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(54) **Method, charging device and press for the production of tiles with striping or veining in the mass**

(57) A method for the production of tiles with veining in the mass comprises the steps of charging powder into a vertical well to be pressed to form the tile mass and powder for formation of the veining in the mass, opening the well at the bottom to dump powder along a horizontal box translating with relative movement below it, and sending the box to a press for pressing of the powder therein. A press for pressing tiles in accordance with the method is equipped with a charging device (14) comprising a charging box (18) running between a rest position outside the press and a dumping position within the press. The device also comprises a vertical accumulation well (19) into which is fed powder for producing the tile mass and powder for achievement of veining in the mass and which on command dumps from its bottom into the box arranged beneath it during a relative translation movement between the box and the accumulation well.

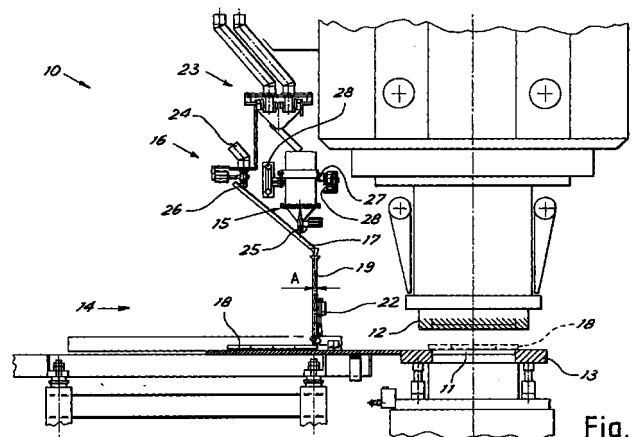


Fig. 1

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**Description**

**[0001]** The present invention relates to a method for the production of tiles with striping or veining in the mass and to a press and charging device employing this method.

**[0002]** In the production of tiles the problem of producing striping in the mass is known.

**[0003]** In the prior art various devices for depositing diversified layers of material to be pressed within the mold to seek to simulate the form and distribution of striping found e.g. in natural stone are known.

**[0004]** For example it has been proposed to provide a mold filling box with overturning movement so it could be filled in the vertical position and then brought to the horizontal position for the conventional operation of dumping into the mold. Filling can take place by successive layers of differently colored materials. For better distribution of the striping it has also been proposed to place distribution chutes between the charging hoppers and the dump box.

**[0005]** In a different embodiment it has been proposed to directly fill a vertical mold which would then be pressed laterally by a press with horizontal axis.

**[0006]** The prior art devices do not give fully satisfactory results, especially concerning the impression of naturalness of the striping.

**[0007]** The general purpose of the present invention is to remedy the above mentioned shortcomings by making available a method, a press and a charging device allowing achievement of tiles with veining or striping in the mass which would be highly natural and emerging on both major sides of the tile.

**[0008]** In view of this purpose it was sought to provide in accordance with the present invention a tile press comprising a pressing mold in which a charging device dumps powder to be pressed with the charging device comprising a charging box running between a rest position outside the press and a position within the press for dumping into the mold characterized in that it comprises a vertical accumulation well into which are fed powder for producing the tile mass and powder for achievement of veining in the mass and which on command dumps from below into the box arranged beneath it during a relative translation movement between the box and the accumulation well.

**[0009]** It was also sought to provide a method for the production of tiles with veining in the mass comprising the steps of charging into a vertical well powder to be pressed to form the tile mass and powder for formation of the veining in the mass, opening the well at the bottom to dump powder along a horizontal box translating below it with relative movement, and directing the box to a press for pressing of the powder therein.

**[0010]** To clarify the explanation of the innovative principles of the present invention and its advantages compared with the prior art there is described below with the aid of the annexed drawings a possible embod-

iment thereof by way of non-limiting example applying said principles. In the

drawings: FIG 1 shows a diagrammatic vertical front elevation view of a press with charging device in accordance with the present invention, FIG 2 shows a front view of the device of FIG 1, and FIG 3 shows a diagrammatic and cross sectioned side view of a detail of the device of FIG 1.

**[0011]** With reference to the FIGS a tile press indicated as a whole by reference number 10 comprises a pressing mold 11 arranged between pressing plates 12, 13 and into which a charging device with box 14 dumps powder to be pressed.

