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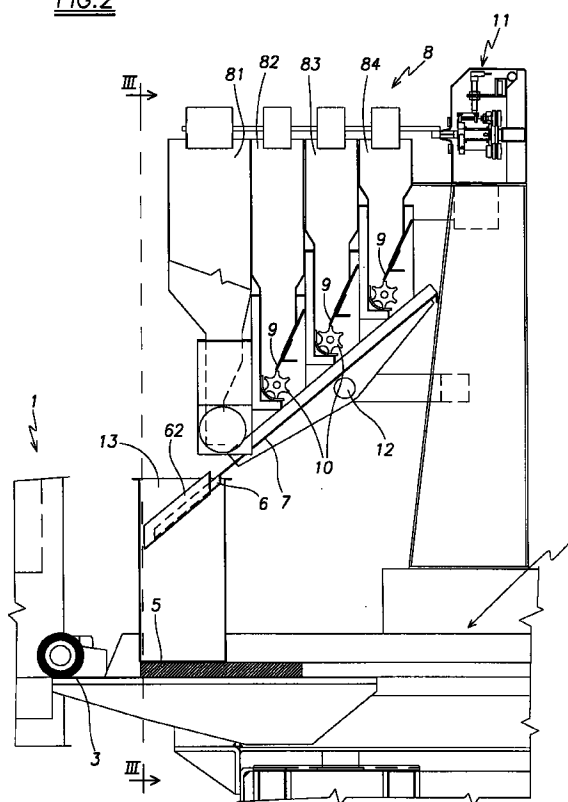
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(54) **Clay loading device for ceramic tile presses**

(57) A clay loading device for ceramic presses intended for tile formation, comprising a loading carriage (4) provided with a number of grids (5) equal to the number of mould cavities (2); a loading discharge receiver (13) overlying said carriage (4); an inclined plate (7), the front edge of which (6) is in the form of a number of segments (6) inclined to the plate (7) longitudinal axis equal to the number of carriage grids (5); and at least two hoppers (81,82,83,84) positioned overlying said plate (7) one following the other in the direction of the plate slope, each of which is provided with powder dispensing means (10) extending along the entire width of the plate (7).

FIG.2



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Description

This invention relates to the means for loading presses for forming ceramic flooring and facing tiles.

Modern tile manufacturing methods are aimed at tile formation by dry-pressing powders already mixed with colourings and possibly with other aids.

These methods produce tiles which are coloured throughout their entire bulk or at least a layer of it, and are commonly known as porcellainized ceramic stone tiles.

The decorative effects on the exposed surface of said tiles are due to the distribution of the colouring within the pressed powder mass.

One type of tile decoration obtainable by said technique consists of a random distribution of multi-colour veining within the bulk of the tile, giving its exposed surface the appearance of marble, in particular of marble with variously coloured elongate veining.

In obtaining the desired veins in terms of shape, length and colour combination, the manner in which the variously coloured powders, contained in separate hoppers, are fed into the mould cavities is of particular importance.

In this respect, said powders must in total have and maintain an at least partly stratified arrangement, and be distributed throughout the thickness so that different coloured quantities appear at the surface as elongated veins, partly mixed with the adjacent masses.

An object of the present invention is to provide means for loading these powders into the mould cavities which, within the framework of a simple and reliable construction, enable the desired powder distribution to be obtained.

A further but no less important object of the invention is to enable said powder loading means to receive emerging quantities of different coloured powders separated by a line as highly defined as possible, so as to obtain on the exposed tile surface adjacent surface-visible veins in which the touching colours are in sharp contrast, ie with very little shading.

These objects are attained by the invention as defined by the claims.

The merits and operational and constructional characteristics of the invention will be more apparent from the following detailed description given with reference to the figures of the accompanying drawings, which illustrate a particular preferred embodiment thereof by way of non-limiting example.

Figure 1 is a schematic side view of the invention.

Figure 2 is an enlarged part of Figure 1.

Figure 3 is a section on the line III-III of Figure 2, to a reduced scale.

Figure 4 is a section on the line IV-IV to an enlarged scale.

Figure 5 is a plan view of the grid.

The figures show a usual ceramic press 1, the plate of which carries a mould 2 with three impressions or

cavities, which is of usual type and will therefore not be described in detail.

The means for loading powders into the mould are positioned as usual on the rear side of the press.

