



Europäisches Patentamt
 European Patent Office
 Office européen des brevets



Publication number: **0 519 373 A1**

EUROPEAN PATENT APPLICATION

Application number: **92110054.1**

Int. Cl.⁵: **B28B 13/02**

Date of filing: **15.06.92**

Priority: **20.06.91 IT BO910218**

I-40026 Imola (Bologna)(IT)

Date of publication of application:
23.12.92 Bulletin 92/52

Inventor: **Alieri, Rodiero**
Via Liverani 7
I-40026 Imola (Bologna)(IT)

Designated Contracting States:
DE ES

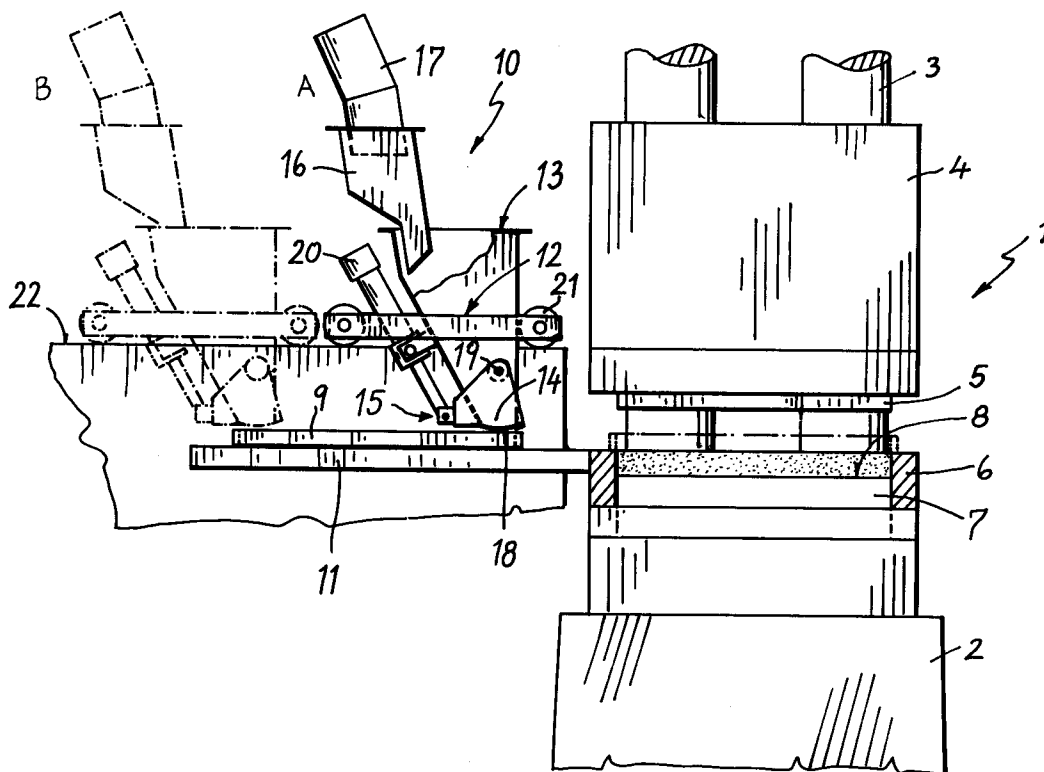
Representative: **Modiano, Guido et al**
c/o Modiano & Associati S.r.l. Via Meravigli,
16
I-20123 Milano(IT)

Applicant: **SACMI Cooperativa Meccanici**
Imola Soc. Coop. a Resp. Lim.
Via Provinciale Selice 17/A

Device for loading powder in molds of ceramic presses.

The device for loading powder into the molds of ceramic presses has a powder transfer slider (9) which is moveable along a horizontal plane (11) between a position for receiving the powder from a

hopper (13) and a position of superimposition above the mold (6,7) in order to fill the forming chamber (8). The hopper (13) is moveable above the slider (9) when the slider (9) is in the receiving position.



EP 0 519 373 A1

The present invention relates to a device for loading powder in molds of ceramic presses.

As is known, in ceramic presses there are devices for transferring the powder into the molds; said devices consist of a slider which is actuated with reciprocating motion between a position for receiving the powder from a hopper, which is external to the press, and a position which lies above the mold for filling the forming chamber.

With these devices, there is the problem that powder is fed into the slider even when said slider moves over the mold at the end of the pressing step. This simultaneous condition entails the overlap of different adjustment requirements which leads to irregularities in the distribution of the powder in the slider and consequently in the forming chamber, causing non-uniformity problems of the pressed product.

Furthermore, with known devices it is not possible to strictly control the deposition of the powder in the slider and consequently its density in the forming chamber.

The technical aim of the present invention is therefore to provide a device which allows to load the molds of ceramic presses without the above described problems.

This aim is achieved with a device which comprises a powder transfer slider moveable along a horizontal plane between a position for receiving powder from a hopper and a position of superimposition on the mold in order to fill the forming chamber, characterized in that said hopper is moveable above said slider when said slider is in said receiving position and is provided with a variable-aperture discharge outlet for distributing the powder in said slider during the movements of the hopper.