**[0012]** The charging device 14 comprises a main hopper 15 into which is fed the powder for producing the tile mass and at least one secondary hopper 16 into which is fed powder for production of striping or veining in the mass.

**[0013]** The main and secondary hoppers receive the respective powders from feeding units and ducts 23, 24.

**[0014]** The main hopper 15 and the secondary hopper 16 dump upon command, e.g. by means of powered dump gates 25, 26, into a chute 17 for sending the powder to the charging box 18 which runs between a rest position shown in solid lines in FIG 1 outside the press plates and a position shown in broken lines for dumping into the mold. Movement of the box mounted e.g. on a powered carriage and dumping of the powder therefrom into the mold are achieved with known devices and methods readily imaginable for those skilled in the art and therefore not further described nor shown in detail herein.

**[0015]** In accordance with the principles of the present invention, between the chute and the box is arranged an intermediate accumulation well 19 extending vertically which receives at the top the powder dumped from the chute and in turn dumps it on command from the bottom into the box arranged beneath it during movement of the box 18 from its rest position to its position for dumping into the mold. Advantageously the box 18 has vertical dividing baffles 31 in it.

**[0016]** The accumulation well 19 has a generally parallelepiped form with dimension A in the direction of movement of the box which is virtually near the internal height of the box and transversal width B virtually near the transversal internal width of the box.

**[0017]** As may also be seen well in FIG 3, for the commanded dumping the accumulation well 19 has a bottom dumping mouth 20 closed by a dump gate 21 extending the entire transversal width of the well and powered by means of an actuator 22.

**[0018]** As shown clearly in FIG 2 the main hopper 15 and the secondary hopper 16 translate transversely along the chute 17 by means of a motorized carriage 27 running on guides 28 to distribute the dumping of the

respective powders into the chute.

**[0019]** Again as may be seen in FIG 2 the charging device can be multiple to serve pressing molds with multiple imprints.

**[0020]** FIG 2 shows for example three charging units 14a, 14b, 14c which are virtually identical. 5

**[0021]** As may be seen well in FIG 3 the powder charging takes place by charging into the vertical well 19 the powder 29 to be pressed to form the tile mass and powder 30 to form the veining in the mass. Distribution takes place in different quantities and at different intervals depending on the specific aesthetic effect it is desired to achieve. 10

**[0022]** Once the well is charged, the gate 21 is opened to dump the powder along the horizontal box 18 which at the same time translates beneath the well to move to the position of dumping into the mold. In this manner the box is filled with distribution of the striping predetermined in the vertical well during its charging. 15

**[0023]** It is now clear that the predetermined purposes have been achieved. It has been found that charging performed in accordance with the method and the device described above achieves aesthetic results qualitatively much better than those achievable by the prior art. In particular the striping obtained in the mass and emerging on both sides of the tile have a much more natural and aesthetically pleasing appearance. 20 25

**[0024]** Naturally the above description of an embodiment applying the innovative principles of the present invention is given by way of non-limiting example of said principles within the scope of the exclusive right claimed here. For example although movement of the box beneath the intermediate well 19 is to be preferred to optimize cycle times, for the purposes of charging in accordance with the present invention the reciprocal movement should be understood as relative movement. The well can therefore be provided in such a manner that it would be movable to run above the box. 30 35

## Claims 40

1. Tile press comprising a pressing mold into which a charging device (14) dumps powder to be pressed with the charging device (14) comprising a charging box (18) running between a rest position outside the press and a position within the press for dumping into the mold characterized in that it comprises a vertical accumulation well (19) into which is fed powder for producing the tile mass and powder for achievement of veining in the mass and which on command dumps from its bottom into the box arranged beneath it during a relative translation movement between the box and the accumulation well. 45 50
2. Press in accordance with claim 1 characterized in that it comprises upstream of the well (19) a main hopper (15) into which is fed the powder for produc-

ing the tile mass and at least one secondary hopper (16) into which is fed powder for producing veining in the mass with the main hopper (15) and at least one secondary hopper (16) dumping into a chute (17) for directing the powder to said accumulation well (19).