Said means comprise a table 3 on which a usual loading carriage 4 driven with reciprocating movement slides, and which is coplanar with the upper surface of the impressions in the mould 2, themselves coplanar with the press plate.

For each mould cavity or impression, the carriage 4 comprises at least one grid 5 which moves from a region in which it overlies the impressions, to a rear region in which it receives the powder to be pressed.

The grid is closed lowerly by the actual table on which the carriage slides, except in the region in which it overlies said mould cavity.

When in its retracted position the carriage is partly covered by the lower mouth of a single transverse discharge receiver 13 which is rectangular in plan and has a dimension in the carriage travel direction which is less than the grid dimension in the same direction.

The receiver 13 has its lower mouth practically in contact with the upper surface of the carriage, and maintains it closed except when the grid 5 is below said mouth.

In the illustrated example the grid 5 is divided into three parts, the receiver 13 also being divided into three parts, each intended to overlie one of the parts of the grid (see Figures 3, 4).

Lying above the receiver 13 there is the lower end of an inclined plate 7, the front edge 6 of which is composed of three inclined segments 6 joined together by two segments parallel to the axis of the plate 7.

Each of the three inclined segments 6 occupies a width of the plate 7 at least equal to the width of one of the three parts into which the receiver 13 is divided.

In front of and at a short distance from the inclined segment 6 there is provided a vertical sheet metal wall 62 which compels the powder leaving the edge of the inclined plate 7 to fall vertically.

The inclined plate 7 has an inclination such as to enable the powder lying on it to slide freely downwards, this inclination being about 45° in the example.

Overlying the entire width of the inclined plate 7 there are a plurality of hoppers 8, namely four hoppers 81, 82, 83, 84 in the example, their lower mouth consisting of a slit of length equal to the width of the underlying plate, each hopper intended to contain a determined quantity of powder of desired particle size and colour.

The lower mouth of each hopper is throttled by a gate valve which regulates the powder flow rate, and is closed by a rotary star valve 10.

Both the hoppers 8 and the inclined plate are supported by a rear structure 11, the inclined plate being supported at its centre and fixed onto a shaft so that its inclination can be varied.

The structure 11 also supports the said discharge receiver 13.

The star valves 10 and the flow regulating gate valves 9 are controlled by a microprocessor programmed to allow the desired powder quantities and qualities to fall at each cycle.

The grid 5 is usually composed of a frame 51 defining an empty space occupied by seven separators 52.

The shape of said seven separators is substantially indifferent in attaining the results required of the invention.

However it has been noted that if a plurality of very long veins are required while maintaining the inclination of the constituent inclined segments 6 of the front edge of the inclined plate 7, the seven separators should preferably be rectilinear and have the same inclination to the longitudinal axis of the plate 7 as the edges 6.

The operation of the aforescribed device is as follows.

The gate valves 9 and the star valves 10 are operated synchronously with the movement of the carriage 4, so that at least two superposed layers of different quality powder form on the inclined plate 7.

Without mixing, said two layers slide towards the edges 6 from which they fall vertically, still substantially separated, into the discharge receiver 13.

In this latter a material height of between 100 and 300 mm is constantly maintained.

When they reach the base of the receiver, or reach the material contained in it, said at least two layers land to widen out and partially mix, to form in the receiver a quantity of strata in powder form partly mixed at their separation surfaces and orientated in an inclined direction.

When the carriage grids 5 pass under the lower mouth of the receiver, they collect with substantially the same distribution the material descending from the receiver.

As the to-and-fro movement of the carriage is very fast, the inertial forces generated on the powder mass tend to mix together its various constituent veins.

The extent and quality of said mixing also depends on the form of the grid.

If for example the grid is composed of a very fine mesh of square cells, the powder distribution would in the limit not change.

If the grid comprises baffles nearly parallel to the inclined edges 6 of the plate 7, vein distribution is accentuated in a direction inclined to the tile sides.

The final result is in any event a tile which, at least within the central diagonal strip of the exposed face, comprises veins in which different quality materials lie side by side with modest mixing, creating the required aesthetic effect within the tile.

