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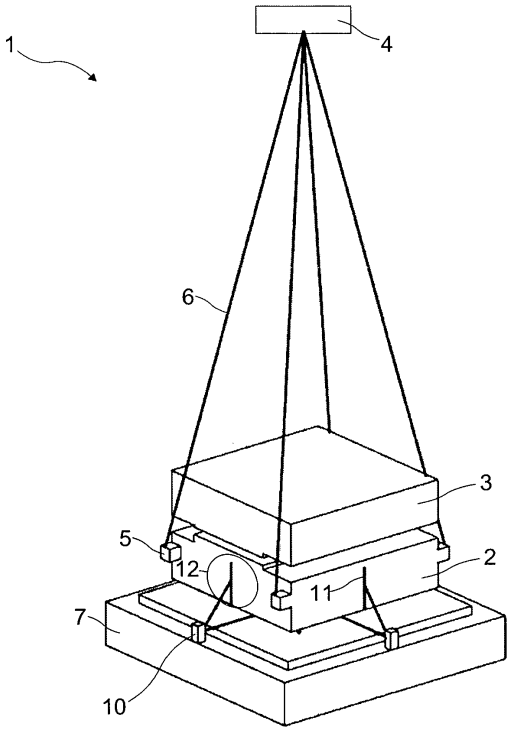
(54) A press-die positioning system

(57) The present invention relates to a press-positioning system (1) which enables the die to be accurately placed on the press bolster and helps to perform pressing operation accurately, and which also comprises a laser (10) that is mounted on the bolster (7) and produces a beam towards the lower die (2).

FIG. 1



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Description

Field of the Invention

[0001] The present invention relates to a press-die positioning system which facilitates aligning the referencing holes on the die and the conical pins on the press bolster on top of one another.

Background of the Invention

[0002] Sheet metals are shaped in the dies by means of the press. When more than one kind of sheet metal parts are preferred to be shaped on a production line, the dies on the line should be changed. Hence, the dies are placed on the press bolster by the help of a crane, and when it is being placed, the referencing holes on the die and the conical pins on the press bolster are aligned on top of one another. This way, after the press bolsters move the dies towards the production line, the die is placed correctly on the production line. When the dies are being placed on the production line by the help of a crane, a difficulty is encountered during aligning the referencing holes on the die and the conical pins on the press bolster on top of one another due to the decrease in the angle of vision. If the alignment fails, the die will not be placed on the press bolster accurately and thus this will cause failure to shape the sheet metal accurately as well as damaging of the referencing holes, conical pins, the die and the press bolster. Especially, the requirements of decreasing lot numbers, increasing die changing frequency and reducing set up times, increase the need for speeding up and facilitating die centering.

[0003] The Japanese patent document no. JPH0839153 (A), an application in the state of the art, discloses a device which enables to decrease the errors of distance and radius by marking a workpiece via laser beam. The workpiece (W) is placed on a lower metal mold (7). The cross width of the workpiece (W) is roughly adjusted to the cross width of the upper metal mold (9). The device includes a laser irradiation device (21) and a laser nozzle (23). The angle of the laser nozzle (23) is adjusted according to the S-S line which is at the working center of the upper metal mold (9). The laser irradiation device (21) is located alongside an upper bolster and a lower metal mold (7).

[0004] The Chinese utility model document no. CN201128278 (Y), an application known in the state of the art, discloses a laser marking machine used in casting. Marking during arranging the sand core is performed by the laser radiating position of the laser marking machine. During use, firstly the sand core is arranged on the work bench, and then the laser marking machine is set, and the marking button is pressed. The laser marking machine emits large-power laser beams. The laser beams are radiated on the sand core. The invention has the advantages of high speed, high automation degree, clear font, neatness, good standardization, and ability to reduce the labor intensity.

Summary of the Invention

[0005] The objective of the present invention is to provide a press-die positioning system which enables to place the die onto the press bolster.

[0006] Another objective of the present invention is to provide a press-die positioning system which helps to perform pressing operation accurately.

Detailed Description of the Invention

[0007] The press-die positioning system developed to fulfill the objective of the present invention is illustrated in the accompanying figures, in which:

Figure 1 is the perspective view of the press-die positioning system.
Figure 2 is the perspective view of the press-die positioning system to which a laser device is incorporated.
Figure 3 is the perspective view of the press-die positioning system from the bottom part.
Figure 4 is the perspective view of the press-die positioning system from another angle.

