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(54) **Tile production press with two-layer charging device**

(57) A ceramics press with a device for charging the mold comprises a conveyor box (14) moving between a position for reception of powder therein and a position for dumping the powder into the mold. The device comprises a hopper (17) moving with the box (14) to transit above the mold during movement of the box and com-

mandable for release into the mold of additional powders loaded therein. It is thus possible to achieve a surface layer of powder over the layer forming the body of the ceramic product.

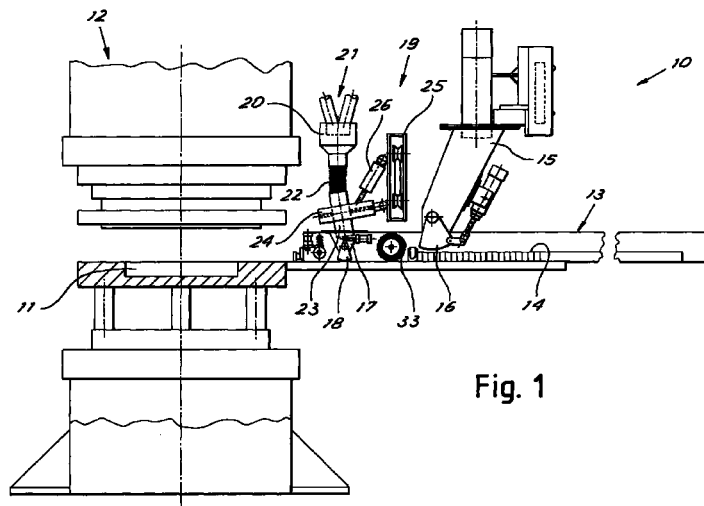


Fig. 1

Description

[0001] The present invention relates to a tile production press and a device for charging powder into the mold which allows achievement of a diversified surface layer to obtain tiles with special surface effects.

[0002] In ceramic presses it is customary to charge powder into the molds through a containing box or grating which from a powder charging position moves with rectilinear motion to a position of dumping into the mold for formation of the tile.

[0003] It has also been proposed to charge into the grating powders of different colors to obtain special effects such as striping in the tile mass in accordance with more or less complex schemes.

[0004] This system however does not produce special surface effects. Indeed, moving the charge from the box to the mold compromises metering and distribution of the surface layer.

[0005] The general purpose of the present invention is to remedy the above mentioned shortcomings by making available a press and charging system with distribution of surface layers of powder allowing achievement of special surface effects.

[0006] In view of this purpose it was sought to provide in accordance with the present invention a press with a device for charging a mold therein comprising a conveyor box moving between a reception position for powder therein and a position for dumping the powder into the mold characterized in that the charging device comprises a hopper moving with the box to transit above the mold during movement of the box and commandable for release into the mold of additional powders loaded therein.

[0007] 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 embodiment thereof by way of non-limiting example applying said principles. In the drawings:

FIG 1 shows a diagrammatic side elevation view of a charging system in accordance with the present invention,

FIG 2 shows a view similar to that of FIG 1 but with the device in a different operating position,

FIG 3 shows a diagrammatic plan view of a detail of the device of FIG 1, and

FIG 4 shows a cross section view along plane of cut IV-IV of FIG 3.

[0008] With reference to the FIGS FIG 1 shows a press 12 equipped with a charging device indicated as a whole by reference number 10 for a mold 11 of the press. The charging device comprises a powered unit or carriage 13 which translates between a charging position (FIG 1) and a dumping position (FIG 2).

[0009] The powered unit comprises in turn a con-

veyance box or grating 14 which upon movement of the unit 13 shifts between a position for reception of powder and a position for dumping of the powder into the mold. The box receives the powder from a hopper 15 located in the reception position and equipped with controlled dumping means 16.

[0010] The charging system comprises an auxiliary hopper 17 moving with the box 14 to transit above the mold 11 during movement of the box and equipped with dumping means 18 to be commanded to release into the mold 11 additional powder charged into the auxiliary hopper 17. The auxiliary hopper is advantageously arranged in front of the box in the direction of movement towards the mold. This hopper has a front imprint such as to be introducible between the plates of the open press.

[0011] When the box 14 is in the reception position beneath its hopper 15 the auxiliary hopper 17 is opposite means 19 of feeding therein of additional powder.

[0012] The feeding means 19 comprise a conveyor 20 which receives powder from ducts 21 and sends it through a flexible duct 22 to a delivery mouth 23 equipped with a controlled cutoff valve 24. The feeding unit making up the means 19 moves along guides 25 in a direction transversal to that of movement of the charging unit 13 and therefore in a direction at right angles to the plane of the drawing shown in FIG 1 so as to run along the entire extension of the hopper 17. If necessary the powder fed can be of a different color for different positions along the hopper 17 so as to achieve differently colored surface effects.

