

(19)



(11)

EP 3 175 953 A1

(12)

EUROPEAN PATENT APPLICATION
published in accordance with Art. 153(4) EPC

(43) Date of publication:

07.06.2017 Bulletin 2017/23

(51) Int Cl.:

B25B 13/16 (2006.01) **B25B 13/30** (2006.01)
B25B 13/50 (2006.01)

(21) Application number: **14898619.3**

(86) International application number:

PCT/ES2014/070614

(22) Date of filing: **29.07.2014**

(87) International publication number:

WO 2016/016480 (04.02.2016 Gazette 2016/05)

(84) Designated Contracting States:

**AL AT BE BG CH CY CZ DE DK EE ES FI FR GB
GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO
PL PT RO RS SE SI SK SM TR**

Designated Extension States:

BA ME

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(54) **PIPE WRENCH**

(57) The invention relates to a wrench comprising a moving jaw (1) attached to a handle (3) and pivotably connected to a first end of a stop element (5), where a fixed jaw (2) is movable within the handle (3), where a second end of the stop element (5) surrounds a lever arm (7) of the fixed jaw (2), where the position of the moving jaw (1) with respect to the fixed jaw (2) is adjustable by means of the stop element (5) coming into contact with a control element (6) the position of which can be adjusted and fixed with respect to the lever arm (7), where the control element (6) comprises a nut (9) having a

threaded zone and housing a pushing element (12) that can occupy a first position, in which an elastic element (11) pushes the pushing element (12) against the lever arm (7), preventing the movement thereof with respect to the control element (6), and a second position in which the pushing element (12) is actuated against the elastic element (11) such that the pushing element (12) does not come into contact with the lever arm (7), allowing relative movement of said lever arm (7) with respect to the control element (6).

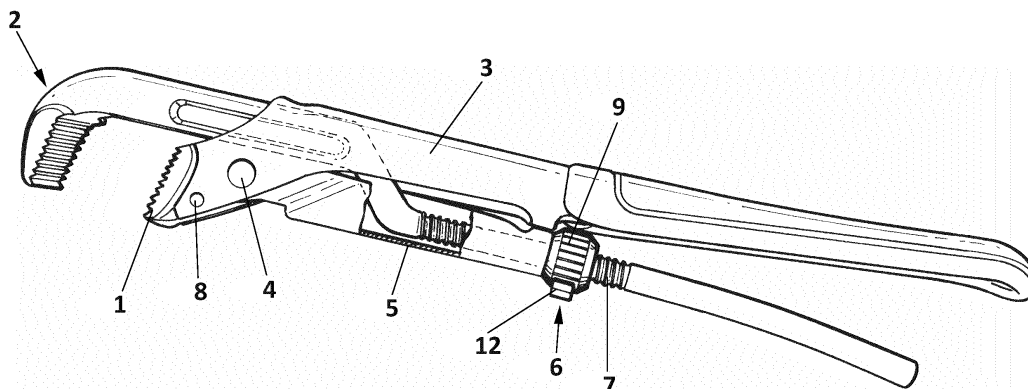


FIG. 1

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Description

Technical Field of the Invention

[0001] The present invention relates to a pipe wrench, being applicable in the tool industry, and more specifically in the field of adjustable wrenches, which allows a quick and safe control of the opening of the mouth of the wrench to transition from a certain dimension to another one different from the first in an immediate and effective manner, without having to adjust the wrench by means of operating a conventional worm screw.

Background of the Invention

[0002] Pipe wrenches, also referred to as jaw wrenches or Stillson wrenches, are known today in the field of adjustable wrenches.

[0003] To control and adjust the opening of the mouth of the jaws to each measurement of pipe on which they are going to be used, these wrenches comprise an adjustable worm nut which has to be turned by the user to change the opening of the jaw until reaching the required position.

[0004] In certain cases, said nut works like a spindle nut that travels along the threaded zone of a stem or lever arm acting as a clamping lever, located at the end of one of the jaws, usually a fixed jaw.

[0005] Control of the opening of the mouth of the jaws is achieved by means of threading the nut in one direction or the other along the threaded zone of the lever arm. A stop part articulated to the moving jaw thereby comes into contact with said nut, which determines the opening of the mouth depending on the position in which said jaw is located.

