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(54) **Multiple punching head with manual punch selection**

(57) Manual multiple punching head which allows selection of a punch (2) from among the several punches (2,2',2'') that form the head in an accurate and safe manner. The head is connected to a vertical actuation power element (8) which moves it vertically downwards together

with one of the several punches (2,2',2''). The head has a punch selector (3) that comprises a magnet (6) to ensure selection of the punch in combination with a magnetic sensor (7). When the magnetic sensor (7) of the selected punch and the magnet (6) are facing each other, the selected punch (2) is in the correct position.

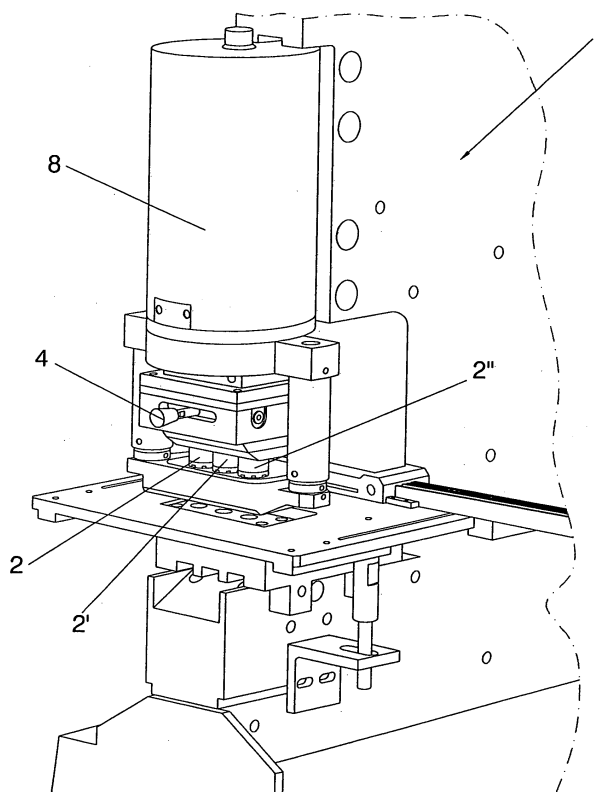


FIG. 1

Description

OBJECT OF THE INVENTION

[0001] The present invention, as expressed in the title of this specification, relates to a manual multiple punching head, the structure of which allows the selection operation of the punch to be used, from among the different punches included in the head, to be carried out in an accurate and safe manner, ruling out any possibility of error.

BACKGROUND OF THE INVENTION

[0002] At present, most multiple punching heads are automated, i.e. a numerical control is used to control the selection of the punch to be used.

[0003] Now then, if what we want is a multi-head punching machine that will not be used for the mass serial production of workpieces, it should preferably be inexpensive.

[0004] To this end, there are low-cost punching machines with manual multiple punching heads.

[0005] The problem with said machines is that, upon selecting the punch so that it is the only punch that moves by means of the oleohydraulic/pneumatic cylinder or any other actuation system, there is no system that will accurately carry out said selection operation, due to which if the selector is used incorrectly both the desired and adjacent punch will be actuated.

DESCRIPTION OF THE INVENTION

[0006] In order to achieve the aims and avoid the aforementioned drawbacks, the invention proposes a manual multiple punching head, the shape and design of which allows the selection operation of the punch to be used, from among the several punches that form the head, to be carried out in an accurate and safe manner. The punching head is formed by several punches having a sole degree of freedom of movement along the "Z" axis, i.e. they can only move in a vertical direction.

[0007] The head has a selector which can be actuated by means of an internal handle, in such a manner that said selector can be moved along a transverse guide element.

[0008] The function of the selector is to block the vertical movement of the selected punch, in such a manner that, upon selection thereof, the hydraulic/pneumatic actuation of the punching machine will push the head, punching only the selected punch and moving the other two punches vertically in a relative upward direction without punching with respect to the selected punch.