3. Press in accordance with claim 1 characterized in that the accumulation well (19) is generally formed like a parallelepiped with the dimension in the direction of movement of the box (18) which is virtually near the internal height of the box and transversal width virtually near the transversal internal width of the box. 10
4. Press in accordance with claim 2 characterized in that the main hopper (15) and the secondary hopper (16) run transversely along the chute (17) to distribute the dumping of the respective powder thereon. 15
5. Press in accordance with claim 1 characterized in that for the controlled dumping the accumulation well (19) has a bottom dumping mouth (20) closed by a powered dumping gate (21). 20 25
6. Press in accordance with claim 1 characterized in that the box (18) has in it vertical dividing baffles (31). 30
7. Method for the production of tiles with veining in the mass comprising the following steps:
  - charging into a vertical well powder to be pressed to form the tile mass and powder for formation of the veining in the mass,
  - opening the well at the bottom to dump powder along a horizontal box translating with relative motion below it, and
  - sending the box to a press for pressing of the powder therein. 35 40
8. Methods in accordance with claim 7 in which the accumulation well (19) is filled by dumping the powder into it through a chute (17) into which the powder is charged from hoppers (15,16). 45
9. Method in accordance with claim 7 in which the vertical well has a dimension in the direction of relative movement of the box which is virtually near the height of the box. 50
10. Device for charging powder to be pressed into the mold of a tile production press and comprising a charging box (18) running between a rest position outside the press and a position of dumping into the mold inside the press characterized in that it comprises a vertical accumulation well (19) into which is 55

fed powder for production of the tile mass and powder for production of veining in the mass and which on command dumps from the bottom into the box arranged beneath it during relative translation movement between the box and the accumulation well. 5

11. Device in accordance with claim 10 characterized in that it comprises upstream of the well (19) a main hopper (15) into which the powder for production of the tile mass is fed and at least one secondary hopper (16) into which powder for production of veining in the mass is fed with the main hopper (15) and at least one secondary hopper (16) dumping into a chute (17) for conveyance of the powder to said accumulation well (19). 10 15
12. Device in accordance with claim 10 characterized in that the accumulation well (19) is generally in the form of a parallelepiped with the dimension in the direction of movement of the box which is virtually near the internal height of the box and transversal width virtually near the transversal internal width of the box. 20 25
13. Device in accordance with claim 10 characterized in that the main hopper (15) and the secondary hopper (16) run transversely along the chute (17) to distribute the dumping of the respective powder therein. 30
14. Device in accordance with claim 10 characterized in that for the controlled dumping the accumulation well (19) has a bottom dumping mouth (20) which is closed by a powered dump gate (21). 35