[0006] The main drawback of adjustable wrenches of this type results from the fact that the operation for the user to move the nut along the threaded zone of the lever arm requires a certain amount of time, in addition to being somewhat uncomfortable to do. This drawback is particularly clear in the case of someone having to make successive changes between mouth opening positions that are different from one another, i.e., when the wrench has to be used successively with pipes having very different diameters, with the subsequent loss of time and the cost that this entails.

Description of the Invention

[0007] The present invention relates to a pipe wrench, also referred to as a Stillson wrench or jaw wrench, which allows moving the control element for controlling the wrench opening position much more quickly and easily than in the case of wrenches existing today.

[0008] The wrench proposed by the invention comprises a moving jaw and a fixed jaw. The moving jaw is attached to a preferably metal handle having a U-shaped section. These jaws are also commonly referred to as

levers.

[0009] Furthermore, the moving jaw is pivotably connected, for example by means of a pin, shaft or the like, to a first end of a stop element also having a U-shaped section.

[0010] An upper part of the fixed jaw, i.e., the part comprising the pipe gripping area, is movable within the handle, specifically between the arms or walls of the U shape, as usually occurs in adjustable wrenches of this type.

[0011] A second end of the stop element circumferentially surrounds a stem or lever arm of the fixed jaw, surrounding it at least partially but enough so as to not allow it to come out, such that the position of the moving jaw with respect to the fixed jaw is adjustable by means of the stop element coming into contact with a control element the position of which can be adjusted and fixed with respect to a threaded segment of the lever arm. Therefore, during the use of the wrench, said second end of the stop element rests on the control element, the position of which is fixed to the lever arm in said situation.

[0012] According to the invention, the control element comprises a nut having a threaded zone and at least partially housing a pushing element that can occupy a first position in which an elastic element pushes the pushing element against the lever arm, preventing relative movement of said lever arm with respect to the control element.

[0013] Likewise, the pushing element can occupy a second position in which the pushing element is actuated, understood to be externally actuated by a user, against the elastic element such that the pushing element does not come into contact with the lever arm, allowing relative movement of said lever arm with respect to the control element.

[0014] A quick and easy release and fixing between the control element and the lever arm is thereby achieved, which allows quickly changing the opening of the mouth of the jaws by the user simply pushing the pushing element.

[0015] The possibility that the pushing element transitions from the first position to the second position in a linear manner, making actuation thereof easier for the user, is contemplated.

Description of the Drawings

[0016] To complement the description that is being made and for the purpose of helping to better understand the features of the invention according to a preferred practical embodiment thereof, a set of drawings is attached as an integral part of said description, in which the following is depicted with an illustrative and non-limiting character:

Figure 1 shows an elevational view of a preferred embodiment of the wrench of the invention, with the jaws closed and the control element in a lower position with respect to the lever arm, such that the open-

ing of mouth that is allowed for said wrench is a maximum opening.

Figure 2 shows an elevational view like that of Figure 1, in which the control element is located in a higher position with respect to the lever arm, such that the opening of mouth that is allowed the wrench is a minimum opening.

Figure 3 shows a perspective view and a longitudinal section of a preferred embodiment of the control element of the wrench of the invention.

Figure 4 shows an exploded perspective view of the control element shown in Figure 3.

Preferred Embodiment of the Invention

[0017] In view of the described drawings, it can be seen how in one of the possible embodiments of the invention, the pipe wrench proposed by the invention comprises a moving jaw (1) and a fixed jaw (2). The moving jaw (1) is attached to a handle (3) having a U-shaped section. The moving jaw (1) is pivotably connected, by means of a pin (4), to a first end of a stop element (5) also having a U-shaped section. An upper part of the fixed jaw (2) is movable within the handle (3), specifically between the arms or walls of the U shape. A second end of the stop element (5) circumferentially surrounds a lever arm (7) of the fixed jaw (2) enough so as to not allow it to come out, such that the position of the moving jaw (1) with respect to the fixed jaw (2) is adjustable by means of the stop element (5) coming into contact with a control element (6) the position of which can be adjusted and fixed with respect to the lever arm (7). During use of the wrench, said second end of the stop element (5) rests on the control element (6), the position of which is fixed to the lever arm (7) in said situation.

