

Description

[0001] The invention relates to an apparatus for supplying a forming cavity of a ceramic press for producing tiles.

[0002] The invention further relates to a ceramic slab, in particular a tile.

[0003] As part of the production of vitrified stoneware tiles, and in particular of tiles of large size, i.e. tiles with a substantially rectangular shape having a longitudinal dimension that is noticeably greater than a transverse dimension, that are suitable for covering large surfaces such as those of railway stations, airports, etc., ornamental effects are notably requested that reproduce the veining of natural stone or marble.

[0004] A drawing comprising veining can be obtained by means of known apparatuses provided with a sliding grid on a sliding plane and moved by a carriage between a loading zone, in which the grid receives from a hopper ceramic powder to be pressed, and a pressing zone in which the grid releases the ceramic powders to be pressed inside a forming cavity. The ceramic powders are previously arranged in the hopper in layers of various colours such that during movement of the grid to the forming cavity the ceramic powders of a given colour become attached to slats, with which the grid is provided, shaped according to the veining that it is desired to obtain.

[0005] A drawback of known apparatuses is that, in order to produce ceramic tiles having different patterns from one another, the grid has to be dismantled from the apparatus, thus causing the apparatus to stop.

[0006] Furthermore, the manufacturer of ceramic tiles has to procure a grid for each drawing that he wishes to obtain.

[0007] Still a further drawback of known apparatuses is that the tiles produced with a certain grid appear to be repetitive to a certain degree and are all traceable to the specific type of grid used, inasmuch as they reproduce the arrangement of the slats with which that grid is provided.

[0008] Still a further drawback of known apparatuses that use a grid is that in order to obtain the drawing formed by the ceramic powders on the front face of the ceramic tile the surface of the tile has to be polished.

[0009] The state of the art comprises further apparatuses for supplying a forming cavity for producing ceramic tiles, so-called "double loading" apparatuses, by means of which a layer of decorative material that is suitable for defining a decoration on the ceramic tile is applied to a base layer of ceramic powders during supplying of the forming cavity.

[0010] A drawback of the aforesaid apparatuses is that it is not possible to obtain longitudinal veining on tiles of big size.

[0011] An object of the present invention is to improve known apparatuses for supplying a forming cavity of a ceramic press for producing tiles.

[0012] Another object is to produce an apparatus that

enables longitudinal veining to be obtained on a ceramic tile having a longitudinal dimension that is noticeably greater than a transverse dimension.

[0013] A further object is to provide an apparatus that enables a decoration to be modified that is to be produced on a ceramic tile without it being necessary to dismantle parts of the apparatus.

[0014] Still another object is to produce an apparatus that enables a decoration to be obtained on the front face of a ceramic tile without having to polish the surface of the tile.

[0015] Another object is to obtain a ceramic slab of relatively large dimensions having ornamental effects that reproduce the appearance of natural stone such as marble or travertine.

[0016] In a first aspect of the invention, an apparatus is provided comprising flexible supporting means, suitable for supporting loose ceramic material to be pressed, containing means arranged for loading said flexible supporting means with said loose ceramic material and further comprising movement means, such as to move said flexible supporting means along a movement direction between a loading position, in which said flexible supporting means is nearer said containing means and a pressing position, in which said flexible supporting means is further from said containing means, said apparatus further comprising driving means such as to drive said containing means along a direction transverse to said movement direction.

[0017] Owing to the first aspect of the invention, it is possible to arrange the loose ceramic material so that on the flexible supporting means a pattern is formed that extends transversely with respect to the movement direction.

[0018] By supplying a forming cavity of a ceramic press along the movement direction with the apparatus according to the invention, this forming cavity, having a main dimension that extends substantially orthogonally to the movement direction, it is thus possible to form a ceramic tile having a front face, i.e. a face intended to be in view during use, provided with a pattern that reproduces the veining or the blotches of natural stone, such veining or blotches extending longitudinally on the front face of the ceramic tile.

[0019] In particular, it is possible to produce ceramic tiles of a big size having veining that is not traceable to production by means of a grid.

[0020] In a second aspect of the invention, a rectangular slab is provided, comprising a decoration made of ceramic material pressed into a base body, said slab having a longer edge and a shorter edge having a length of at least 60 cm, said decoration being provided with zones of a colour distributed in said base body substantially parallelly to said longer edge.