[0009] In order to determine the adequate position of the selector, it has a low-power magnet on the part opposite the frontally disposed handle, complemented by magnetic sensors placed in opposition to the respective punches at the back of the punching head, one per punch,

in such a manner that the selector will only be correctly positioned if it is facing the selector magnet and magnetic sensor of the punch to be used.

[0010] Finally, it must be pointed out that, if the selector magnet and magnetic sensor are not facing each other and the punching machine receives the punching order, the head would not move, as it would not receive the correct position signal from the selector.

[0011] In order to better understand this specification, it is accompanied by a set of figures forming an integral part thereof, where the object of the invention has been represented in an illustrative and non-limiting manner.

BRIEF DESCRIPTION OF THE DRAWINGS

[0012]

Figure 1 shows a perspective view of a punching machine that includes the manual multiple punching head object of the invention.

Figure 2 shows a perspective view of the head of the invention.

Figure 3 shows a perspective view that essentially shows a selector connected with a magnet and magnetic sensors that form part of the head of the invention.

DESCRIPTION OF THE PREFERRED EMBODIMENT

[0013] Considering the numbering system used in the figures, the manual multiple punching head forms part of a punching machine 1, preferably having three punches 2-2'-2" movable in a vertical direction. It also includes a selector 3, movable by means of a frontally disposed handle 4 along a transverse guide element 5, perpendicular to the vertical direction of punches 2-2'-2".

[0014] The desired punch 2 is selected by means of the selector 3, in such a way that the selector 3 will be arranged in opposition to the selected punch 2, in such a manner that, once selected, actuation of the machine 1 is activated by means of an oleohydraulic/pneumatic cylinder 8, moving it only towards the selected punch 2 with insertion of the selector 3, whereupon the head assembly and selected punch 2 move vertically downwards, while the other two punches 2'-2" will remain static or move in a relative upward direction with respect to the selected punch 2.

[0015] In order to ensure the adequate position of the selector 3, it includes, at the rear part thereof opposite the location of the frontally arranged handle 4, a low-power magnet 6 in combination with three magnetic sensors 7 arranged in opposition to the respective punches 2-2'-2" and located at the back of the head, in such a manner that the selector 3 will only be correctly positioned when facing the magnet 6 of the selector 3 and the magnetic sensor 7 of the selected punch 2 to be used.

[0016] As stated in the previous sections, if the magnet 6 of the selector 3 and the magnetic sensor 7 are not

facing each other and the punching machine 1 receives the punching order, the head will not move, as it would not receive the correct position signal from the selector 3 through its built-in magnet 6.

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Claims

1. MANUAL MULTIPLE PUNCHING HEAD, wherein said head is connected to a vertical actuation power element that moves the head vertically downwards together with one of the several punches (2-2'-2'') by means of a selector arranged in opposition to the selected punch (2), **characterized in that** it includes means that ensure the selection of the selected punch (2) by means of a magnet (6) connected to the selector (3) in combination with magnetic sensors (7), each of which are arranged in opposition to the punches (2-2'-2'') and in parallel alignment with the movement of the selector (3), whereupon the correct position of the selected punch (2) is found when the magnet (6) is facing the magnetic sensor (7) corresponding to said selected punch (2).