[0018] According to the invention, the control element (6) comprises a pushing element (12) that can occupy a first position in which an elastic element (11) pushes the pushing element (12) against the lever arm (7), preventing relative movement of said lever arm (7) with respect to the control element (6).

[0019] Furthermore, the pushing element (12) can occupy a second position in which the pushing element (12) is actuated, understood to be externally actuated by a user, against the elastic element (11) such that the pushing element (12) does not come into contact with the lever arm (7), allowing relative movement of said lever arm (7) with respect to the control element (6).

[0020] The solution is a control element (6) having a button-like pushing element (12) which, when pushed, cancels or prevents contact of the control element with the lever arm (7), such that the control element (6) can be moved freely at that time along the lever arm (7). When the pushing element (12) is released, the control element (6) and the lever arm (7) come back into contact with each other such that their position is fixed, blocking the movement thereof.

[0021] As can be seen in the embodiment depicted in

the drawings, and as can be inferred from the section of Figure 3, the pushing element (12) transitions from the first position to the second position in a linear manner.

[0022] In the depicted preferred embodiment, the elastic element (11) is a spring, specifically a compression spring.

[0023] Furthermore, in said embodiment the pushing element (12) surrounds the lever arm (7) and fits by means of a side opening (10) in a nut (9) having a cylindrical configuration likewise surrounding the lever arm (7), such that the elastic element (11) acts internally between an inner surface of said nut (9) and an outer surface of said pushing element (12). Preferably, an inner surface of the pushing element (12), of the nut (9) and the lever arm (7) itself are threaded.

[0024] For a better explanation of how wrenches of this type work, the fixed jaw (2), comprising an upper part in which the pipe gripping area is located, where said upper part is integral with the lever arm (7), which in turn has a threaded lower segment, can be seen in the drawings. Likewise, lever arm (7) and upper part can be independent parts attached to one another by welding for example.

[0025] On the other hand, the moving jaw (1) is attached by at least one rivet (8) to the side walls of a handle (3) having a U-shaped section. According to a preferred embodiment, the handle (6) can be formed by a flat metal bar bent to obtain the U-shaped cross-section.

[0026] Likewise, though not seen in the drawings, to improve the distribution of stresses in the tool, it is contemplated that the moving jaw (1) comprises a lug located between the walls of the stop element (5), for which purpose the lug has a hole adapted for receiving the pin (4) serving as connecting means. In the zone adjacent to the hole, the moving jaw (1) comprises support surfaces on which rounded ends of the stop element (5) rest, such that when the pipe wrench is being used, the force applied by the user on the moving jaw (1) is substantially distributed at said rounded ends, thereby relieving the strain supported by the pin (4) itself and the handle (3) of the moving jaw (1).

[0027] In view of this description and set of drawings, the person skilled in the art will understand that the embodiments of the invention that have been described can be combined in multiple ways within the scope of the invention. The invention has been described according to several preferred embodiments thereof, but for the person skilled in the art it will be obvious that many variations can be introduced in said preferred embodiments without exceeding the scope of the claimed invention.

Claims

1. Pipe wrench comprising a moving jaw (1) and a fixed jaw (2), said moving jaw (1) being attached to a handle (3) having a U-shaped section and pivotably connected to a first end of a stop element (5) also having a U-shaped section, where an upper part of the fixed

jaw (2) is movable within the handle (3), where a second end of the stop element (5) circumferentially surrounds a lever arm (7) of the fixed jaw (2), where the position of the moving jaw (1) with respect to the fixed jaw (2) is adjustable by means of the stop element (5) coming into contact with a control element (6) the position of which can be adjusted and fixed with respect to a threaded segment of the lever arm (7), **characterized in that** the control element (6) comprises a nut (9) having a threaded zone and at least partially housing a pushing element (12) that can occupy a first position, in which an elastic element (11) pushes the pushing element (12) against the lever arm (7), preventing relative movement of said lever arm (7) with respect to the control element (6), and a second position in which the pushing element (12) is actuated against the elastic element (11) such that the pushing element (12) does not come into contact with the lever arm (7), allowing relative movement of said lever arm (7) with respect to the control element (6).