[0021] In an embodiment, a zone or a group of said zones is more extended in a direction transverse to said longer edge of a further zone or of a further group of said zones.

[0022] In a further embodiment, the colour zones are dispersed in further zones of a further colour and/or of said base body.

[0023] In a third aspect of the invention, a plurality of slabs is provided, each slab of said plurality of slabs being rectangular, comprising a decoration made of ceramic material pressed into a base body and having a longer edge and a shorter edge having a length of at least 60 cm, said decoration being provided with zones of a colour distributed in said base body substantially parallelly to said longer edge, characterised in that zones of a colour of a slab of said plurality of slabs are arranged in a different position compared with longitudinally corresponding zones of another slab of said plurality of slabs.

[0024] In an embodiment, said decoration is applied to said plurality of slabs with the same apparatus.

[0025] The invention can be better understood and implemented with reference to the attached drawings, which illustrate some embodiments thereof by way of non-limiting example, in which:

Figure 1 is a side view of an apparatus for supplying a forming cavity of a ceramic press;

Figure 2 is a front view of a portion of the apparatus in Figure 1;

Figure 3 is a top view of the portion in Figure 2;

Figure 4 is an enlarged detail illustrating containing means provided in the apparatus in Figure 2;

Figures 5 to 8 are front views like the one in Figure 2 illustrating a part of the apparatus in Figure 1 in successive operating positions;

Figures 9 to 11 are partial views of the containing means according to the direction H in Figure 2 in successive motion configurations;

Figures 12 and 13 are top views of an embodiment of the containing means provided in the apparatus in Figure 1;

Figure 14 is a partial view of a section taken along the plane XIV-XIV in Figure 12;

Figures 15 to 18 are top views of slabs provided with a decoration obtainable by means of the apparatus 1.

[0026] With reference to Figures 1 to 4, there is illustrated an apparatus 1 for supplying a forming cavity 2 of a ceramic press 6, for producing ceramic tiles.

[0027] The apparatus 1 is provided with movement means comprising in particular a carriage 26 arranged for moving loose ceramic material to be pressed to supply the forming cavity 2 along a movement direction indicated by the arrows F1 and F2 in Figure 1 and in Figure 3. The carriage 26, driven by motor means that is not shown, is movable along the direction F1 between a loading position, illustrated in Figure 1 and in Figure 3, in which the loose ceramic material is loaded onto the carriage 26 and a pressing position, not shown, in which the loose ceramic material is transferred from the carriage 26 inside the forming cavity 2. From the pressing position the carriage 26 returns to the loading position, moving along the

direction F2 to be loaded again with loose ceramic material.

[0028] The loose ceramic material can comprise ceramic powders of various shapes and colours such as atomised powders, granules, chips, frit, glaze and other material.

[0029] The apparatus 1 enables a plurality of layers of ceramic powder to be obtained inside the forming cavity 2, in particular a base layer and a decorative layer, according to a technique known as "double loading". The base layer defines much of the thickness of the pressed ceramic tile, whereas the decorating layer defines a decoration on the front face of the ceramic tile, i.e. the face intended to be in view during use.

[0030] The ceramic powder intended for forming the base layer is contained inside a base hopper 29 suitable for loading a grid 27 by means of a movable baffle 40. The grid 27, moved by the carriage 26, is slidable on a sliding plane 28 as far as above the forming cavity 2, in which the ceramic powder is deposited.

[0031] The ceramic powder intended for forming the decorating layer is contained in containing means 4 such as to distribute the ceramic powder on flexible supporting means for forming a layer that is the precursor of the decorating layer. The flexible supporting means may be of continuous type, such as a belt 41 of a conveyor belt 3, or of discrete type, such as sheets, for example of plastics. The belt 41 is wound around a pair of rollers 39, said pair of rollers 39 comprising a drive roller arranged for rotating the belt 41 such that a substantially flat portion of the belt 41 is movable in a direction parallel to the movement direction F1. The conveyor belt 3 is further moved along the movement direction F1, F2, by the carriage 26 alternatively between the loading position, in which the conveyor belt 3 is nearer the containing means 4, and the pressing position, in which the conveyor belt 3 is further from the containing means 4, in particular the conveyor belt 3 is arranged above the grid 27 at the forming cavity 2. From this position, during motion of the carriage 26 to the loading position, along the direction F2 the belt 41 is rotated so as to pour into the forming cavity 2, above the base layer previously deposited by the grid 27, the precursor layer of the decorating layer.