Claims

1. A clay loading device for ceramic presses intended for tile formation, comprising a loading carriage driven with to and fro movement between a position

close to the mould cavities and a position close to a loading discharge receiver, said carriage comprising a number of grids equal to the number of mould cavities and travelling between a position underlying said receiver and a position overlying the mould cavities, characterised in that into said receiver there extends an inclined plate, the front edge of which is in the form of a number of segments inclined to the plate longitudinal axis equal to the number of carriage grids, overlying said plate there being provided at least two hoppers positioned one following the other in the direction of the plate slope, each of which is provided with powder dispensing means extending along the entire width of the plate.

2. A device as claimed in claim 1, characterised in that the discharge receiver is divided into a number of parts equal to the number of carriage grids and mould impressions, each part receiving one of the inclined segments of the front edge of the inclined plate.
3. A device as claimed in claim 2, characterised in that each of said inclined segments occupies the entire width of the corresponding part of the discharge receiver.
4. A device as claimed in claim 1, characterised in that in proximity to each of the inclined segments of the inclined plate there is positioned along its entire width a vertical sheet metal wall which compels the clay leaving the segment to fall vertically.
5. A device as claimed in claim 1, characterised in that the inclined plate is overlaid through its entire width by a plurality of hoppers the lower mouth of which consists of a slit the length of which equals the width of the underlying plate, each hopper being intended to contain a determined quality of powder of desired particle size and colour.
6. A device as claimed in claim 1, characterised in that the lower mouth of each hopper is throttled by a gate valve which regulates the powder flow rate, and is closed by a rotary star valve.

