of the present invention is to provide a nailing machine, particularly for fixing portions of shoes, that allows to avoid picking up nails or nailing elements in general from appropriately provided containers.

[0016] Another object of the present invention is to provide a nailing machine, particularly for fixing portions of shoes, that allows to nail portions of material with the aid of a single hand.

[0017] Another object of the present invention is to provide a nailing machine, particularly for fixing portions of shoes, that can be manufactured with known systems and technologies.

[0018] This aim and these and other objects that will become better apparent hereinafter are achieved by a nailing machine, particularly for fixing portions of shoes, characterized in that it comprises a clamp body that forms a vise for gripping at least one first portion of material to be nailed, automatic means for nailing said at least one first portion of material to be nailed to at least one second portion of material to be nailed being arranged at said grip vise, said automatic nailing means being rigidly coupled to said clamp body.

[0019] Further characteristics and advantages of the present invention will become better apparent from the following detailed description of a preferred but not exclusive embodiment thereof, illustrated by way of non-limiting example in the accompanying drawings, wherein:

Figure 1 is a general schematic view of a nailing machine according to the invention;
Figure 2 is a partially sectional side view of a portion of a nailing machine according to the invention;
Figure 3 is a partially sectional front view of a portion of a nailing machine according to the invention;
Figure 4 is a partially sectional side view of a portion of a nailing machine according to the invention during nailing.

[0020] With reference to the figures, a nailing machine according to the invention is generally designated by the reference numeral 10.

[0021] The nailing machine 10 comprises a clamp body 11, which forms a grip vise 12 for a first portion 13 of material to be nailed, such as for example a flap of hide to be fixed to a second portion 14 of material, such as a mid-sole (for example made of leather). The grip vise 12 is composed of an upper jaw 12a and a lower jaw 12b.

[0022] At the grip vise 12, on the clamp body 11 there are automatic means 15 for nailing the first portion 13 of material to the second portion 14 of material.

[0023] The automatic nailing means 15 comprise a device 16 for positioning a nailing element 17, such as for example a nail, in the nailing position.

[0024] The device 16 is rigidly coupled at its end to the grip vise 12 and in particular is fixed rigidly to the upper jaw 12a, and is provided with an opening 18 for the exit of the nailing elements 17 at the region in front of the grip vise 12.

[0025] The device 16 is constituted by a box-like body 19, inside which there is a channel 20 that passes through the entire box-like body 19 and leads outside through the opening 18 at the region in front of the grip vise 12.

[0026] The channel 20 is arranged substantially at right angles to the nailing plane.

[0027] Means 21 for closing and keeping in position (before the nailing step) the nailing element 17 are associated with the opening 18.

[0028] The means 21 for closing and keeping in position are constituted for example by two mutually opposite flaps 22, which are pivoted to the box-like body 19 and, when closed, prevent the nailing element 17 from escaping through the opening 18.

[0029] When the flaps 22 are closed, they act as a support for the pointed head of the nailing element 17.

[0030] The flaps 22 have oppositely arranged L-shapes, are pivoted at the long end of the L-shape, and are in contact with their other end.

[0031] An elastic element 23 is provided between the flaps 22 and keeps them in contact so as to close the opening 18.

[0032] The elastic element 23 is constituted by an elastic ring, which surrounds, on a plane that is perpendicular to the nailing direction, the mutually opposite flaps 22, keeping them closed in contact with each other; such elastic ring is arranged in corresponding slots 23a formed in the oppositely arranged flaps 22.

[0033] When the nailing element 17 is pushed in the nailing direction, as will become better apparent hereinafter, said element in turn pushes the flaps 22, opening them and exiting from the device 16 in order to be driven into the first and second portions 13 and 14 of material to be nailed.

[0034] Once the nailing element 17 has exited completely, the flaps 22 are moved back so as to close by the elastic element 23.

[0035] The nailing element 17 is thus accommodated in the channel 20 at the opening 18.

[0036] Upstream of the portion for accommodating the nailing element 17, the channel 20 splits laterally into a channel 24 for feeding nailing elements 17, which is orientated substantially so as to converge with respect to the nailing direction.