[0032] During the transfer of the decorating material to the forming cavity 2, the arrangement of the previously prepared ceramic powders on the flexible support does not undergo substantial variations.

[0033] The apparatus 1 can supply the forming cavity 2 as disclosed in RE2004A000097. The containing means 4 is movable along a direction indicated by the arrows T1 and T2, in Figures 2 and 3, transversally to the movement direction F1, F2, alternatively between a first filling position A, illustrated in Figures 2, 3 and 4, and a second filling position B, illustrated in Figures 7 and 8, driven by driving means 20.

[0034] The driving means 20 comprises a motor 22, a shaft 42 and transmission means 43. The transmission means 43 comprises a transmission belt 23 that can

transmit motion to a frame 24 arranged for supporting the containing means 4. To the frame 24 an element 44 is fixed that is provided with wheels, which are not shown, that run on a guiding bar 25.

[0035] The containing means 4 comprises a hopper 5, having an outlet opening 7 for the exit of the loose ceramic material to be deposited on the belt 41.

[0036] Between the hopper 5 and the belt 41 there is provided a screening element 8, comprising a frame 9 and an opening 10, for example of rectangular shape, having dimensions substantially corresponding to those of the forming cavity 2.

[0037] In the first filling position A and in the second filling position B the outlet opening 7 faces respectively a first frame 47 portion 9 and a second frame 48 portion 9, the second portion 48 being opposite the first portion 47 and both portions 47 and 48 being substantially flat and of the same dimensions. The outlet opening 7 extends over a large part of the dimensions of each portion 47, 48, such that the screening element 8 prevents the ceramic powder exiting the hopper 5. When the hopper 5 is in an intermediate position I, illustrated in Figure 6, between the first filling position A and the second filling position B, the ceramic powder may drop to the conveyor belt 3 by the force of gravity through the opening 10 for forming the precursor layer of the decorating layer.

[0038] In an embodiment, not shown, instead of the frame 9 a pair of closing elements is provided, for example a pair of profiled sections, or of sheet metal, each closing element being arranged so as to extend below the outlet opening 7 to close the outlet opening 7 when the containing means 4 is respectively at the first filling position A or at the second filling position B.

[0039] In a further embodiment, which is also not shown, the screening element 8 is not present and the hopper 5 pours the loose ceramic material directly onto the flexible supporting means.

[0040] The containing means 4 further comprises a further hopper 11 arranged for pouring ceramic powder through an inlet opening 46 of the hopper 5, the further hopper 11 being provided below with a rotatable baffle 12 of known type, which is drivable by an actuator 13, which may be pneumatic. When the hopper 5 is in the first filling position A, or in the second filling position B, the rotatable baffle 12 is driven to enable the ceramic powder to reach the hopper 5 through the inlet opening 46.

[0041] With the further hopper 11 a mixer 14 is associated above with which the further hopper 11 is loaded with ceramic powders. The mixer 14 comprises a containing body 15, in the form of an upturned hollow taper with a vertical axis that is open at the bottom inside which a shaft is rotatable that is now shown that is drivable by a motor 16 for mixing ceramic powders of various colours contained therein. The mixer 14 comprises a cover 19 provided with a plurality of inlet ports 17 through which ceramic powders are loaded in the containing body 15 from a known supplying line, which is not shown.

[0042] Between the containing body 15 and the further hopper 11 a slidable baffle 30 is interposed that enables the containing body 15 to be closed and/or opened from the bottom.

[0043] As shown in Figures 9 to 11, the mixer 14 is movable with alternative motion substantially parallelly to the movement direction F1, F2, in a direction indicated by the arrows M1, M2, between a first stopping position C, shown in Figure 9, and a second stop position D, shown in Figure 11, driven by a further motor 18. In the first stop position C, or in the second stop position D, the mixer 14 receives the ceramic powders from the supplying line and the slidable baffle 30 maintains the containing body 15 closed below. In an intermediate motion position G, illustrated in Figure 10, during movement of the mixer 14 from the first stop position C to the second stop position D, or vice versa, the slidable baffle 30 opens the containing body 15 below and the ceramic powders are transferred by gravity to the further hopper 11.