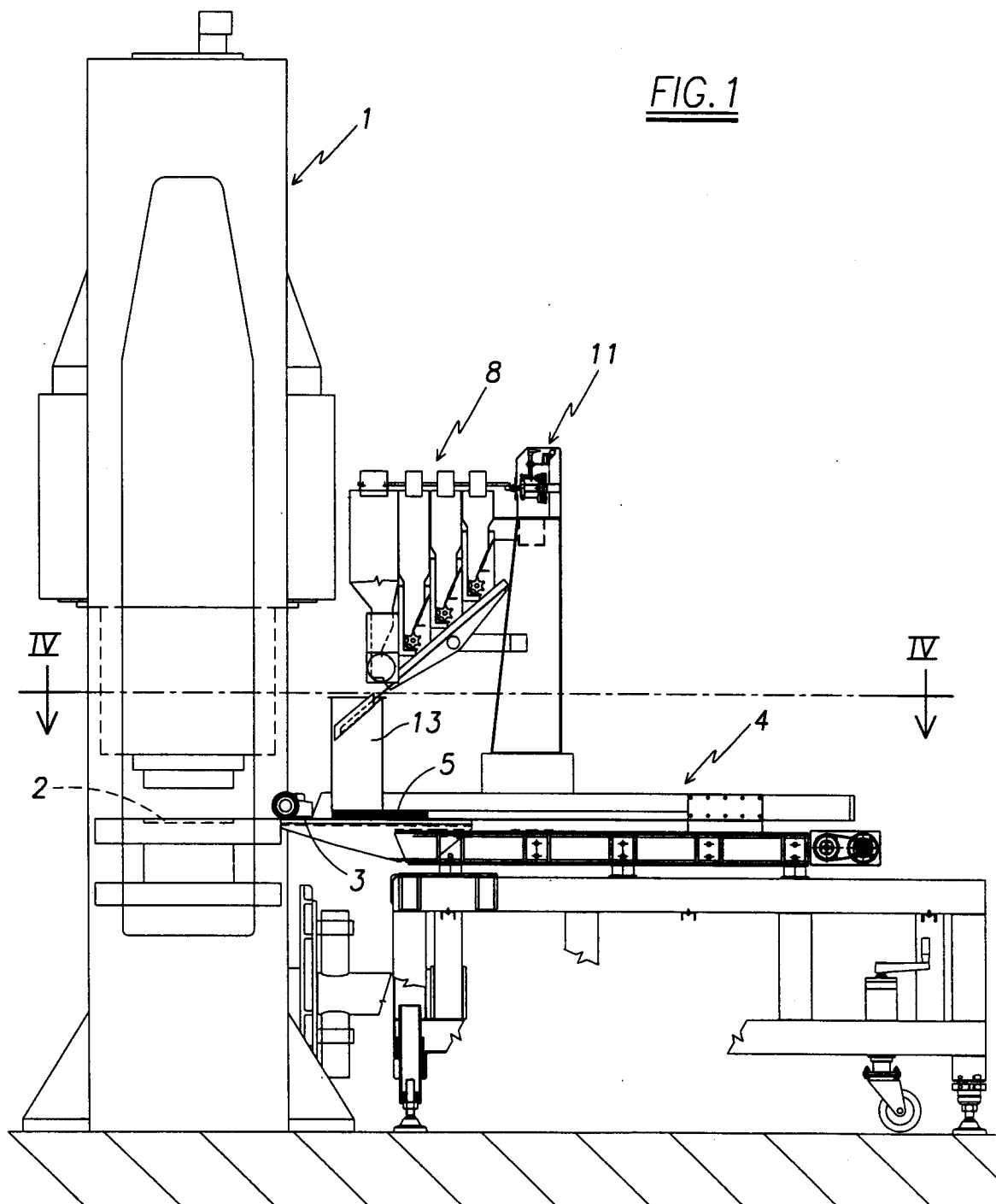


FIG. 2