[0037] The positioning device 16 is associated with a magazine 25 of nailing elements 17, as described in greater detail hereinafter, by means of a flexible duct 26 for connection to the feeding channel 24.

[0038] The automatic nailing means 15 comprise, in addition to the positioning device 16 for the nailing element 17, means 27 for pushing the nailing element toward the portions 13 and 14 of material to be nailed.

[0039] The pusher means 27 are constituted, in this embodiment, by a pneumatic translational cylinder 28, which is fixed to the box-like body 19.

[0040] The pneumatic translational cylinder 28 has an actuation stem 29 that is inserted so that it can slide within the channel 20, in a position upstream of the nailing element 17 with respect to the opening 18.

[0041] The pusher means 27 are associated with a feeding system 30, which comprises a control 31 for operating the nailing machine 10 that is separate from the clamp body 11.

[0042] The operating control 31 is for example of the pedal type.

[0043] In other embodiments, the operating control can be constituted for example by a manual control and can be provided optionally on the clamp body.

[0044] In this embodiment, the feeding system 30 is constituted by a pneumatic system.

[0045] Advantageously, the clamp body 11 and the automatic nailing means 15 are fixed to a vertical elastic support 32, such as for example a cable 33 that exits from a pulley with controlled elastic winding 34, of a per se known type, which allows to suspend the clamp body 11 at a preset working height.

[0046] The pulley 34 with controlled elastic winding is fixed to the upper portion of a frame 35, on which the magazine 25 of nailing elements is further arranged.

[0047] The pneumatic feeding system 30 is arranged mainly on the frame 35 and is connected to the pusher means 27 by means of first hoses 36.

[0048] The pedal-type operation control 31 is also functionally connected by means of second hoses 37 to the feeding system 30.

[0049] A working surface 38 is also formed on the frame 35.

[0050] The magazine 25 of nailing elements is of a known type and comprises a trapdoor device (not shown in the figures), which allows correct orientation of the elements when they enter the flexible duct 26 for connection to the positioning device 16.

[0051] The operation of the machine is as follows.

[0052] The operator/user grips with one hand the clamp body 11, which grips, with its own jaws 12a and 12b, a flap of hide to be fixed for example to a leather mid-sole.

[0053] Such flap of hide is stretched until it covers the affected mid-sole region.

[0054] At this point, the operator, by pressing the pedal-operated control 31, makes the pneumatic system 30 lower the stem 29 of the pneumatic cylinder 28.

[0055] The stem 29 pushes the nailing element 17, which is arranged at the opening 18 of the positioning device 16, which in turn pushes the flaps 22, which prevented it from exiting, and opens them.

[0056] The nailing element 17 thus exits from the device 16 and is driven into the flap of hide and into the mid-sole.

[0057] The elastic ring 23 moves the flaps 22 so that they close.

[0058] Once the nailing element 17 has exited and the operator has released the pedal-operated control 31, the stem 29 rises, leaving in the channel 20 the space for a new nailing element 17, which descends by gravity

from the magazine 25 by means of the flexible duct 26.

[0059] In practice, it has been found that the invention thus described solves the drawbacks noted in the mutual fixing of portions of material by means of nails or the like, particularly in the field of shoes.

[0060] In particular, the present invention provides a nailing machine, particularly for fixing portions of shoes, that allows to perform operations for mutually fixing portions of shoes or the like more rapidly and simply with respect to current standards.

[0061] With the machine of the invention it is in fact possible to nail together portions of shoes without having to handle any nail, simply by arranging the portions to be nailed so that they are mutually adjacent and by operating the nailing means with one foot.

[0062] This avoids the operation for removing the nail from a container (or from one's mouth), orienting the nail and placing its tip on the upper portion to be nailed.

[0063] The invention thus conceived is susceptible of numerous modifications and variations, all of which are within the scope of the appended claims; all the details may further be replaced with other technically equivalent elements.

[0064] In practice, the materials employed, so long as they are compatible with the specific use, as well as the dimensions, may be any according to requirements and to the state of the art.

[0065] The disclosures in Italian Patent Application No. PD2003A000182 from which this application claims priority are incorporated herein by reference.