2. Wrench according to claim 1, wherein the pushing element (12) transitions from the first position to the second position in a linear manner.
3. Wrench according to any of the preceding claims, wherein the elastic element (11) is a spring.
4. Wrench according to any of the preceding claims, wherein the pushing element (12) surrounds the lever arm (7) and fits by means of a side opening (10) in a nut (9) having a cylindrical configuration likewise surrounding the lever arm (7), such that the elastic element (11) acts internally between an inner surface of said body (9) and an outer surface of said pushing element (12).

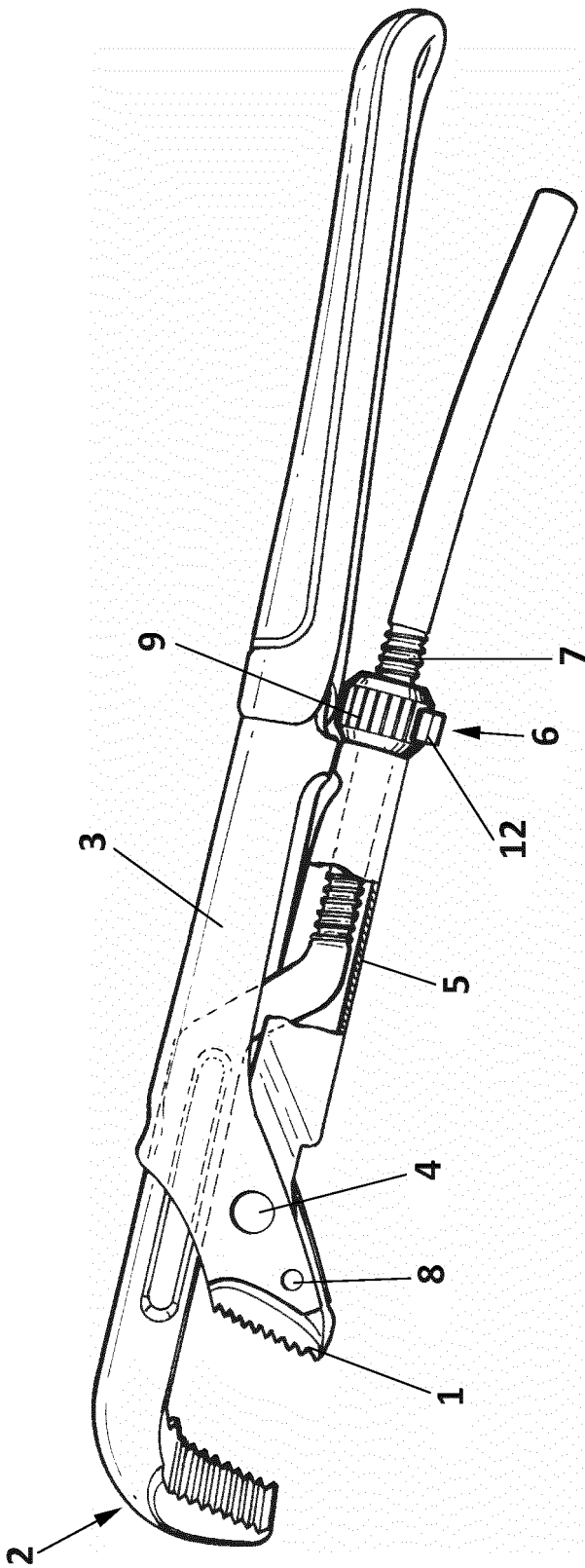


FIG. 1

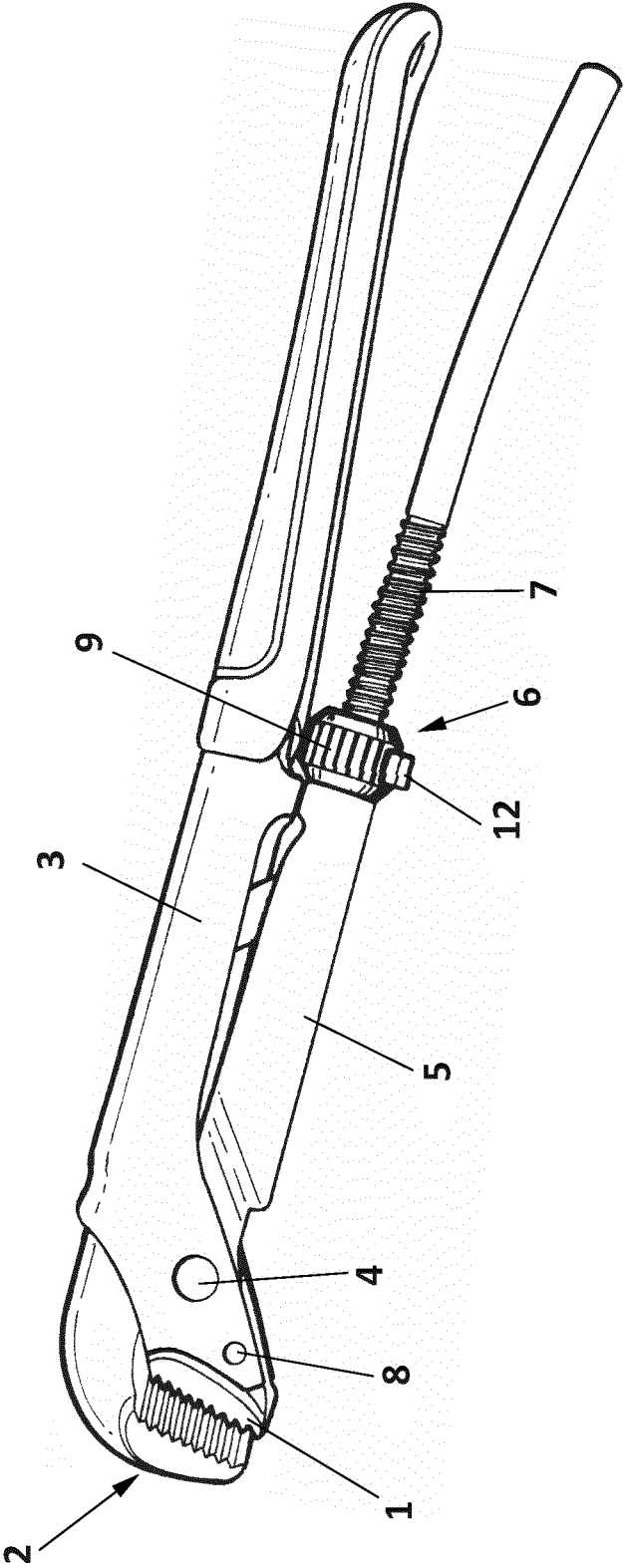


FIG. 2

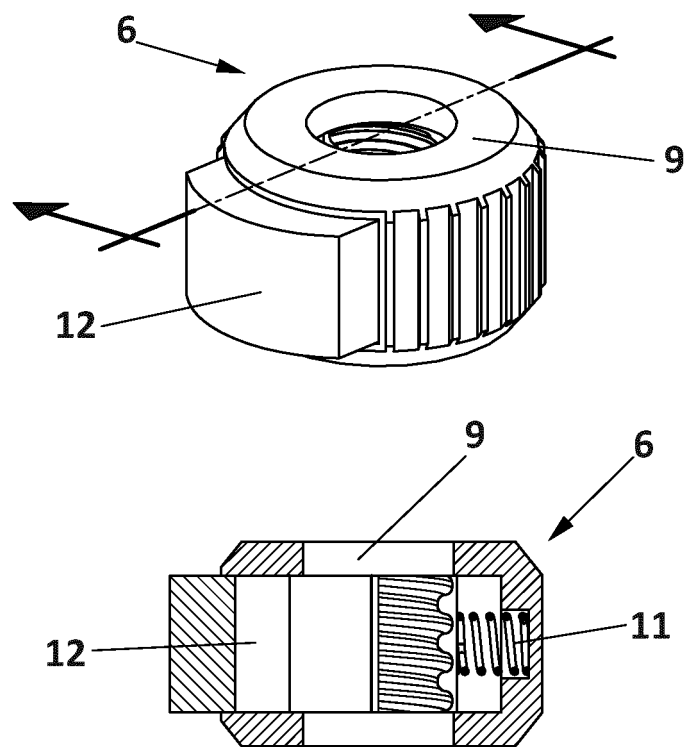


FIG. 3

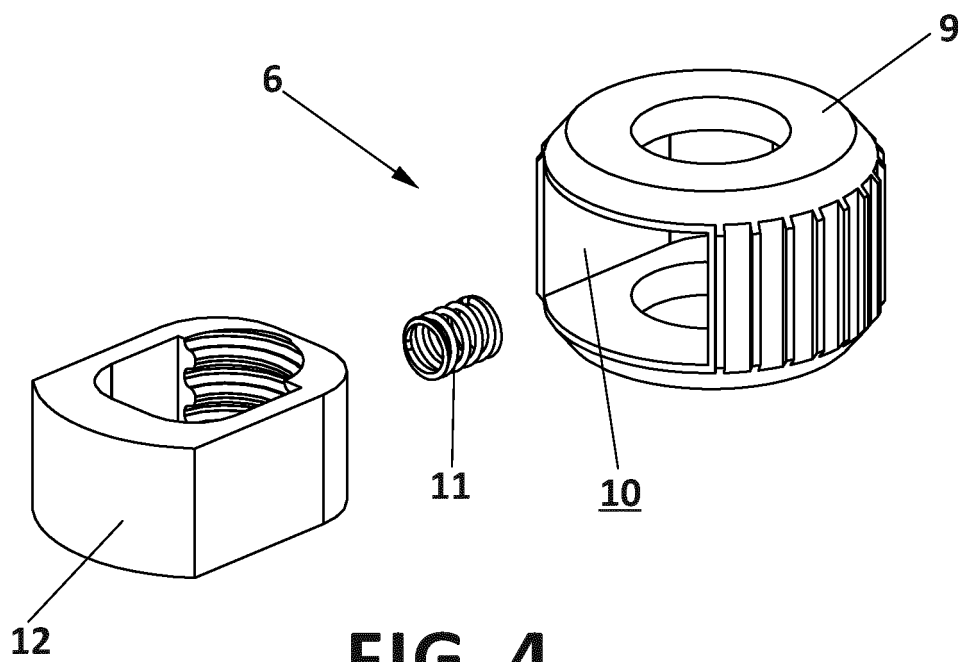


FIG. 4

INTERNATIONAL SEARCH REPORT

International application No.

PCT/ES2014/070614

A. CLASSIFICATION OF SUBJECT MATTER