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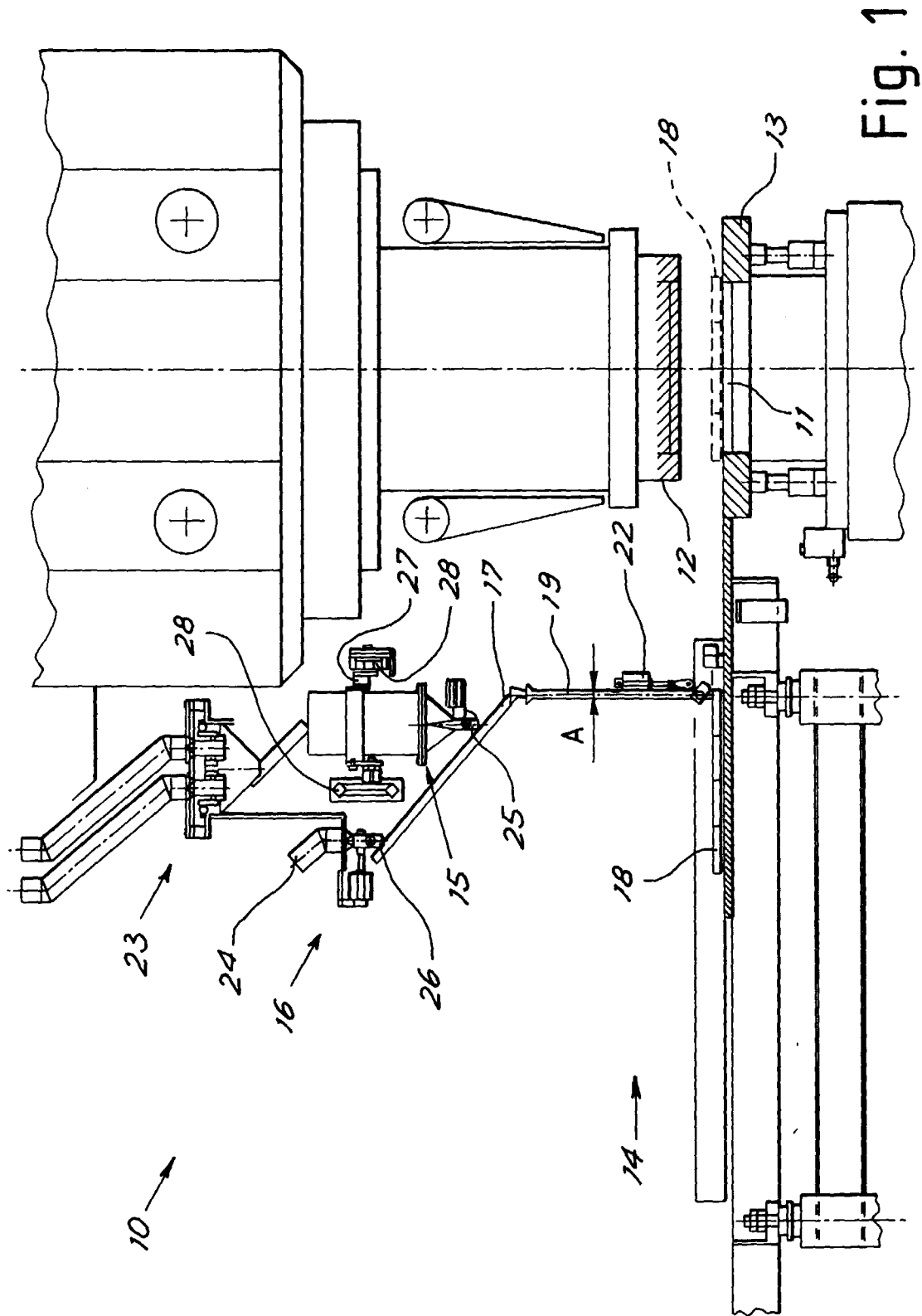