[0013] The delivery mouth 23 is movable vertically by means of an actuator 26 so it can be lowered into the hopper during feeding as shown in FIG 1 and then withdrawn as seen in FIG 2 to allow movement of the charging unit 13.

[0014] As may be seen in FIGS 3 and 4 the auxiliary hopper 17 can be equipped with mixing paddles moving longitudinally and alternately with respect to the main axis of the hopper through an actuator 28. Depending on the flowability of the additives the paddles can have different configurations. Air vibrators can also be applied.

[0015] The auxiliary hopper 17 can have on its outlet a dumping grating 29 and the dump valve 18 can be shaped as desired to dump the contents of the hopper in a predetermined manner.

[0016] Advantageously, in front of the auxiliary hopper 17 there can be a roller 30 operated by an actuator 31.

[0017] In addition to or in replacement of the roller 30 there can be between the auxiliary hopper and the box a roller 30b with its own actuator 31b. The roller 30b and if desired the roller 30 are equipped with peripheral projections 31.

[0018] In use the charging device is initially in the position of FIG 1. In this position the feeder 19 runs along the auxiliary hopper dumping the additive powder

therein.

[0019] After charging, the dispenser 23 is raised and the carriage 13 begins the run towards the dumping position. The main upper hopper 15 charges the box or grating 14 in accordance with the prior art.

[0020] During the advance which takes the grating 14 over the mold matrix recesses, any mold cleaning means can be activated.

[0021] These means can be made e.g. with movable rotating brushes 33 located between the box and the auxiliary hopper.

[0022] Thus the powder delivered by the main hopper is charged into the mold.

[0023] Once the carriage 13 has reached the fully advanced position (FIG 2) its return travel can begin.

[0024] During return travel the auxiliary hopper 17 which had advanced together with the box returns above the mold and is operated to dump its contents over the material already charged into the mold so as to form a different surface layer.

[0025] During return travel it is possible to operate the front roller 30 to achieve compression of the powder and better compactness. If desired, simultaneously or alternating with the roller 30 the roller 30b if any can produce incisions 32 in the powder before it is reached by the auxiliary hopper so that the auxiliary hopper will dump into the grooves produced. In this manner original aesthetic effects can be achieved.

[0026] It is now clear that the predetermined purposes have been achieved by making available a charging system allowing achievement of a surface layer differentiated from the remaining mass of the pressed ceramic product with speed and optimal and constant qualitative results. It is noted that by depositing the surface layer during return of the main charging carriage the charging speed is near that of a single-layer prior art device.

[0027] 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 there can be any number and arrangement of recesses in the mold in accordance with the normal ceramic product pressing technique. In front of the charging unit there can be a mobile scraper for cleaning the sliding surface.

[0028] The valve 18 of the auxiliary hopper can be a slide valve.

Claims

1. Press (12) with a device (10) for charging a mold (11) therein comprising a conveyor box (14) moving between a reception position for powder therein and a position for dumping the powder into the mold characterized in that the charging device (10) comprises a hopper (17) moving with the box to transit above the mold during movement of the box and

commandable for release into the mold of additional powders loaded therein.

2. Press in accordance with claim 1 characterized in that the hopper (17) is arranged in front of the box (14) in the direction towards said dumping position.

3. Press in accordance with claim 1 characterized in that when the box (14) is in the reception position the hopper (17) is opposite the means (19) of feeding therein said additional powder.

4. Press in accordance with claim 3 characterized in that the feeding means (19) comprise a conveyor (20) which receives powder and sends it to a delivery mouth (23) equipped with a controlled cutoff valve (24) with the delivery mouth (23) moving between an operating position near the hopper and a non-operating position far from the hopper.

5. Press in accordance with claim 4 characterized in that the delivery mouth (23) is powered to translate along the extension of the hopper (17) during delivery of the powder into it.

6. Press in accordance with claim 1 characterized in that in the hopper (17) there are mixing means (27) for mixing the powder therein.

7. Press in accordance with claim 1 characterized in that between the box (14) and the hopper (17) there is a roller (30b) with shaped periphery and drivable during return of the box towards the reception position to produce incisions on a layer of powder dumped in the mold from the box.

8. Press in accordance with claim 1 characterized in that the hopper (17) is between the box (14) and a roller (30) drivable during return of the box towards the reception position to press the powder dumped from the hopper on the powder previously dumped into the mold from the box.