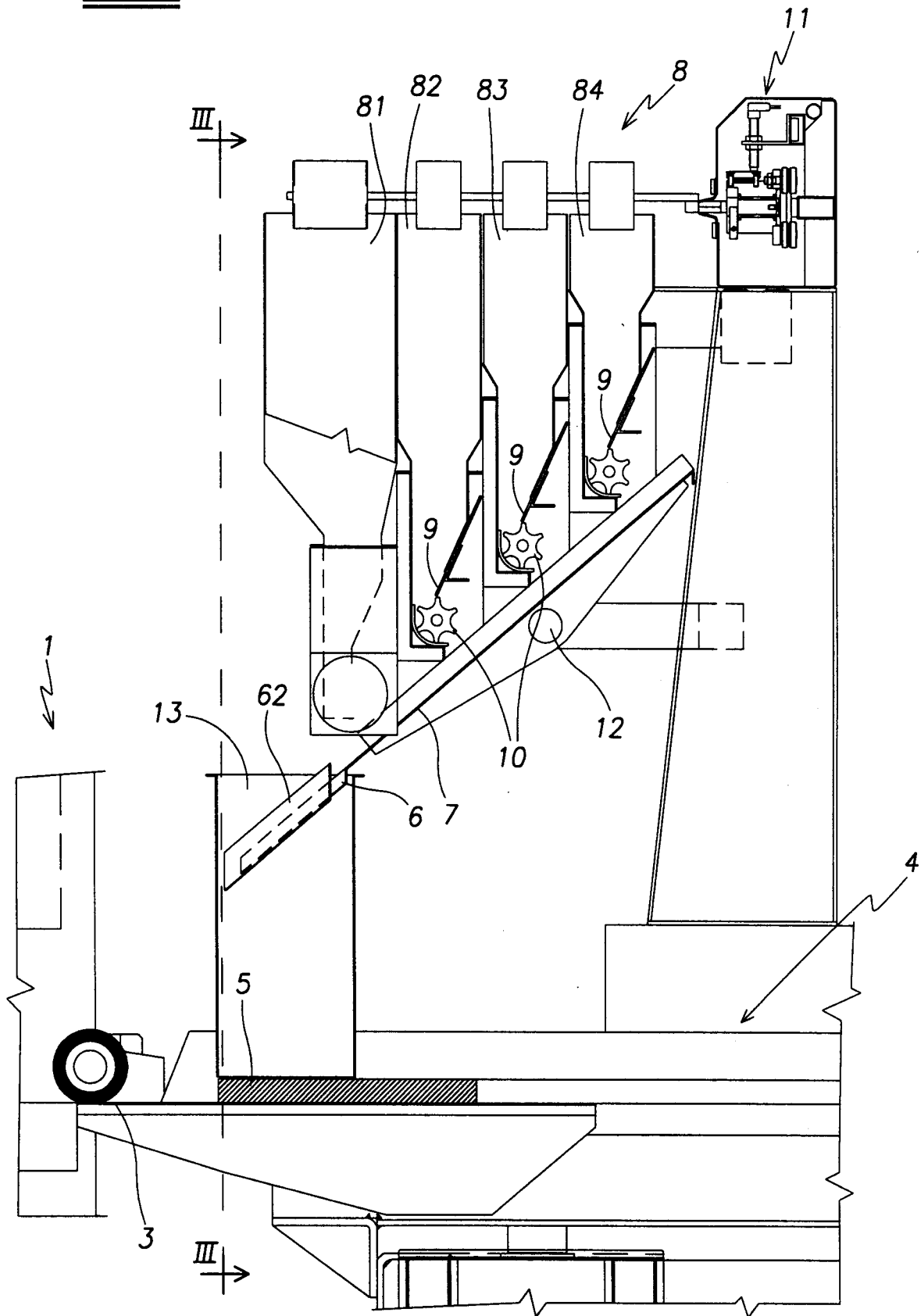
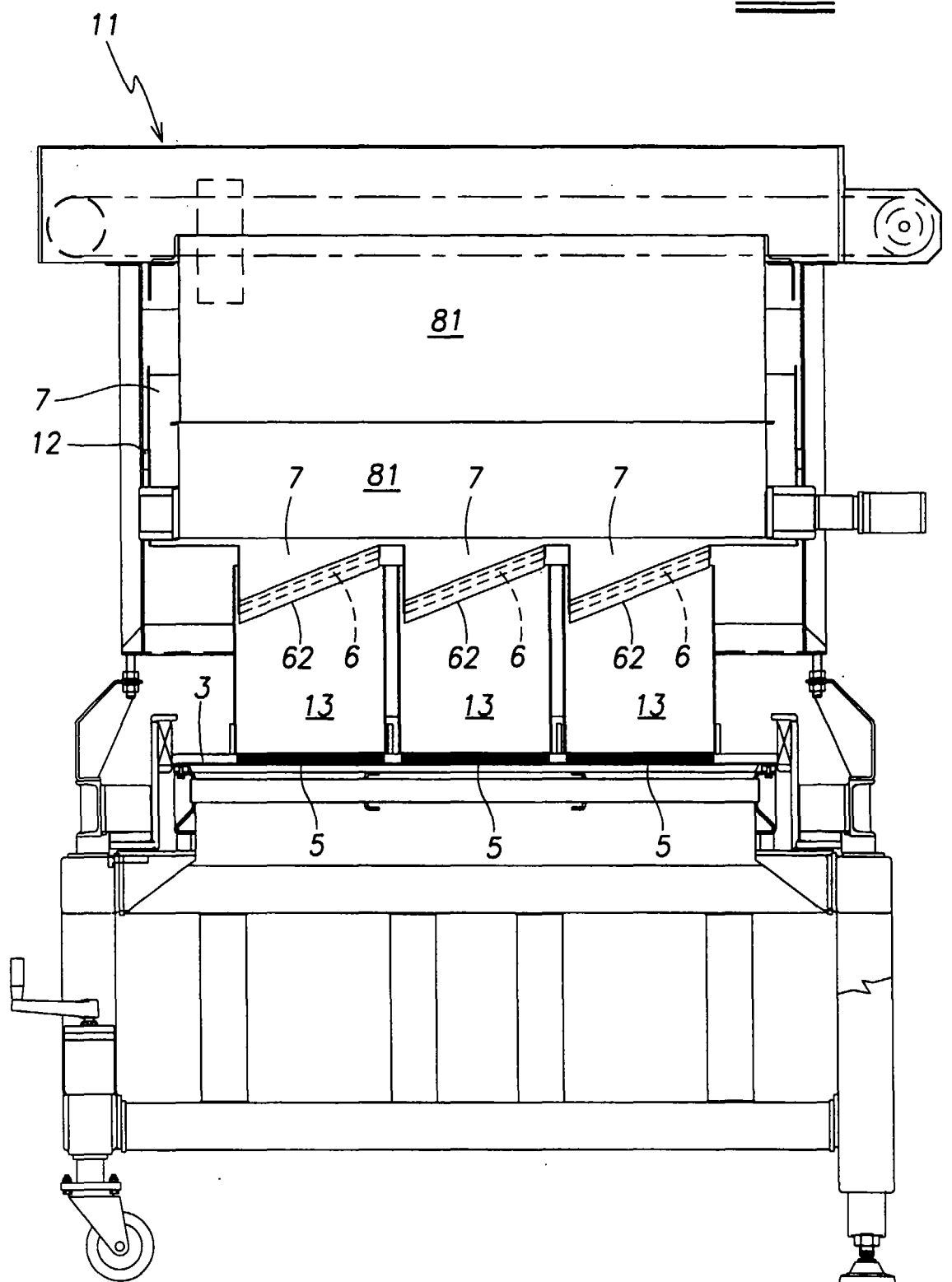