Further peculiarities will become apparent from the following description of an embodiment illustrated only by way of non-limitative example in the accompanying drawing, wherein:

the figure is a schematic lateral elevation view of the device according to the invention.

With reference to the above figure, the reference numeral 1 designates a generic press for manufacturing ceramic tiles. The press comprises, in a manner which is known and therefore not described in detail, a base 2 from which vertical guiding posts 3 for an upper cross-member 4 rise; said cross-member 4 supports the pressing punches 5.

The forming mold is arranged on the base 2 and is composed of an annular matrix die 6 which surrounds the counterpunches 7. Said counterpunches 7 are moveable between a raised level, at which they are co-planar with the upper face of the matrix die, and a lowered level, in which they define, together with the matrix die, the chambers 8

into which the powder to be pressed must be introduced.

The powder is transferred into the chambers 8 by a slider 9 which is associated with the loading device, generally designated by the reference numeral 10, and is slideable on a surface 11 which is coplanar with the matrix die 6.

The loading device comprises a carriage 12 which supports a hopper 13 having a lower discharge outlet 14 controlled by a valve 15.

A secondary hopper 16 leads, in an upward position, into the hopper 13, is rigidly associated with said hopper and is capable of keeping a constant level of powder inside said hopper 13.

The secondary hopper 16 is, in any case, not indispensable for the correct functionality of the device.

The valve 15 comprises a shutter 18 which is articulated to the hopper about an axis 19 and is actuated by means of an actuator 20 which is constituted by a cylinder whose jacket is articulated to the hopper 13 and whose stem is articulately coupled to the shutter 18. The carriage 12 which supports the hopper slides on rails 22 by means of wheels 21 and is actuated between the two positions shown in the figure in solid lines and in broken lines by means of an actuator, not shown, with the possibility of assuming variable speeds between said two positions.

A possible operation of the described device is as follows.

Assume that the slider 9 has just completed the filling of the chamber 8 and has moved so that it is above the surface 11, while the hopper 13 is in position A.

At this stage, while the cross-member 4 descends in order to press the powder contained in the chamber 8, the outlet 14 of the hopper is opened and the device 10 is transferred from the solid-line position A to the broken-line position B. Positions A and B can be adjusted with respect to the carriage. An accurate distribution of the powder in the slider 9 is thus produced.

When the device has reached its stroke limit, the shutter 18 is actuated again in the position for closing the outlet 14, so that when the cross-member 4 of the press has risen, the slider 9 can be transferred above the matrix die in order to deposit the subsequent dose of powder in the chamber 8. Meanwhile, the device 10 has returned to its initial position, close to the press, ready to resume the cycle in the above described manner. It is also possible to provide that the loading of the slider 9, when it is over the surface 11, occurs once during the forward stroke of the device 10 and once during its return stroke.

According to a preferred embodiment of the invention, the carriage 12 is moved at a variable

speed in order to ensure a different distribution of the powder in the slider.