[0066] Where technical features mentioned in any claim are followed by reference signs, those reference signs have been included for the sole purpose of increasing the intelligibility of the claims and accordingly such reference signs do not have any limiting effect on the interpretation of each element identified by way of example by such reference signs.

Claims

1. A nailing machine, particularly for fixing portions of shoes, **characterized in that** it comprises a clamp body (11) that can be gripped with one hand by a user and forms a vise (12) for gripping at least one first portion (13) of material to be nailed, automatic means (15) for nailing said at least one first portion (13) of material to be nailed to at least one second portion (14) of material to be nailed being arranged at said grip vise (12), said automatic nailing means (15) being rigidly coupled to said clamp body (11).

2. The nailing machine according to claim 1, **characterized in that** said automatic nailing means (15) comprise a device (16) for positioning a nailing element (17) in the nailing position and means (27) for pushing said nailing element (17) in the direction of said portions (13, 14) of material to be nailed, a magazine (25) of nailing elements (17) being associated with said positioning device (16).

3. The nailing machine according to claim 2, **characterized in that** said pusher means (27) are associated with a feeding system (30), which comprises a control (31) for operating said nailing machine (10) that is separate from said clamp body (11).

4. The nailing machine according to claim 3, **characterized in that** said operation control (31) is of the pedal type.

5. The nailing machine according to claim 4, **characterized in that** said feeding system (30) is pneumatic.

6. The nailing machine according to one or more of the preceding claims, **characterized in that** said grip vise (12) is composed of an upper jaw (12a) and a lower jaw (12b), said positioning device (16) being rigidly coupled to said upper jaw (12a), said positioning device (16) further having an exit opening (18) for said nailing element (17) at the region in front of said grip vise (12).

7. The nailing machine according to claim 6, **characterized in that** said positioning device (16) is constituted by a box-like body (19) inside which there is a channel (20) that passes through the entire box-like body (19) and exits outside through said opening (18), said nailing element (17) being accommodated inside said channel (20), means (21) for closing and keeping in position said nailing element (17) being associated with said opening (18).

8. The nailing machine according to claim 7, **characterized in that** said means (21) for closing and keeping in position said nailing element (17) are constituted by two mutually opposite flaps (22), which are pivoted to said box-like body (19) and which, when closed, prevent said nailing element (17) from exiting through said opening (18), an elastic return element (23) for closing said opening (18) being provided between said flaps (22).

9. The nailing machine according to claim 8, **characterized in that** said flaps (22) have mutually opposite L-shapes, are pivoted at the long end of the L-shape, and are in contact by means of their other end, said elastic element (23) being constituted by an elastic ring that surrounds said opposite flaps (22) on a plane that is perpendicular to the nailing direction, keeping them closed in contact with each other, said elastic ring being arranged in corresponding slots (23a) formed in said mutually opposite flaps (22).

10. The nailing machine according to one or more of the preceding claims, **characterized in that** said channel (20), upstream of the portion for accommodating said nailing element (17), splits laterally into a channel (24) for feeding other nailing elements (17) which is orientated so as to converge substantially with respect to the nailing direction.

11. The nailing machine according to claim 10, **characterized in that** said positioning device (16) is associated with said magazine (25) of nailing elements by means of a flexible duct (26) for connection to the feeding channel (24).

12. The nailing machine according to one or more of the preceding claims, **characterized in that** said pusher means (27) are constituted by a pneumatic translational cylinder (28), which is fixed to said box-like body (19), the actuation stem (29) of said translational cylinder (28) being inserted so that it can slide in said channel (20), in a position located upstream of said nailing element (17) with respect to said opening (18).

13. The nailing machine according to one or more of the preceding claims, **characterized in that** said clamp body (11) and said automatic nailing means (15) are fixed to a vertical elastic support (32), which in turn is fixed to the upper portion of a frame (35), on which said magazine (25) of nailing elements is further arranged.

14. The nailing machine according to claim 13, **characterized in that** said feeding system (30) is arranged mainly on said frame (35) and is connected to said pusher means (27) by means of first hoses (36).