[0044] Alternatively, the slidable baffle 30 can maintain the containing body 15 open whatever the position of the mixer 14.

[0045] when the containing means 4 is in one of the two filling positions A, or B, the mixer 14 supplies ceramic powders to the further hopper 11, moving from the first stop position C to the second stop position D, or vice versa, the further hopper 11 being maintained closed below by the rotatable baffle 12. Once the further hopper 11 has been loaded, the rotatable baffle 12 is driven and part of the ceramic powders contained in the further hopper 11 are transferred to the hopper 5.

[0046] As Figure 2 shows, the apparatus 1 further comprises further driving means 31 that enables a supporting structure 32 to be raised or lowered with respect to the conveyor belt 3. On the supporting structure 32 there are mounted the supporting means 20, the frame 24 and also the screening element 8, by means of members that are not shown.

[0047] The containing means 4 is thus movable in an auxiliary direction, indicated by the arrows S1 and S2 in Figure 2, between a raised position E, in which the containing means 4 is further from the belt 41 and a lowered position F, in which the containing means 4 is nearer the belt 41.

[0048] Being mounted on the supporting structure 32, also the screening element 8 is driven by the further driving means 31 to move along the auxiliary direction S1, S2, together with the containing means 4, maintaining itself interposed between the hopper 5 and the belt 41. The further driving means 31 is mounted on a base frame 53.

[0049] In the loading position of the carriage 26, the containing means 4 loads the grid 27 and the conveyor belt 3 with the ceramic powders in the manner disclosed below.

[0050] In the loading position of the apparatus 1, the containing means 4 is initially arranged, for example, in the first filling position A and the screening element 8 is

arranged in the raised position E. From the raised position E, shown in Figure 2, the screening element 8, together with the containing means 4, is lowered to the belt 41, as far as the lowered position F, shown in Figure 5, in which the screening element 8 is at a minimum distance from the belt 41, for example 3 mm.

[0051] In the lowered position F, the containing means 4 is driven by the driving means 20 to move along the direction T1 to the second filling position B. As shown in Figure 6, in any intermediate position I between the first filling position A and the second filling position B, the hopper 5 has the outlet opening 7 facing the opening 10 of the screening element 8. The ceramic powders contained in the hopper 5 drop through the force of gravity through the opening 10, occupying a region bounded laterally, at least in part, by the frame 9 and below by the belt 41. Walls 21 of the hopper 5 level the ceramic powders during movement of the hopper 5 between the two filling positions A and B. When the second filling position B, shown in Figure 7, is reached, the containing means 4 stops at the second portion 48 of frame 9 that prevents the exit of further ceramic powder from the hopper 5.

[0052] From the lowered position F, the supporting structure 32 is driven by the further driving means 31 to rise such that the screening element 8 reaches the raised position E, shown in Figure 8, in which the frame 9 no longer interacts with the ceramic powders and the precursor layer 49, having a plan dimension that is substantially the same as that of the plan dimension of the frame 9 and therefore of the forming cavity 2, is thus formed on the belt 41. In this position the screening element 8 is further from the belt 41 than the thickness of the precursor layer 49.

[0053] The conveyor belt 3 is then moved by the carriage 26 to the pressing position, being free to pass below the screening element 8 without interfering therewith.

[0054] Whilst the carriage 26 transfers the ceramic powders to the forming cavity 2, the containing means 4 is in a filling position, for example the second filling position B. In this position, the supplying line supplies powders to the mixer 14, which fills the further hopper 11, in the previously disclosed manner. Once the further hopper 11 has been supplied, the rotatable baffle 12 supplies the hopper 5.

[0055] When the carriage 26 returns the conveyor belt 3 to the filling position, the containing means 4 already contains the ceramic powders that are required for forming a new precursor layer on the belt 41.

[0056] Owing to the driving means 20, it is possible to arrange the ceramic powders of various colours on the belt 41 such that each colour extends prevalently along the motion direction of the containing means 4, i.e. of the hopper 5. This enables a decoration to be obtained in the decorating layer, and therefore on the front face of the produced ceramic tile comprising streaks, or elongated colour zones, or blotches, that reproduce the veining of marble, and in particular of travertine.