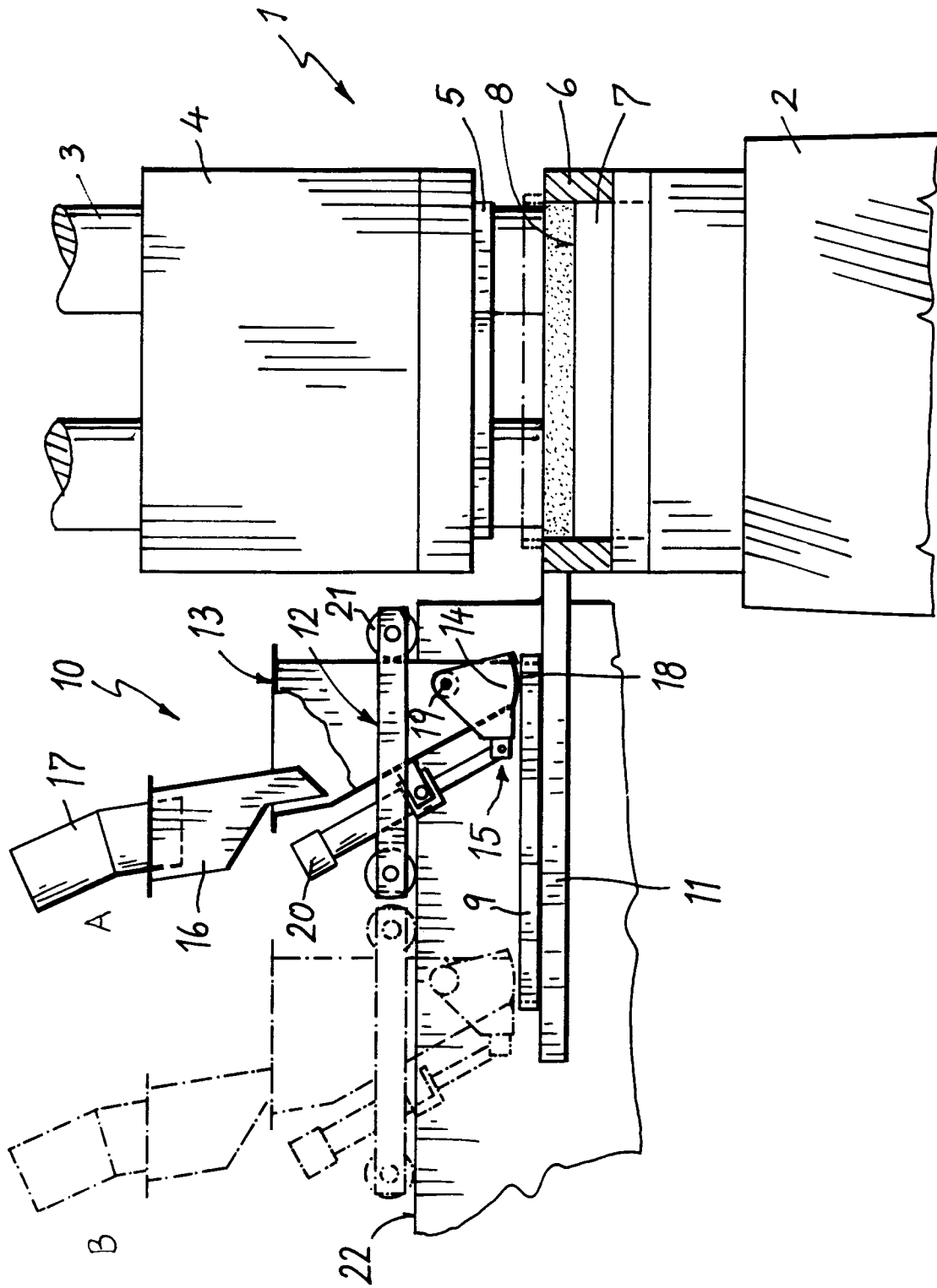
Equally, it is possible to vary the distribution of the powder by providing appropriate undulations in the profile of the rails 22, so as to raise and lower the discharge outlet 14 with respect to the slider. A differentiation is thus obtained in the thickness of the powder contained in the slider, as is often requested when one wishes to intervene on localized regions of the finished product in order to obtain certain effects.

As can be seen, the above described invention allows to obtain substantial advantages by virtue of the fact that the slider is loaded during the pressing step and thus in a period of time which is long enough to ensure perfect control of the distribution of the powder which is contained in the slider 9 and is then discharged into the forming chamber 8.

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 scope of each element identified by way of example by such reference signs.

Claims

1. Device for loading powder in molds of ceramic presses, comprising a powder transfer slider (9) moveable along a horizontal plane (11) between a position for receiving powder from a hopper (13) and a position of superimposition on the mold (6,7) in order to fill the forming chamber (8), characterized in that said hopper (13) is moveable above said slider (9) when said slider (9) is in said receiving position.
2. Device according to claim 1, characterized in that said hopper (13) is moveable above said slider (9) when said slider (9) is in said receiving position and is provided with a discharge outlet (14) which is controlled by a valve (15) so as to distribute the powder in said slider (9) during the movements of the hopper (13).
3. Device according to claim 1 or 2, characterized in that said hopper (13) is mounted on a carriage (12) slideable on rails (22).
4. Device according to one of claims 1 to 3, characterized in that a secondary hopper (16) leads into said hopper (13) for keeping a constant level of powder inside said hopper (13).
5. Device according to any one of claims 2 to 4, characterized in that said carriage (12) is actuated with variable motion between the two adjustable stroke limits according to the required distribution of powder in the transfer slider (9).
6. Device according to any one of claims 2 to 5, characterized in that said rails (22) have an undulated profile in order to raise and lower the discharge outlet (14) of the hopper (13) with respect to the slider (9) according to the thickness of powder to be discharged into said slider (9).





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.5)
X	FR-A-2 636 658 (ETABLISSEMENTS DEMLER S.A.) * the whole document *	1-4	B28813/02
Y	---	5, 6	
X	FR-A-2 017 697 (DOLOMITWERKE G.M.B.H.) * page 4, line 28 - page 5, line 8; figure 5 *	1, 3	
Y	---		
Y	DE-A-3 332 969 (LAEIS-WERKE AG) * the whole document *	5	
A	---	1-4	
Y	US-A-3 041 701 (M. E. GATES) * the whole document *	6	
A	---	1	
Y	US-A-2 957 222 (L. ZMANIA) * the whole document *	6	
A	---	1	
Y	GB-A-588 856 (C. WHITTAKER & COMPANY LIMITED) * the whole document *	6	TECHNICAL FIELDS SEARCHED (Int. Cl.5)
A	---	1	
A	DE-C-532 497 (TH. GROKE AKT.-GES.) * the whole document *	1, 2	B288 B30B

The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 19 AUGUST 1992	Examiner GOURIER P. A.
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			