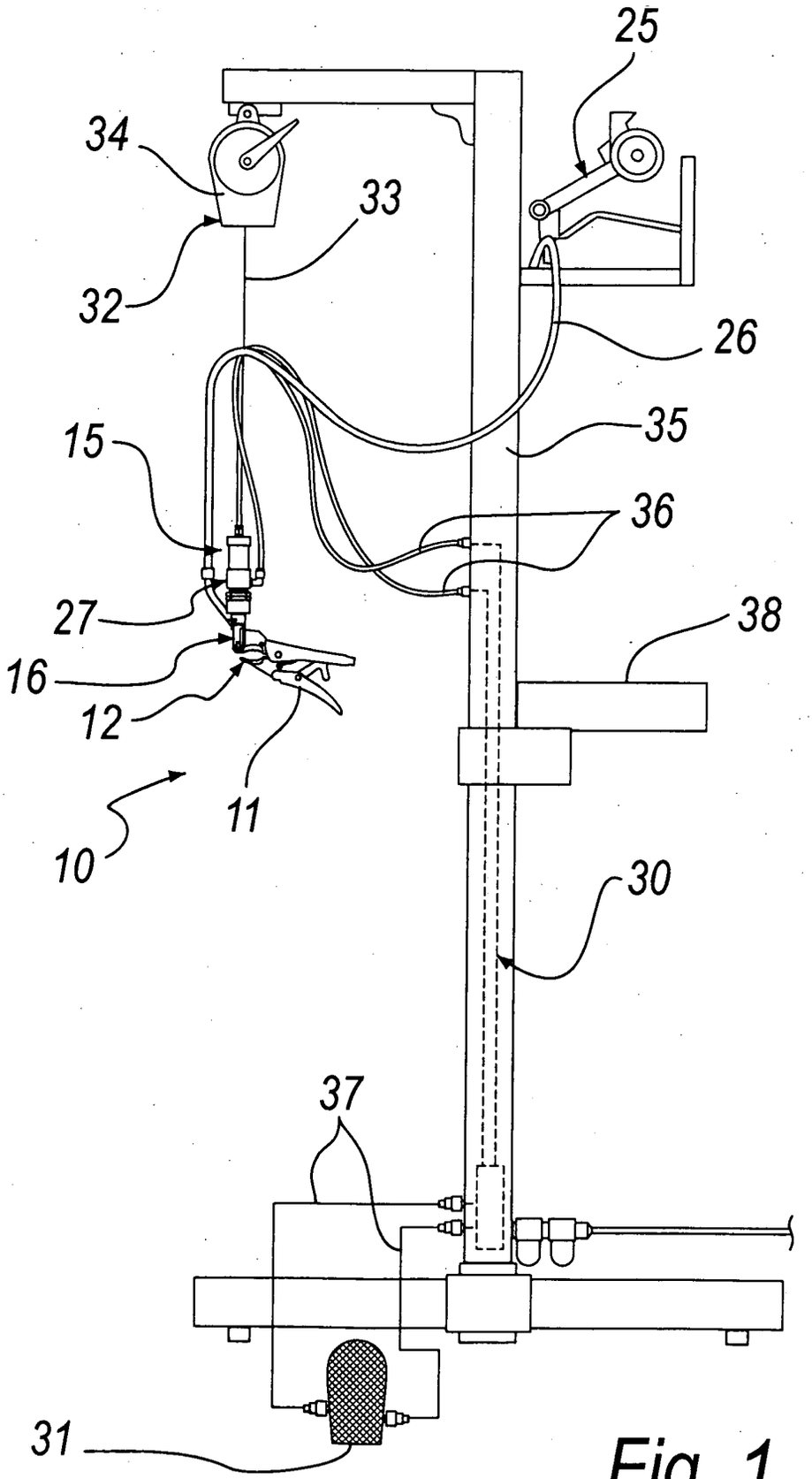

Fig. 1

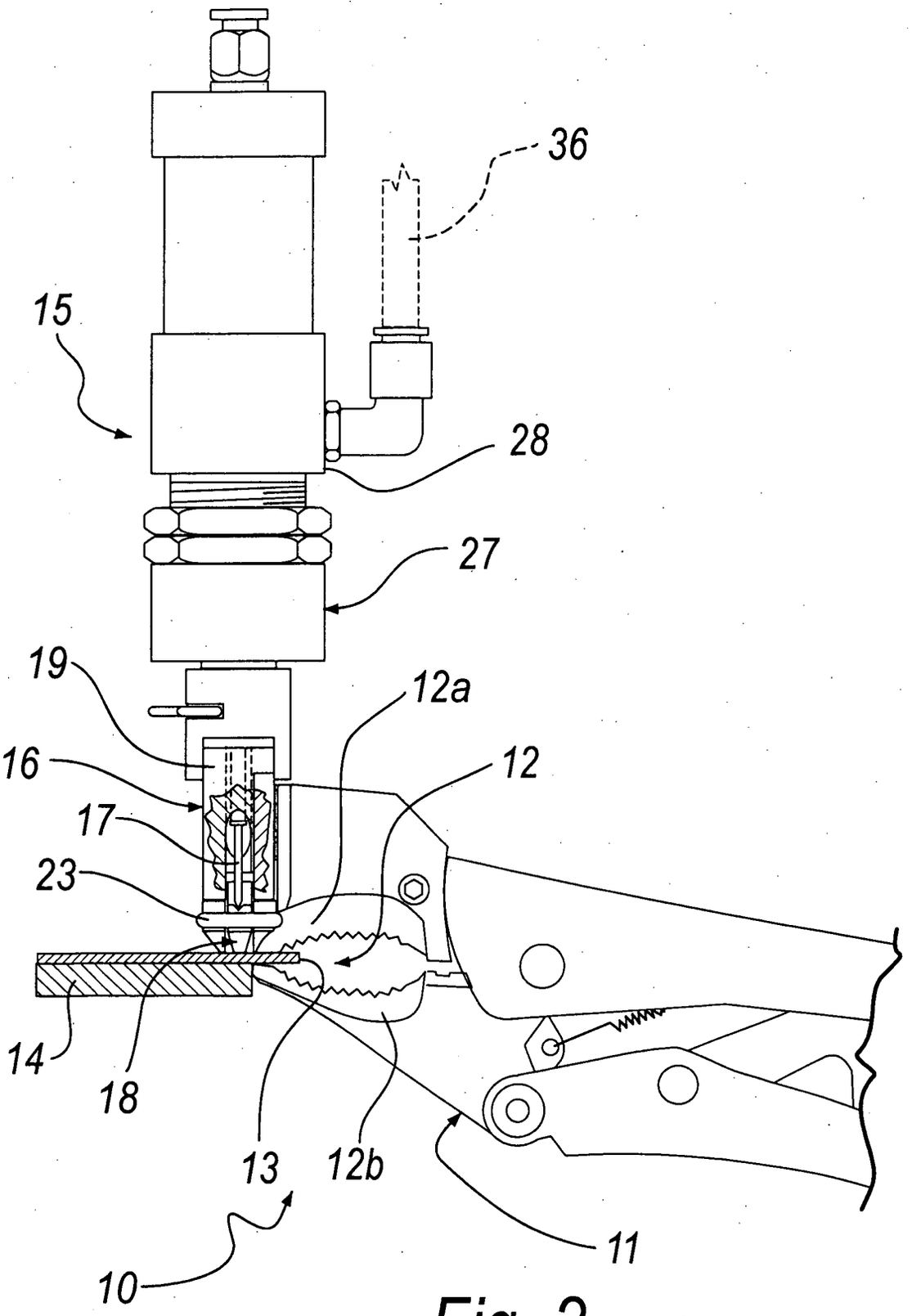

Fig. 2

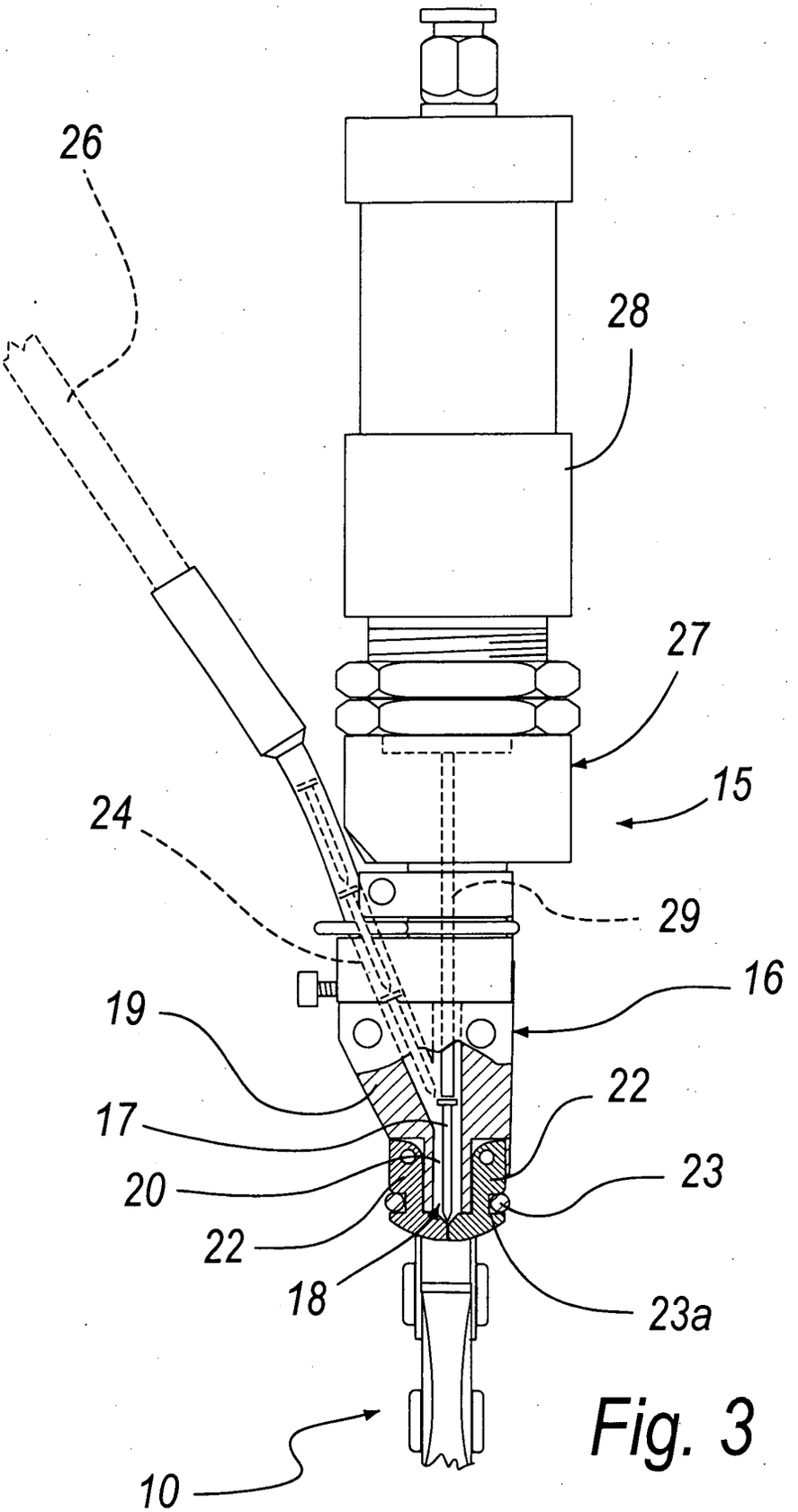

Fig. 3

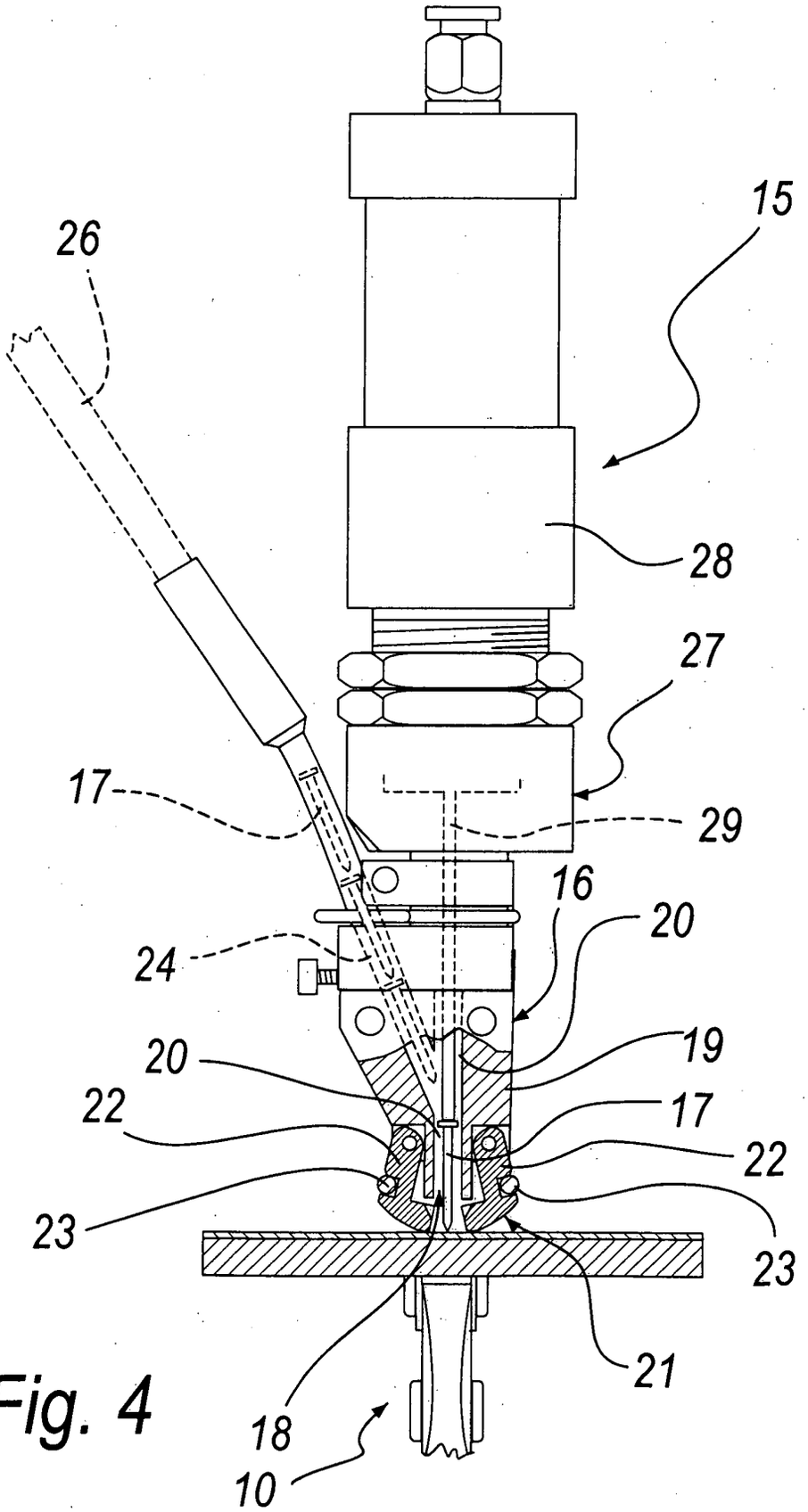

Fig. 4

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 04 01 7863

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)
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X	US 1 421 655 A (ZIEGLER CHARLES F) 4 July 1922 (1922-07-04) * claims; figure *	1	
A	US 1 542 946 A (LAWSON OSCAR L) 23 June 1925 (1925-06-23) * claims; figures *	1	
A	GB 18091 A A.D. 1910 (GODDU GEORGE) 1 December 1910 (1910-12-01) * claims; figures *	1	
A	FR 2 101 471 A (BASTIN JEAN PIERRE) 31 March 1972 (1972-03-31) * the whole document *	1	TECHNICAL FIELDS SEARCHED (Int.Cl.7) B25C A43D

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
MUNICH	17 November 2004	Herry, M

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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