[0008] The components shown in the figures are each given reference numbers as follows:

1. Press-die positioning system
2. Lower die
3. Upper die
4. Crane
5. Lifting lug
6. Rope
7. Bolster
8. Referencing hole
9. Conical pin
10. Laser
11. Guiding line
12. Light region

[0009] The press-die positioning system (1), which facilitates aligning the referencing holes on the die and the conical pins on the press bolster on top of one another, basically comprises

- at least one lower die (2) which is used to shape the sheet metal,
- at least one upper die (3) which is placed on the lower die (2) and shapes the sheet metal placed between the lower die (2) and itself as a result of the pressure it applies,
- at least one crane (4) which enables the lower die (2) and the upper die (3) to be carried as preferred,
- at least one lifting lug (5) which is provided on the lower die (2) to enable the lower die (2) and the upper

die (3) to be lifted by a crane (4),
- at least one rope (6) which enables connection of the lower die (2) and the upper die (3) with the crane (4),
- at least one bolster (7) on which the lower die (2) and the upper die (3) are arranged,
- at least one referencing hole (8) which is located on the bottom part of the lower die (2) and drilled into the lower die (2),
- at least one conical pin (9) which is formed on the bolster (7) and fits into the referencing hole (8), and which thus enables the lower die (2) to be placed on the bolster (7) in an aligned manner,
- at least one laser (10) which is mounted on the bolster (7) and which produces a beam towards the lower die (2),
- at least one guiding line (11) which is drawn on the side surface of the lower die (2),
- at least one light region (12) which encompasses the region where the guiding line (11) is located on the lower die (2).

[0010] In the press-die positioning system (1) in one embodiment of the invention, a lower die (2) and an upper die (3) are provided with the purpose of shaping sheet metals. The lower die (2) is arranged on a bolster (7). There are referencing holes (8) provided on the bottom part of the lower die (2) and conical pins (9) provided on the bolster (7) fit into these referencing holes (8). It comprises two dies namely lower die (2) and upper die (3). In order for the lower die (2) and the upper die (3) to enter the production line, lower die (2) should be lifted from the lifting lugs (5) on the sides thereof by the ropes (6) by the help of the crane (4) and arranged on the bolster (7), and then the bolster (7) should move the lower die (2) and the upper die (3) towards the production line. During this arrangement, the referencing holes (8) on the bottom part of the lower die (2) are aligned with the conical pins (9) on the bolster (7) on top of one another to enable accurate placement. There are at least two of these conical pins (9) and the referencing holes (8) in order to arrange the lower die (2) accurately, and preferably they are not close to each other.

[0011] In order to perform the referencing used in the press-die positioning system (1) precisely, after the conical pin (9) is fitted into the referencing hole (8), vertical guiding lines (11) are drawn with a stencil on the front and side surface of the lower die (2) for use in the subsequent arrangements. In the next arrangement of the lower die (2) on the bolster (7), these lines are used as the guiding lines (11). When the lower die (2) is being approached onto the bolster (7) by a crane (4), the laser (10) located on the bolster (7) produces a linear light at the light region (12) on the side surfaces of the lower die (2). This linear light emitted by the laser (10) is aligned with the guiding lines (11) on top of one another, and when the lower die (2) descends from this position vertically, the conical pins (9) can precisely fit into the referencing holes (8). By means of referencing this beam emitted by the laser (10) with the guiding lines (11), the lower die (2) will easily be placed on the bolster (7) without a need for alignment each time.

Claims

1. A press-die positioning system (1), which facilitates aligning the referencing holes on the die and the conical pins on the press bolster on top of one another, basically **characterized by**