9. Press in accordance with claim 1 characterized in that between the box (14) and the hopper (17) there are mold cleaning means (33).

10. Press in accordance with claim 1 characterized in that the box (14) dumps into the mold during the outwards run and the hopper (17) dumps into the mold during the return run towards the charge position.

11. Press in accordance with claim 1 characterized in that above said reception position of the box (14) there are hopper means (15) for loading powder into the box.

12. Device for charging a mold (11) in a ceramics press which comprises a conveyor box (14) moving between a powder reception position and a position for dumping the powder into the mold characterized in that the charging device (10) comprises a hopper (17) moving with the box to transit above the mold during movement of the box and commandable to release into the mold additional powder filled into the hopper (17).

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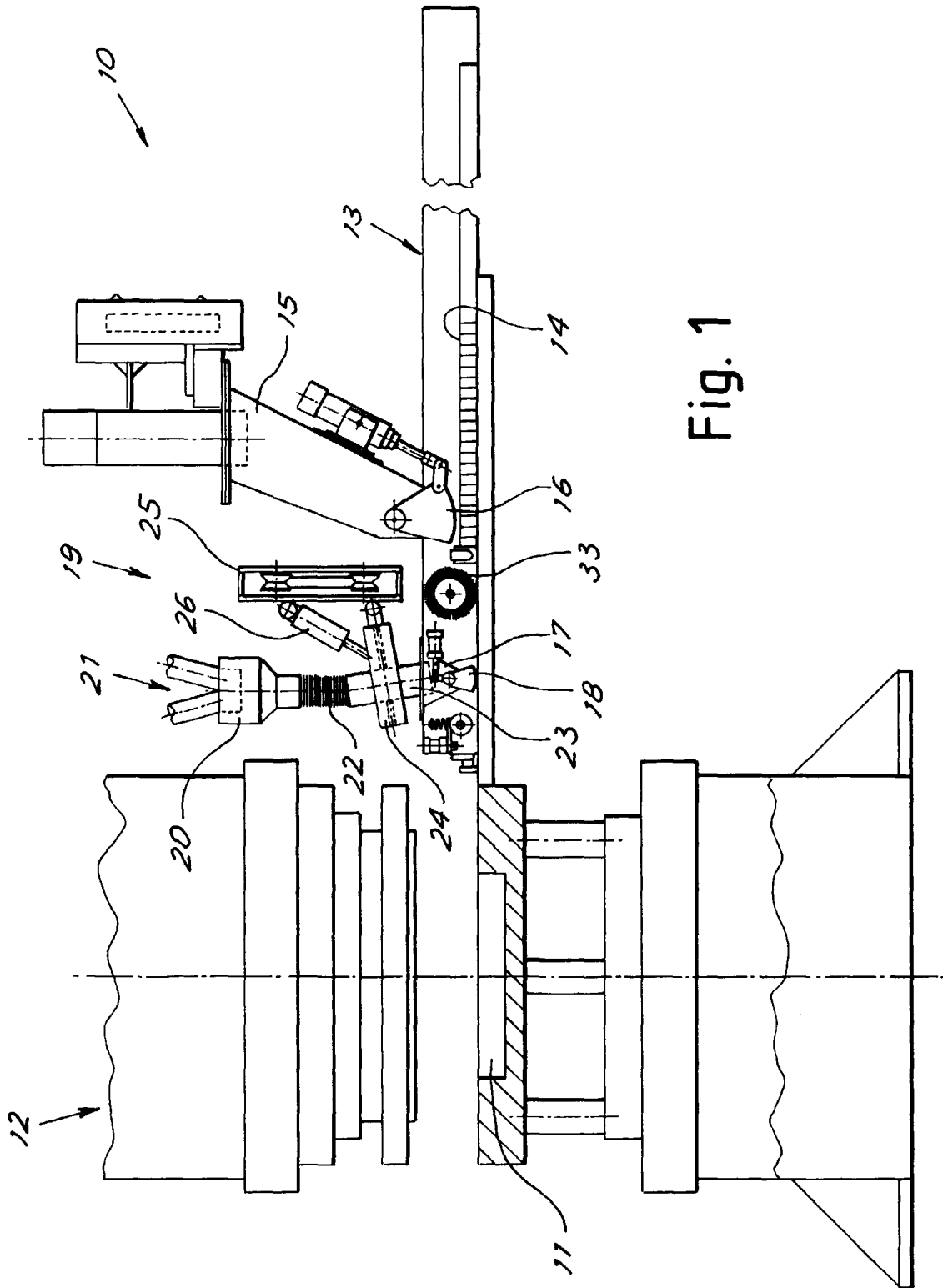