[0057] Further, it is possible to obtain a large-size tile,

i.e. a rectangular tile having a longitudinal dimension that is noticeably greater than a cross section, for example having a longer edge and a shorter edge in which the shorter edge is at least 60 cm, provided with longitudinal veining. In fact, the forming cavity for producing large-size tiles is generally arranged such that the longer edge of the tile to be formed is transverse to the movement direction of the carriage. With respect to known apparatuses, the containing means 4 arranges coloured ceramic powders on the belt 41 along a direction transverse to the movement direction of the carriage, thus creating streaks or veining or elongated zones of colour that are substantially parallel to the longer edge of the ceramic tile.

[0058] The veining obtained with the apparatus 1 is not traceable to an arrangement of slats of a loading grid of apparatuses of known type, inasmuch as such veining does not show clear but blurred contours.

[0059] Further, the coloured ceramic powders are transferred from the belt 41 to the forming cavity 2 without substantial alteration of the decoration obtained in the precursor layer.

[0060] Thus, by using the apparatus 1, the pattern that is obtained on the front face is substantially the same as that that would be obtained by polishing the surface of the ceramic tile according to known polishing techniques. It is thus possible to obtain a decoration on the front face of ceramic tiles without it being necessary to polish the surface of the tile.

[0061] As shown in Figure 15, a slab 54 of rectangular shape, which is obtainable by supplying a forming cavity of a ceramic press with the apparatus 1, has a front face that is provided with a decoration 55 obtained by pressing ceramic powders of various colours in a base body 56. The decoration 55 comprises zones of a colour 57 that extends substantially parallelly to a longer edge of the slab 54.

[0062] In Figure 18 there is shown a further slab 54' of rectangular shape, in which a decoration 55' formed by pressing coloured ceramic powders in a further base body 56' is obtainable by means of the apparatus 1. The decoration 55' comprises wave-shaped zones of a colour 57' the wave having a crest that extends in a direction substantially parallelly to a longer edge of the further slab 54'.

[0063] With reference to the Figure 17, elongated zones 58 of a colour in a certain ceramic tile, decorated by preparing the precursor layer 49 on the belt 41, are arranged in a different position from longitudinally corresponding zones of another ceramic tile produced for example subsequently to that certain ceramic tile.

[0064] The apparatus 1 thus enables a plurality of ceramic tiles to be obtained that are decorated successively, each tile of the plurality of ceramic tiles having a decoration that enables such a tile to be distinguished from other tiles of the plurality of ceramic tiles due to the different arrangement on the front face of the veining, or streaks, or zones of a colour.

[0065] The tiles of the plurality of tiles are not therefore repetitive inside a common decorative pattern, as occurred in ceramic tiles of the state of the art produced with a grid.

[0066] Compared with known apparatuses, it is not necessary to stop the apparatus 1 to diversify the decoration to be applied to ceramic tiles.

[0067] Naturally, if so desired, the apparatus 1 enables a decoration to be obtained that is substantially repeatable on the ceramic tiles produced. In fact, by suitably arranging the coloured ceramic powders inside the containing means 4, the containing means 4 can arrange a certain colour substantially in a same region of the belt 41, so as to obtain, for example, a streak of that colour having substantially the same dimensions and which extends substantially in the same position on the front face of ceramic tiles produced in sequence.

[0068] Figures 12 and 13 show an alternative embodiment 5' of the hopper 5.

[0069] Inside the hopper 5' there is provided projecting means 34, arranged for interacting with the ceramic powders contained in the hopper 5' to mix them at least partially.

[0070] The projecting means 34 comprises a plurality of elongated elements 50, fitted on a bar 35, inside the hopper 5', for example for example equidistant from one another like the teeth of a comb.

[0071] As shown in Figure 14, each elongated element 50 comprises a first part 60 parallel to the bar 35 to which it is connected by removable connecting means, such as screws; a second part 61 that is tilted in relation to the first part 60 so as to project inside the hopper 5'; a third part 62 parallel to the bar 35 and lastly a blade element 63.

[0072] The projecting means 34 may further comprise a plurality of further elongated elements 51, such further elongated elements 51 being arranged alternately to the elongated elements 50.