FIG.3



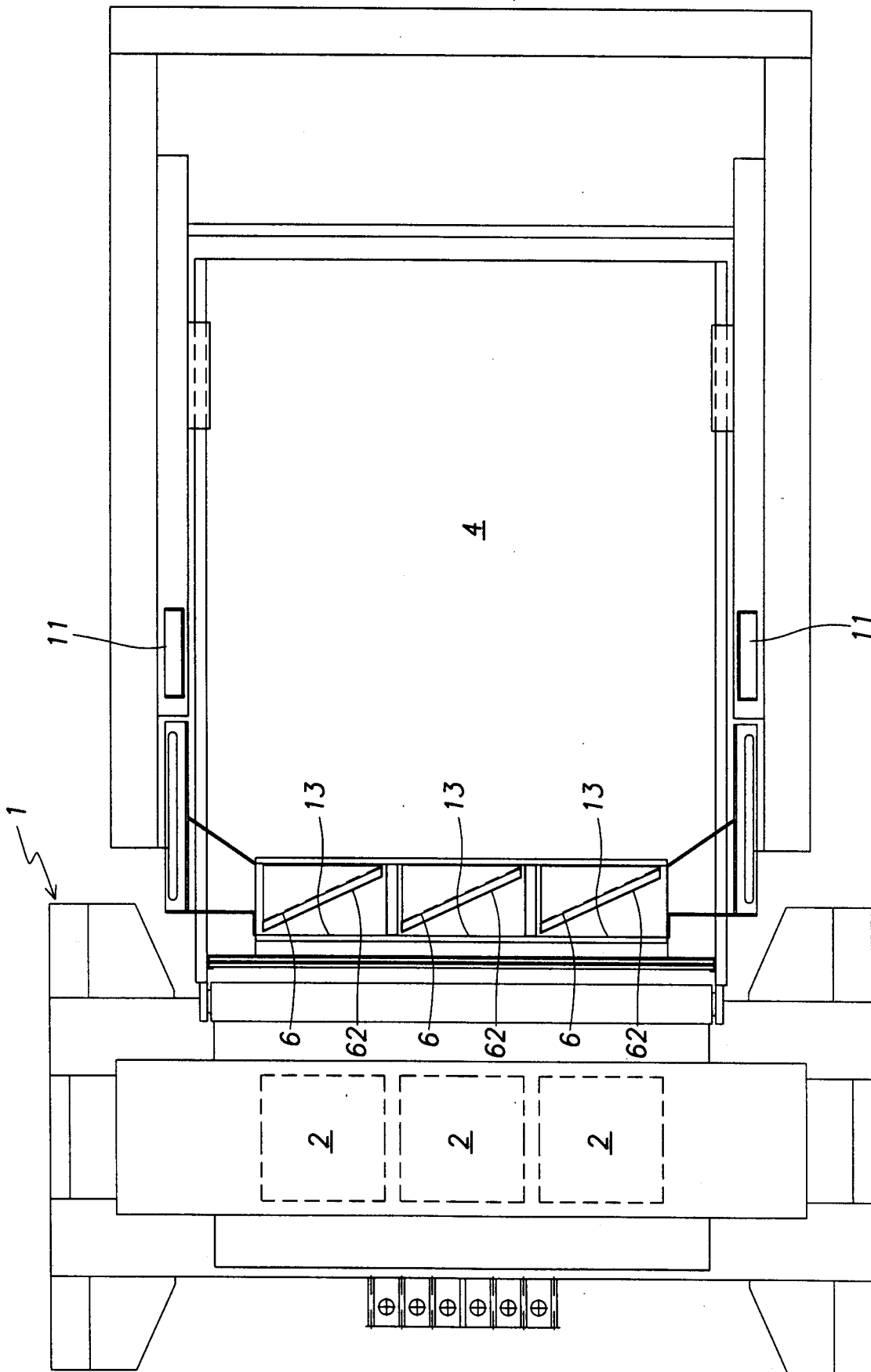
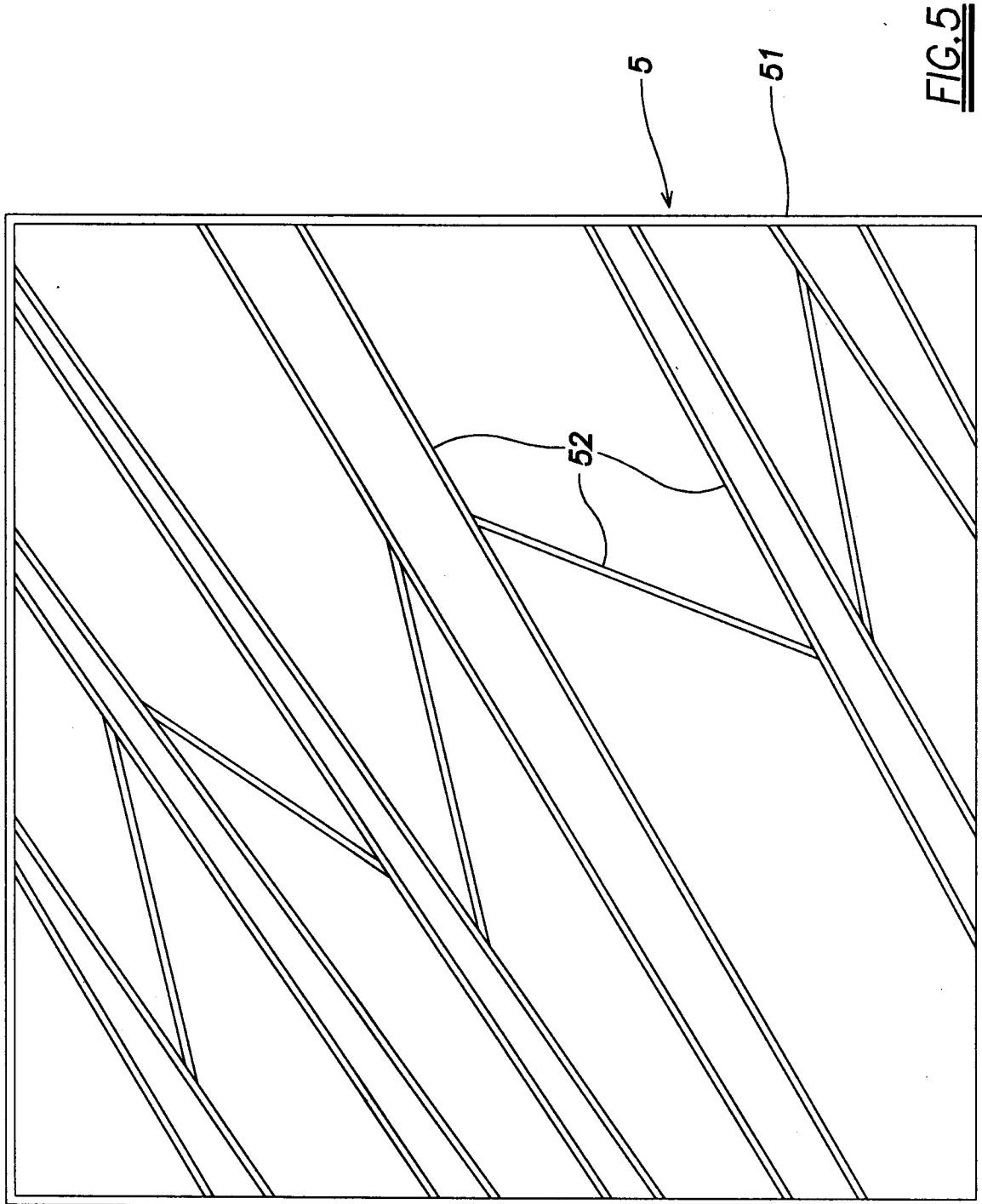


FIG. 4





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EUROPEAN SEARCH REPORT

Application Number
EP 97 20 2984

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.6)
A	US 1 727 580 A (E. H. WHITE) * the whole document * ---	1,4-6	B28B13/02
A	EP 0 605 930 A (MIRAGE CERAMICA SPA) * the whole document * ---	1	
A	GB L25592 A (L. ARCHER) & GB-A-25592 A.D. 1911 * the whole document * ---	1-3	
A	DD 126 956 A (E. KALIN) * the whole document * -----	1,6	
			TECHNICAL FIELDS SEARCHED (Int.Cl.6)
			B28B B30B
The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
THE HAGUE		4 February 1998	Gourier, P
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