Fig. 1

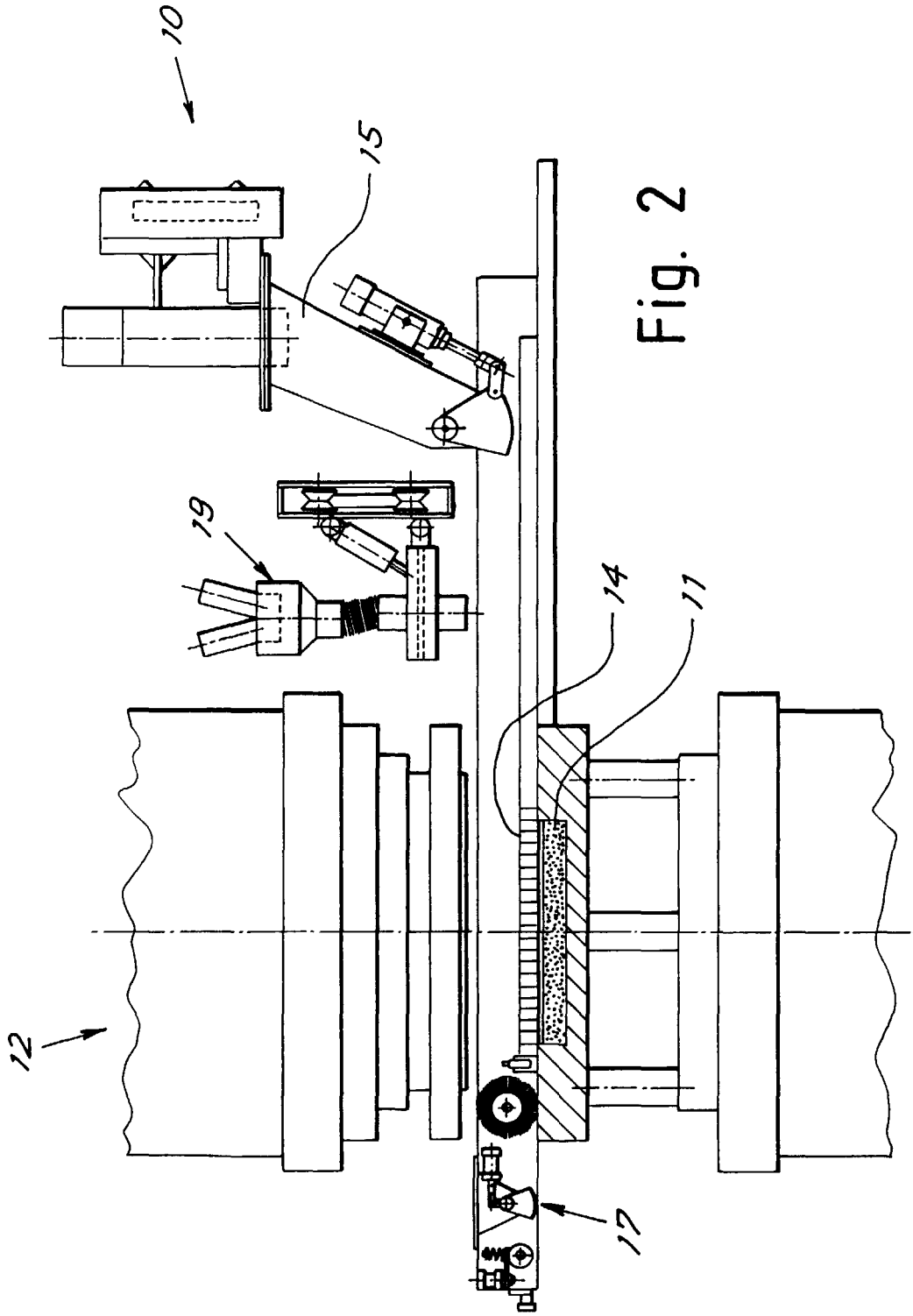


Fig. 2

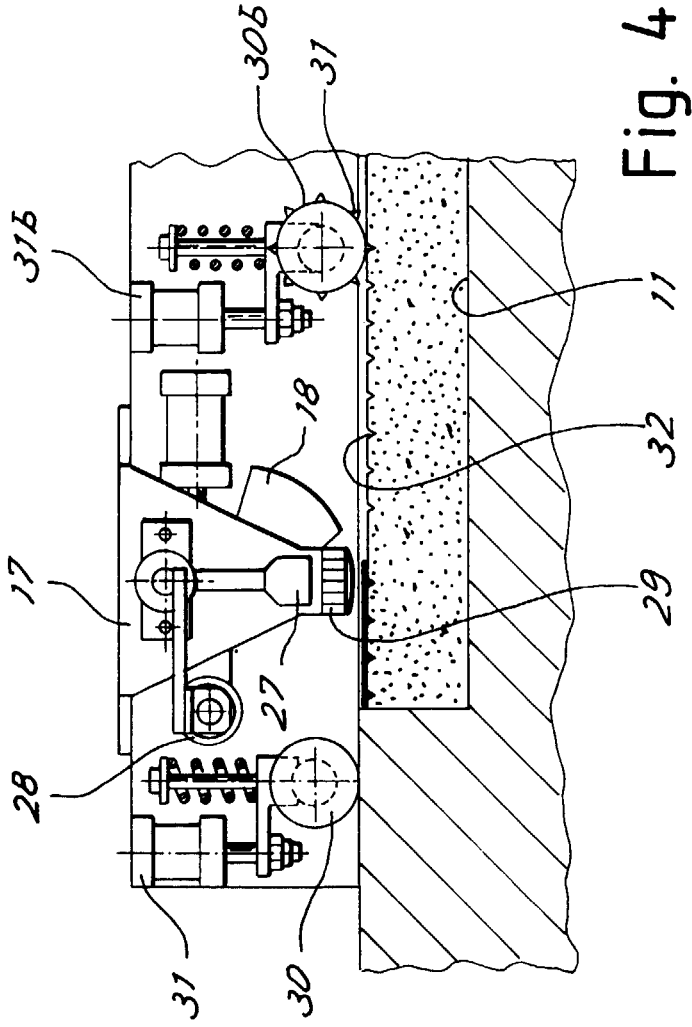