[0073] Each further elongated element 51 is shaped similarly to each elongated element 50, being provided with a respective second part that is shorter than the second part 61 of the elongated elements 50. Also the further elongated elements 51 can be equidistant from one another.

[0074] The bar 35 is connected to a sliding block 37 that is slidable inside a groove obtained in a longitudinal wall 36 of the hopper 5', the sliding block 37 being drivable by a cylinder 38, for example of pneumatic type. Alternatively, a driving system can be provided that is different from the cylinder 38, for example a motor.

[0075] The bar 35 is thus movable with alternative motion parallelly to the longitudinal wall 36 of the hopper 5', according to a direction indicated by the arrows G1 and G2 respectively in Figures 12 and 13.

[0076] As the hopper 5' is usually loaded with ceramic powders of various colours, for example arranged in layers inside the hopper 5', the projecting means 34 mixes the various colours of the ceramic powders with which they interact, creating discontinuity regions in the colour

layers.

[0077] This enables a ceramic tile with a main decoration to be obtained on the front face, for example provided with streaks, and zones that interrupt the decoration, in which the colours are partially mixed, these zones corresponding to the discontinuity regions produced by the projecting means 34 inside the hopper 5'.

[0078] The hopper 5' can be provided with a vibrating element 52 arranged for promoting the exit of the ceramic powders through the outlet opening 7 when the projecting means 34 moves inside the hopper 5'. In particular, two vibrating elements are provided that are fitted on a wall that is opposite the longitudinal wall 36.

[0079] In Figure 16 there is shown the front face of a ceramic tile of rectangular shape provided with a decoration 55" that is obtainable by means of the hopper 5'. The decoration 55" comprises zones of a colour 57" that extends parallelly to a longer edge of the front face and which form a main decoration. This main decoration is interrupted by blotches 59 of various colours that correspond to ceramic powders mixed inside the hopper 5' by the projecting means 34.

Claims

1. Apparatus comprising flexible supporting means (41), suitable for supporting loose ceramic material to be pressed, containing means (4) arranged for loading said flexible supporting means (41) with said loose ceramic material and further comprising movement means (26), such as to move said flexible supporting means (41) along a movement direction (F1, F2) between a loading position, in which said flexible supporting means (41) is nearer said containing means (4) and a pressing position, in which said flexible supporting means (41) is further from said containing means (4), said apparatus (1) further comprising driving means (20) such as to drive said containing means (4) along a direction transverse (T1, T2) to said movement direction (F1, F2).
2. Apparatus, according to claim 1, wherein said containing means (4) comprises an outlet opening (7) for distributing said loose ceramic material on said flexible supporting means (41).
3. Apparatus, according to claim 2, wherein between said outlet opening (7) and said flexible supporting means (41) there is interposed frame means (9), suitable for containing at least partially peripherally said loose ceramic material.
4. Apparatus, according to claim 3, wherein said frame means (9) comprises an opening (10) that is traversable by said loose ceramic material and arranged for defining a plan shape of a layer of said loose ceramic material on said flexible supporting means