   - at least one lower die (2) which is used to shape the sheet metal,
   - at least one upper die (3) which is placed on the lower die (2) and shapes the sheet metal placed between the lower die (2) and itself as a result of the pressure it applies,
   - at least one crane (4) which enables the lower die (2) and the upper die (3) to be carried as preferred,
   - at least one lifting lug (5) which is provided on the lower die (2) to enable the lower die (2) and the upper die (3) to be lifted by a crane (4),
   - at least one rope (6) which enables connection of the lower die (2) and the upper die (3) with the crane (4),
   - at least one bolster (7) on which the lower die (2) and the upper die (3) are arranged,
   - at least one referencing hole (8) which is located on the bottom part of the lower die (2) and drilled into the lower die (2),
   - at least one conical pin (9) which is formed on the bolster (7) and fits into the referencing hole (8), and which thus enables the lower die (2) to be placed on the bolster (7) in an aligned manner,
   - at least one laser (10) which is mounted on the bolster (7) and which produces a beam towards the lower die (2),
   - at least one guiding line (11) which is drawn on the side surface of the lower die (2),
   - at least one light region (12) which encompasses the region where the guiding line (11) is located on the lower die (2).

2. Press-die positioning system (1) according to Claim 1, **characterized by** the referencing holes (8) which are located on the bottom part of the lower die (2).

3. Press-die positioning system (1) according to any one of the preceding claims, **characterized by** the conical pin (9) which is located on the bolster (7) and fitted into the referencing hole (8).

4. Press-die positioning system (1) according to any one of the preceding claims, **characterized by** the

crane (4) which, in order for the lower die (2) and the upper die (3) to enter the production line, enables to lift the lower die (2) from the lifting lugs (5) on the sides thereof and arrange on the bolster (7).

5. Press-die positioning system (1) according to any one of the preceding claims, **characterized by** the referencing holes (8) which are located on the bottom part of the lower die (2) and are aligned with the conical pins (9) on the bolster (7) on top of one another to enable accurate placement.

6. Press-die positioning system (1) according to any one of the preceding claims, **characterized by** the conical pins (9) of which there are at least two in order to arrange the lower die (2) accurately on the bolster (7).

7. Press-die positioning system (1) according to any one of the preceding claims, **characterized by** the guiding lines (11) which, after the conical pin (9) is fitted into the referencing hole (8), are drawn with a stencil on the front and side surface of the lower die (2) for use in the subsequent arrangements.

8. Press-die positioning system (1) according to any one of the preceding claims, **characterized by** the laser (10) which is located on the bolster (7) and which, when the lower die (2) is being approached onto the bolster (7) by a crane (4), produces a linear light at the light region (12) on the side surfaces of the lower die (2).

9. Press-die positioning system (1) according to any one of the preceding claims, **characterized by** the guiding line (11), which is aligned with the linear light emitted by the laser (10) on top of one another, and which, when the lower die (2) descends from this position vertically, enables the conical pins (9) to precisely fit into the referencing holes (8).

10. Press-die positioning system (1) according to any one of the preceding claims, **characterized by** the guiding line (11), by which the said beam emitted from the laser (10) is referenced, and which thus enables the lower die (2) to be easily placed on the bolster (7) without a need for alignment each time.