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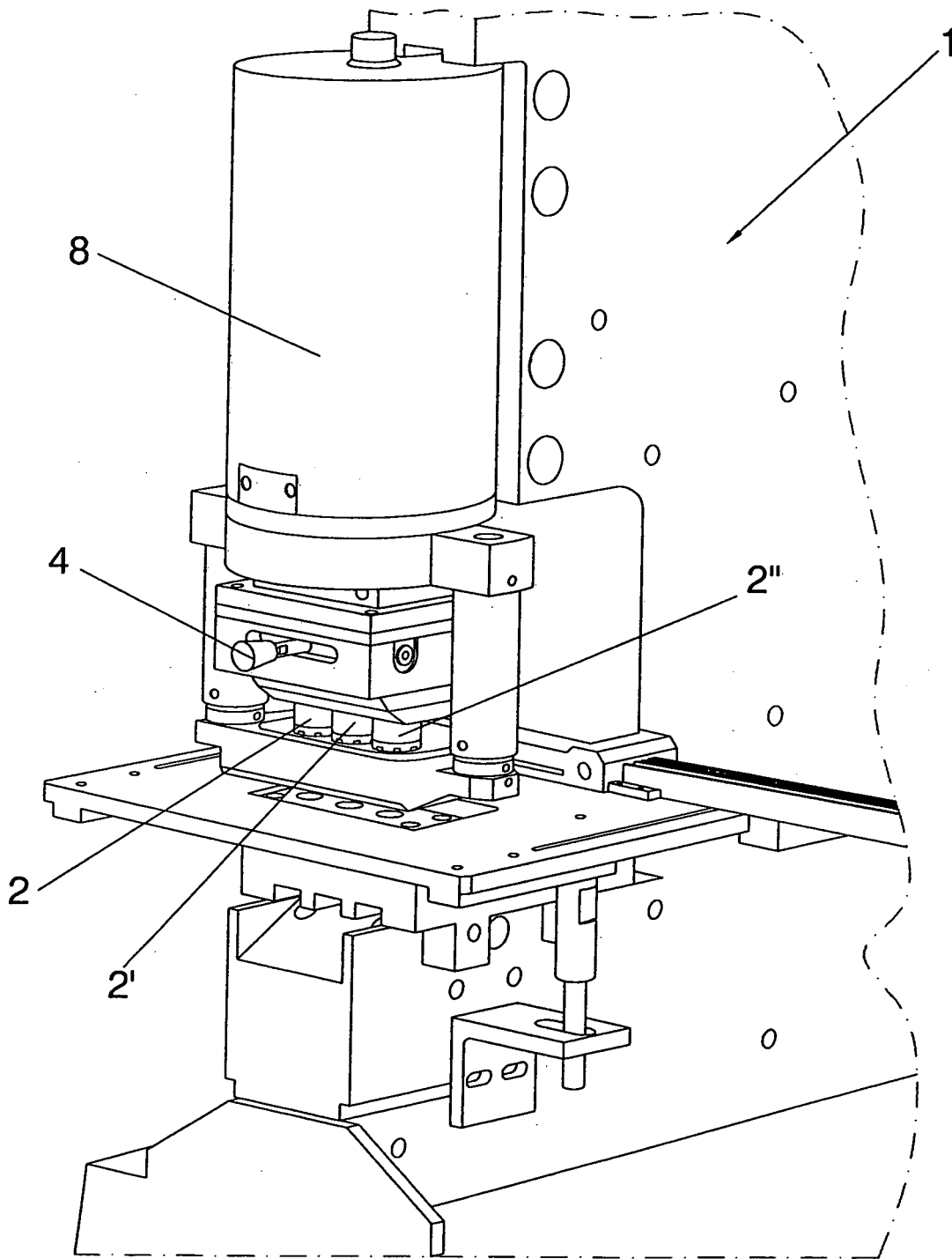