Fig. 4

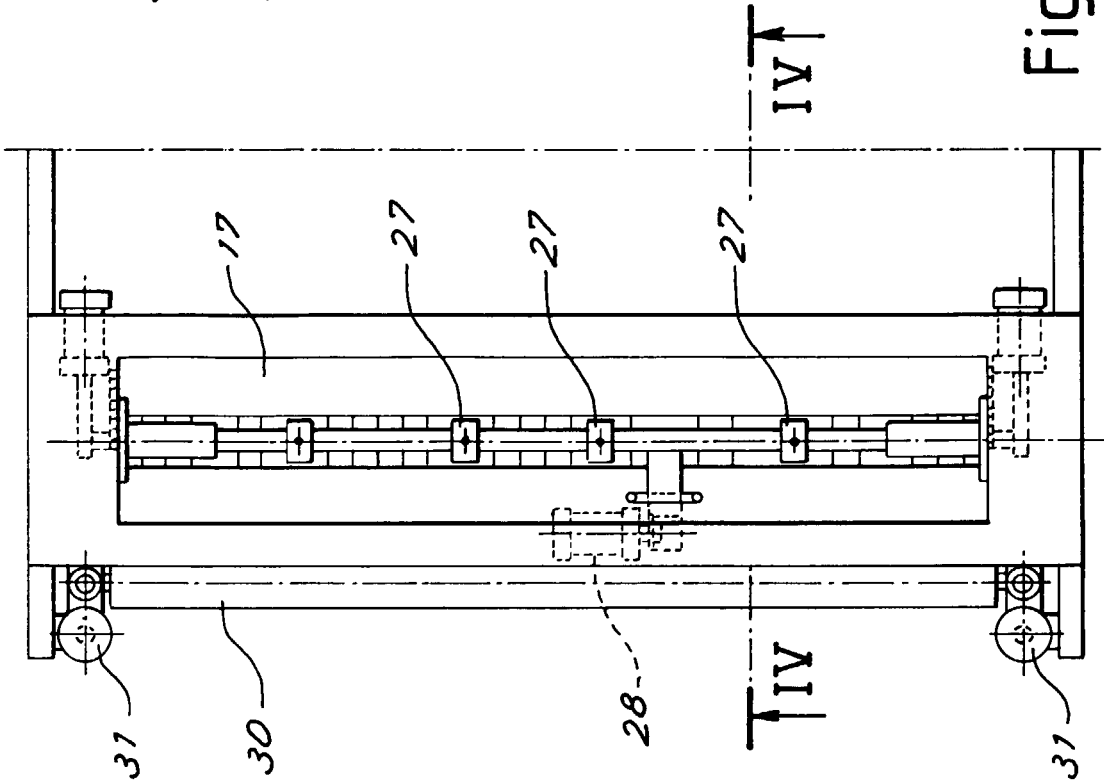


Fig. 3