FIG. 1

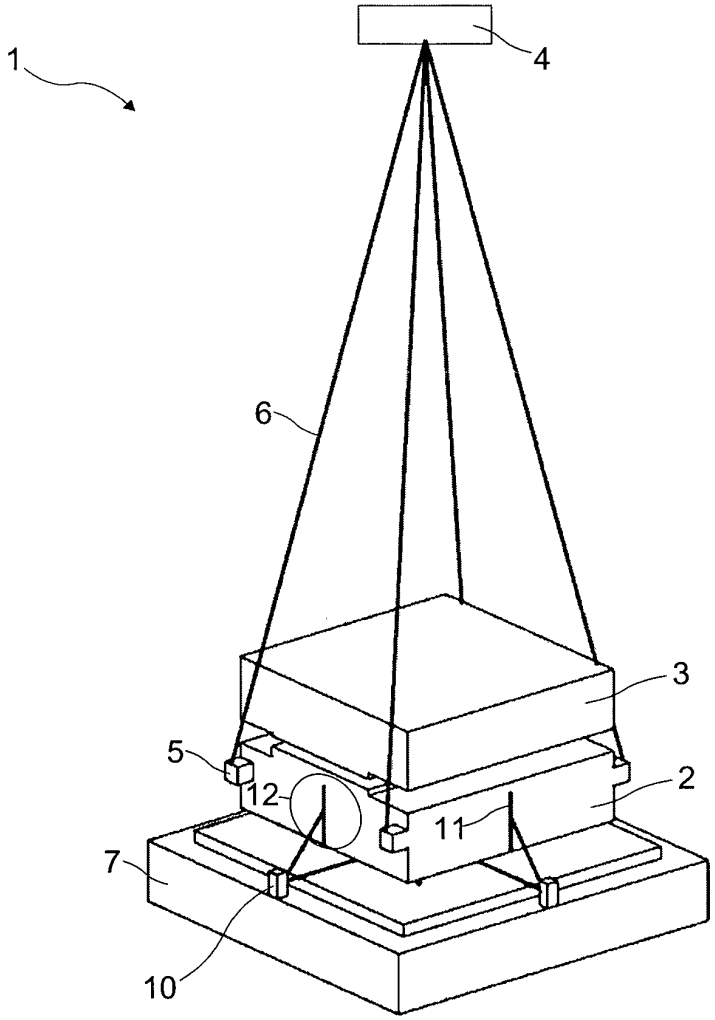


FIG. 2

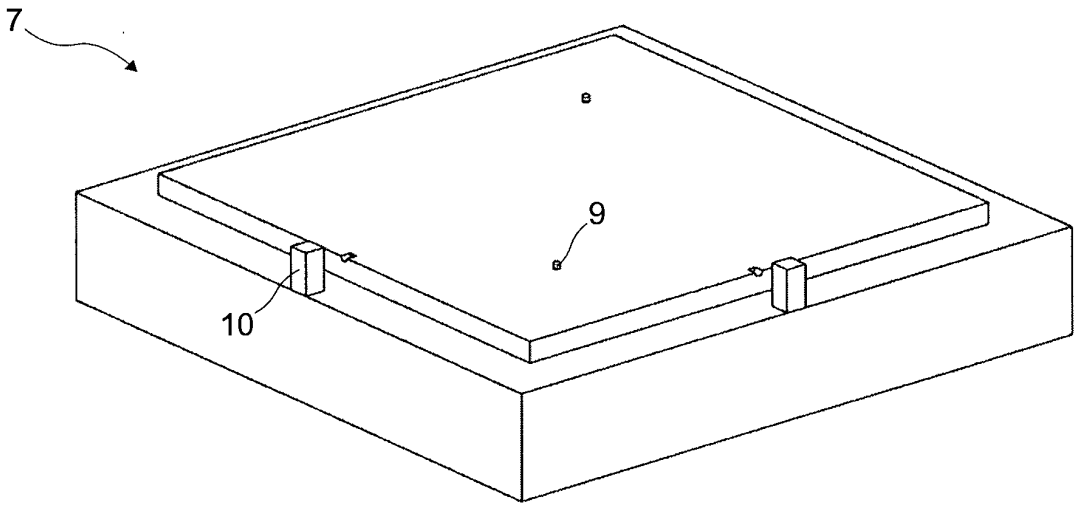


FIG. 3

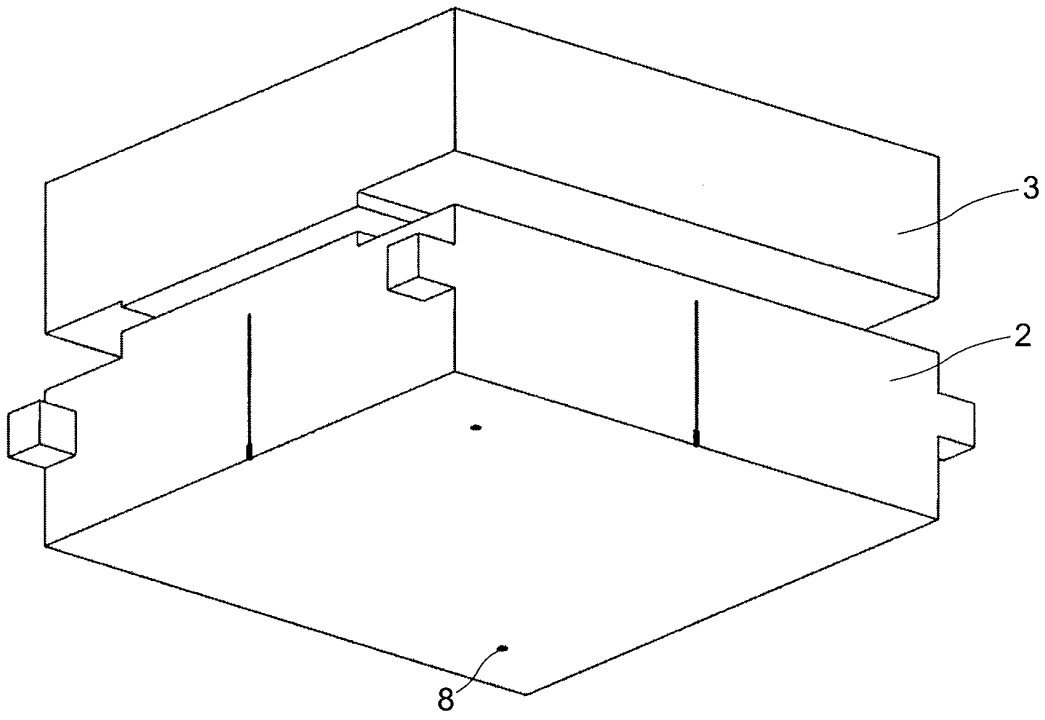
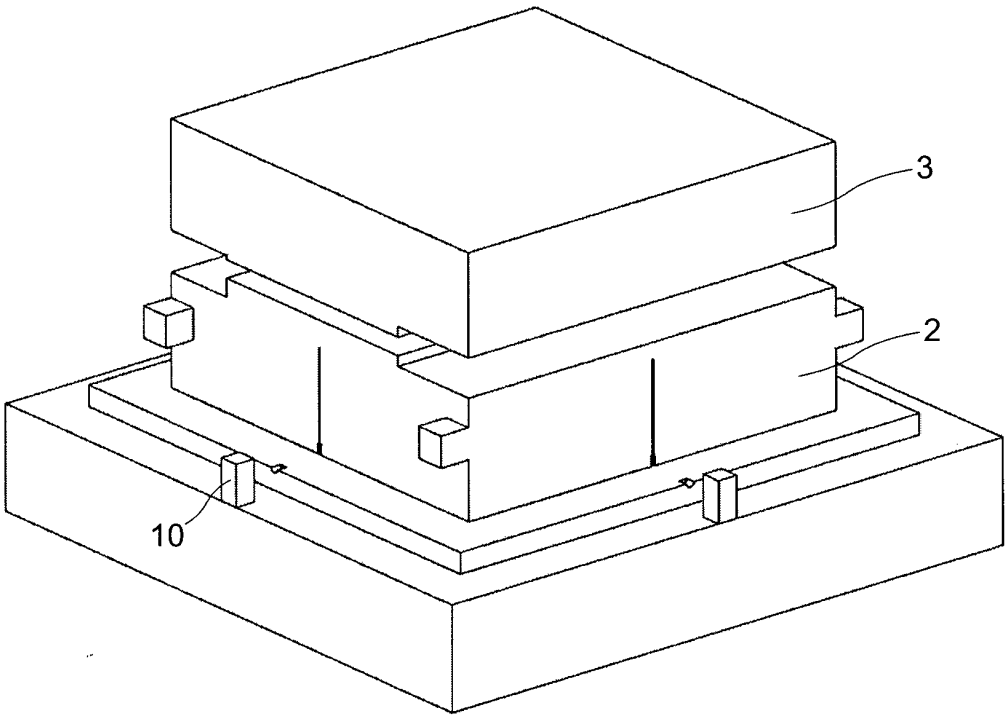


FIG. 4



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EUROPEAN SEARCH REPORT

Application Number
EP 14 17 1195

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	US 3 696 489 A (VECCHI JOHN C) 10 October 1972 (1972-10-10) * the whole document *	1-10	INV. B21D37/14 B30B15/02 B23Q16/12
A	WO 92/20473 A1 (HERMANSSON SONNIE [SE]) 26 November 1992 (1992-11-26) * the whole document *	1-10	B23Q3/18
A	JP 2002 059228 A (MITSUI HIGH TEC) 26 February 2002 (2002-02-26) * abstract *	1-10	
A,D	JP H08 39153 A (AMADA CO LTD) 13 February 1996 (1996-02-13) * abstract *	1-10	
			TECHNICAL FIELDS SEARCHED (IPC) B21D B30B B23Q

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	10 November 2014	Vinci, Vincenzo

CATEGORY OF CITED DOCUMENTS

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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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10-11-2014

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82