See extra sheet

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)

B25B

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)

EPODOC

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	DE 3513556 A1 (LEIPOLD DIETER) 16/10/1986, pages 3 - 5; figures 1 - 5.	1-4
Y	GB 190819604 A (BIBB SAMUEL ET AL.) 10/06/1909, page 2, lines 23 - 47; figures 1 - 5.	1-4
A	ES 227718U U (DAKO WERKZEUGFABRIKEN DAVID KOTTHAUS KG) 16/05/1977, the whole document.	1-4
A	FR 957617 A (JEAN JOSEPH PIERRE) 23/02/1950, the whole document.	1-4
A	GB 190722689 A (KAHLE DORSEY PERDUE) 13/02/1908, the whole document.	1-4
A	DE 29503519U U1 (GEDORE WERKZEUGFAB O DOWIDAT) 01/06/1995, the whole document.	1-4

☐ Further documents are listed in the continuation of Box C.☒ See patent family annex.

* Special categories of cited documents:

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"P" document published prior to the international filing date but later than the priority date claimed

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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 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
17/04/2015Date of mailing of the international search report
(21/04/2015)

Name and mailing address of the ISA/

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Form PCT/ISA/210 (second sheet) (July 2009)

INTERNATIONAL SEARCH REPORT

International application No.

Information on patent family members

PCT/ES2014/070614

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DE29503519U U1	01.06.1995	NONE	

Form PCT/ISA/210 (patent family annex) (July 2009)

INTERNATIONAL SEARCH REPORT

International application No.

PCT/ES2014/070614

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CLASSIFICATION OF SUBJECT MATTER

B25B13/16 (2006.01)

B25B13/30 (2006.01)

B25B13/50 (2006.01)

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