Fig. 1

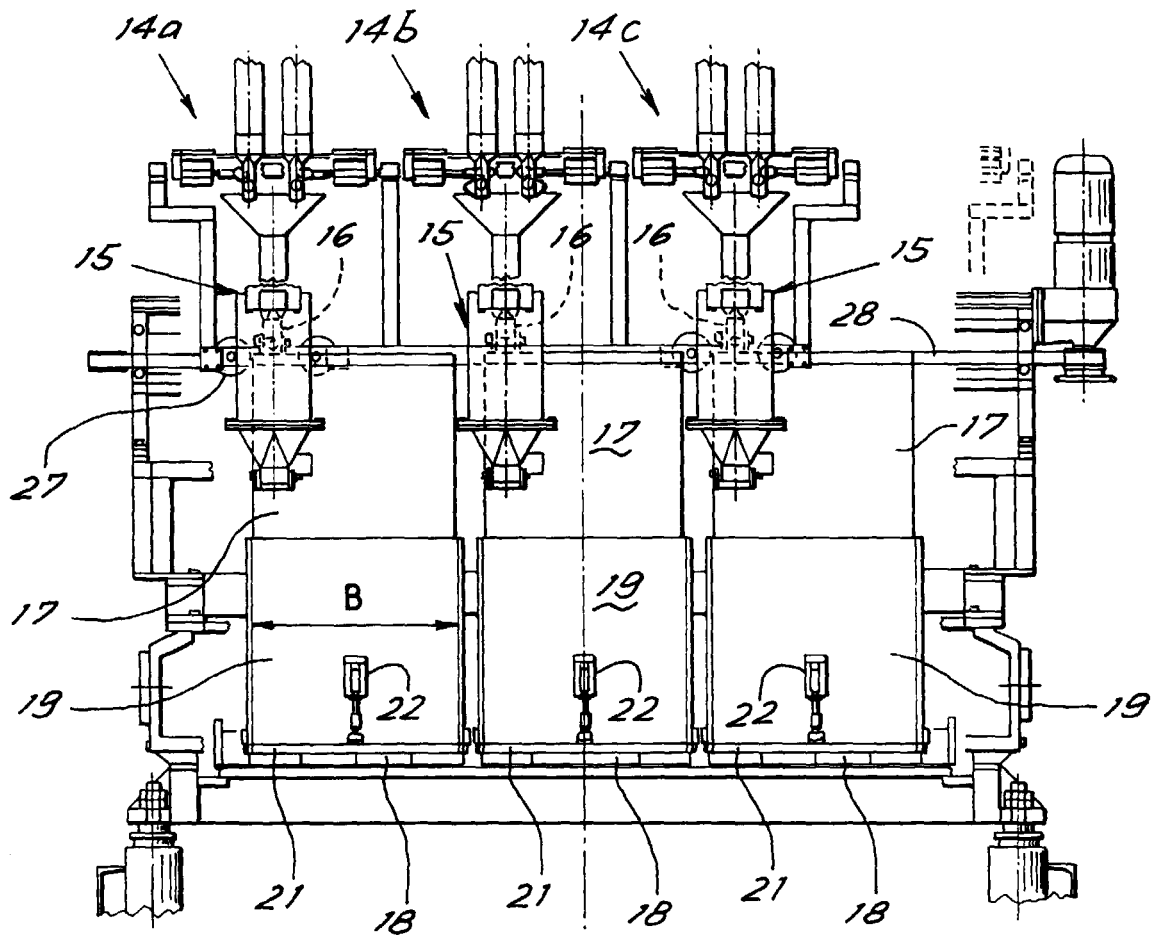


Fig. 2

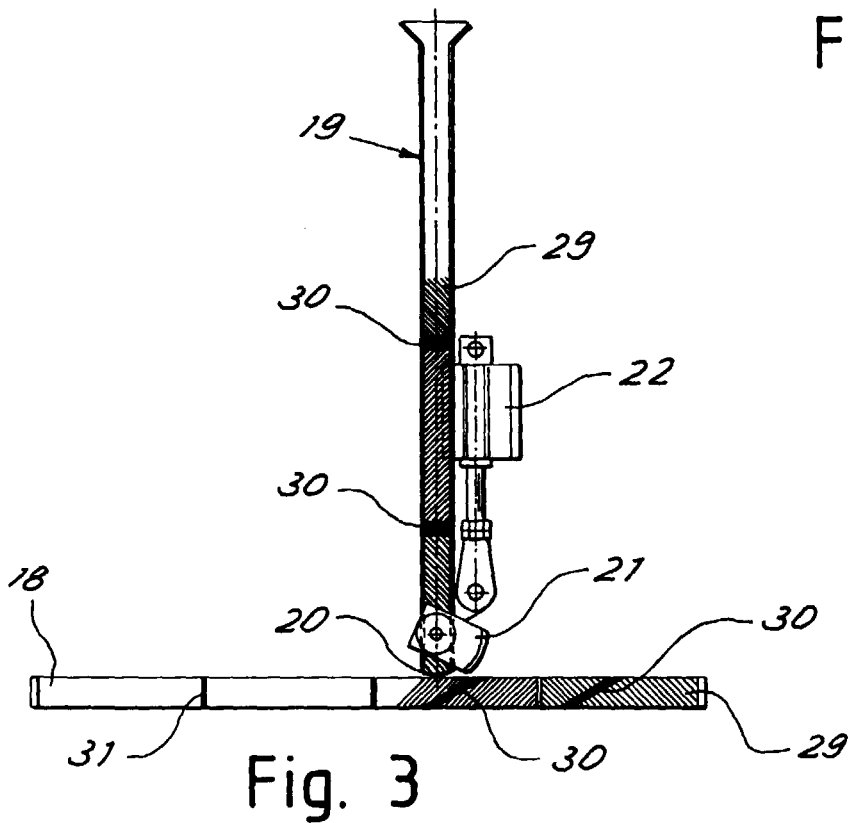


Fig. 3