FIG. 1

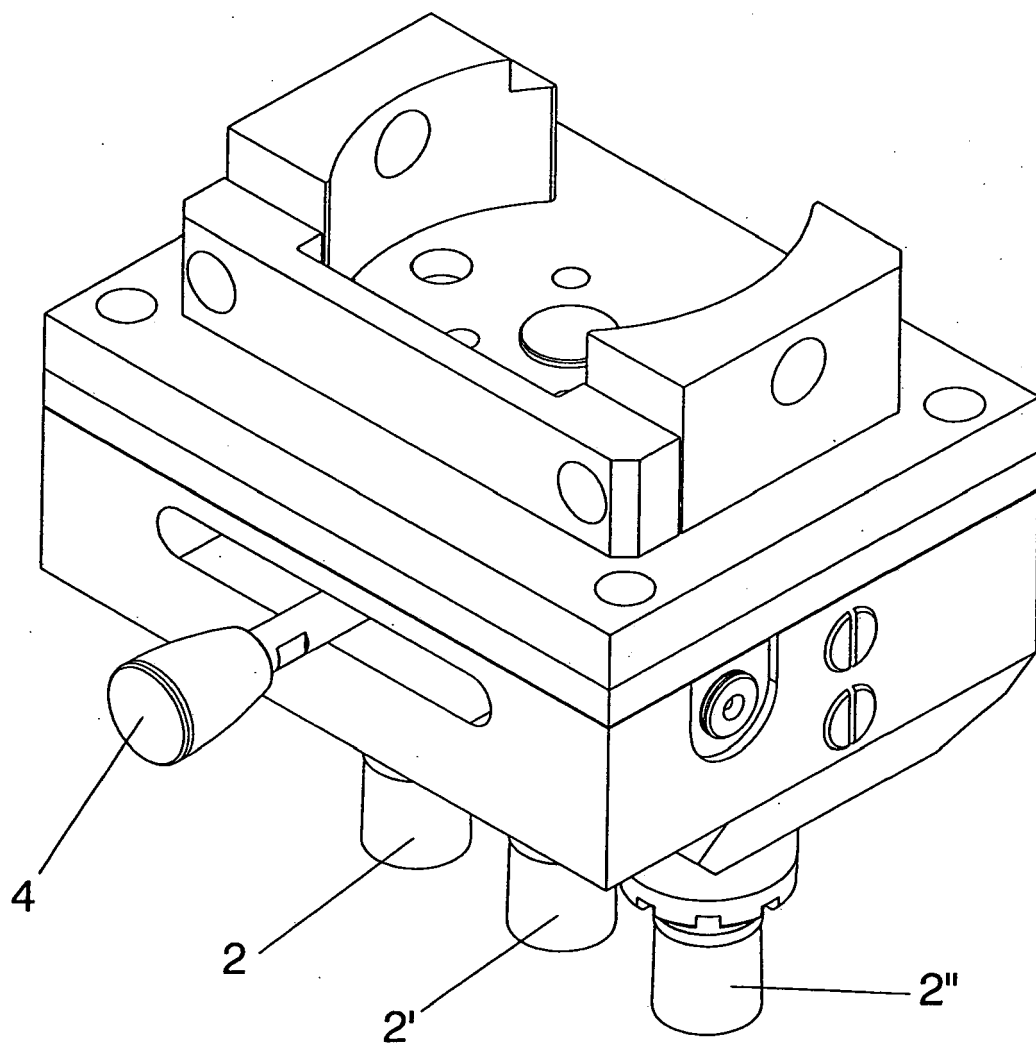


FIG. 2

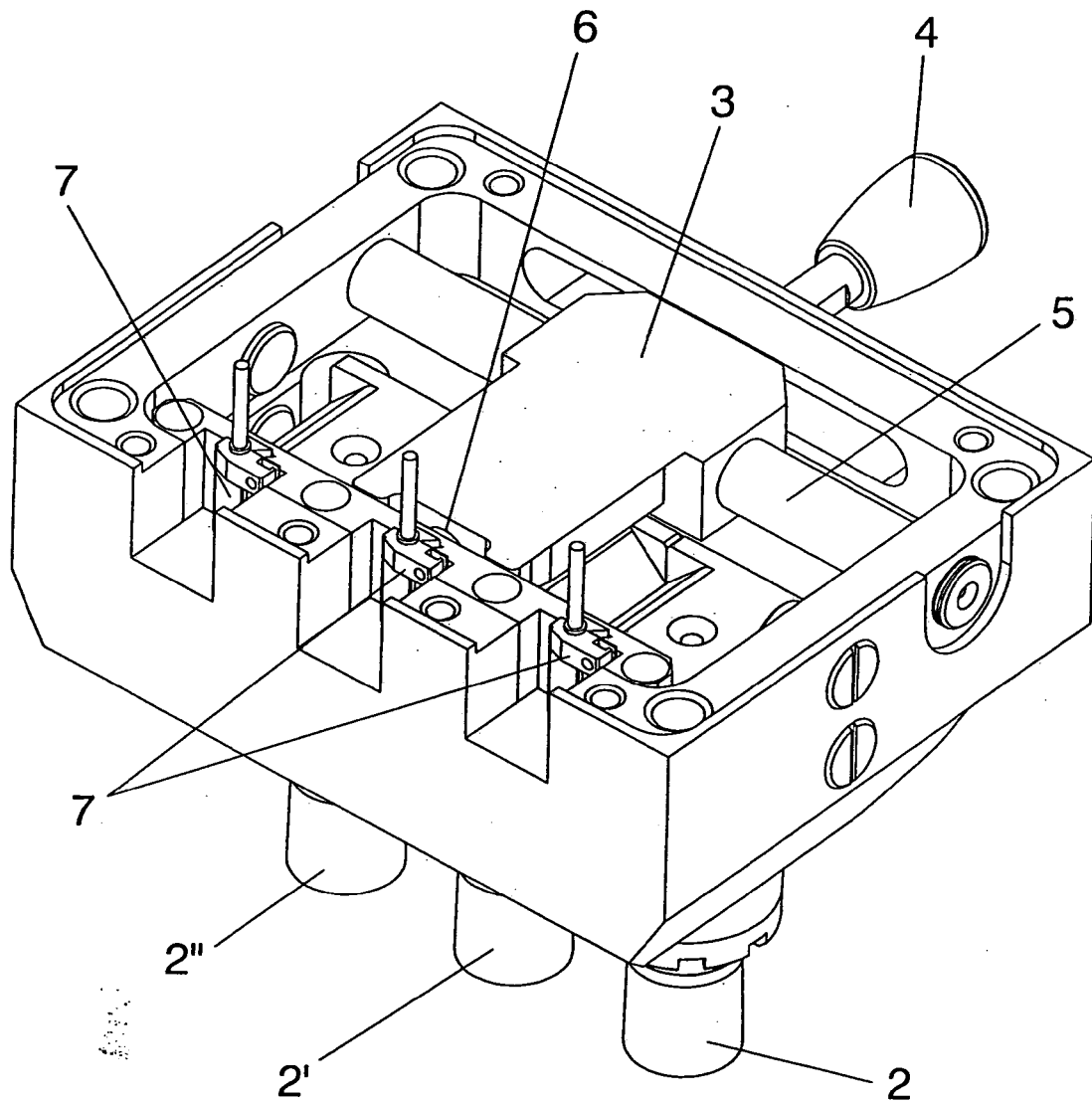


FIG. 3



EUROPEAN SEARCH REPORT

Application Number
EP 11 38 0003

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 4 480 782 A (MORISHIMA SATOMI [JP]) 6 November 1984 (1984-11-06) * column 4, line 15 - line 66; figures * -----	1	INV. B21D28/00 B21D28/24
A	US 2 138 543 A (GRAPPE MARCELLIN L) 29 November 1938 (1938-11-29) * page 2, left-hand column, line 50 - line 60; figures * -----	1	
A	DE 15 02 721 A1 (GILBOS CONST PVBA) 8 January 1970 (1970-01-08) * the whole document * -----	1	
			TECHNICAL FIELDS SEARCHED (IPC)
			B21D
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 4 May 2011	Examiner Pieracci, Andrea
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			

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**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 11 38 0003

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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04-05-2011

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EPO FORM P0459

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