- (41).
5. Apparatus, according to claim 3, or 4, wherein said frame means (9) is provided with a flat portion (47, 48) arranged for closing said outlet opening (7). 5
 6. Apparatus, according to claim 5, wherein said containing means (4) is movable along said transverse direction (T1, T2) between end positions (A, B) in which said outlet opening (7) is at said flat portion (47, 48), and intermediate positions (I) between said end positions (A, B), in which said outlet opening (7) faces said opening (10). 10
 7. Apparatus, according to any preceding claim, wherein said containing means (4) is movable along an auxiliary direction (S1, S2) substantially perpendicular to a flat region of said flexible supporting means (41) between a lowered position (F) in which said containing means (4) is nearer said flexible supporting means (41) and a raised position (E), in which said containing means (4) is further from said flexible supporting means (41). 15
20
 8. Apparatus according to claim 7 as appended to any one of claims 3 to 6, wherein also said frame means (9) is movable along said auxiliary direction (S1, S2). 25
 9. Apparatus according to claim 8, wherein said frame means (9) is mounted so as to move together with said containing means (4), when the latter moves along said auxiliary direction (S1, S2). 30
 10. Apparatus, according to any preceding claim, wherein said containing means (4) comprises first containing means (5) and second containing means (11), said second containing means (11) being arranged for supplying said first containing means (5) with said loose ceramic material. 35
 11. Apparatus, according to claim 10, wherein said second containing means (11) is provided with closing means (12) arranged for opening and/or closing said second containing means (11) so as to enable and/or prevent said loose ceramic material moving from said second containing means (11) to said first containing means (5). 40
45
 12. Apparatus, according to claim 10, or 11, wherein said containing means (4) further comprises third containing means (14) movable along a direction (M1, M2) parallel to said movement direction (F1, F2) to provide said second containing means (11) with loose ceramic material. 50
 13. Apparatus according to claim 12, wherein between said third containing means (14) and said second containing means (11) there is interposed closing 55
 - baffle means (30).
 14. Apparatus, according to any preceding claim, wherein said containing means (4) comprises mixing means (14; 34) arranged for mixing said loose ceramic material in said containing means (4).
 15. Apparatus, according to claim 14, wherein said mixing means (34) comprises projecting means (34), that projects from bar means (35) inside said containing means (4) said projecting means (34) being arranged for interacting with said loose ceramic material.
 16. Apparatus, according to claim 15, wherein said projecting means (34) comprises a plurality of elongated elements (50, 51), said elongated elements (50, 51) being equidistant from one another.
 17. Apparatus, according to claim 16, wherein said elongated elements of said plurality of elongated elements (50, 51) comprise a first element (51) shorter than a second element (50).
 18. Apparatus, according to claim 17, wherein each first element (51) is interposed between each second element (50), and vice versa.
 19. Apparatus, according to any one of claims 15 to 18, wherein said bar means (35) extends substantially parallel to a longitudinal wall (36) of said containing means (4).
 20. Apparatus, according to any one of claims 15 to 19, wherein said bar means (35) is movable along a shift direction (G1, G2) defined by a longitudinal extent of said containing means (4).
 21. Apparatus, according to claim 19, or 20 as appended to claim 19, wherein said bar means (35) is connected to sliding block means (37) that is slidable in groove means obtained in said longitudinal wall (36).
 22. Apparatus, according to claim 21, wherein said sliding block means (37) is drivable by actuating means (38).
 23. Apparatus according to any one of claims 14 to 22, as claim 14 is appended to any one of claims 10 to 13, wherein said mixing means (34) is provided in said first containing means (5).
 24. Apparatus, according to claim 15, wherein said bar means (35) is rotatable around an extent direction of said bar means (35), along which said bar means (35) extends.
 25. Apparatus, according to claim 24, as claim 14 is ap-

pended to claim 12 or 13, wherein said mixing means (34) is provided in said third containing means (14).

26. Apparatus, according to any preceding claim, wherein said flexible supporting means comprises a supporting surface (41) that is movable along a closed loop path. 5
27. Rectangular slab, comprising a decoration (55, 55') made of ceramic material pressed into a base body (56, 56'), said slab (54, 54') having a longer edge and a shorter edge having a length of at least 60 cm, said decoration (55, 55') being provided with zones (57, 57') of a colour distributed in said base body (56, 56') substantially parallelly to said longer edge. 10 15
28. Slab, according to claim 27, wherein a zone, or a group, of said zones (57, 57') is more extended in a direction transverse to said longer edge of a further zone, or of a further group, of said zones (57, 57'). 20
29. Slab, according to claim 27, or 28, wherein said zones (57, 57') are dispersed in further zones of a further colour and/or of said base body. 25
30. Plurality of slabs, each slab (54, 54') of said plurality of slabs being rectangular, comprising a decoration (55, 55') made of ceramic material pressed into a base body (56, 56') and having a longer edge and a shorter edge having a length of at least 60 cm, said decoration (55, 55') being provided with zones of a colour distributed in said base body (56, 56') substantially parallelly to said longer edge, **characterised in that** zones of a colour of a slab (54, 54') of said plurality of slabs are arranged in a different position compared with longitudinally corresponding zones of another slab of said plurality of slabs. 30 35
31. Plurality of slabs, according to claim 35, wherein said decoration (55, 55') is applied to said plurality of slabs with the same apparatus (1). 40

45

50

55

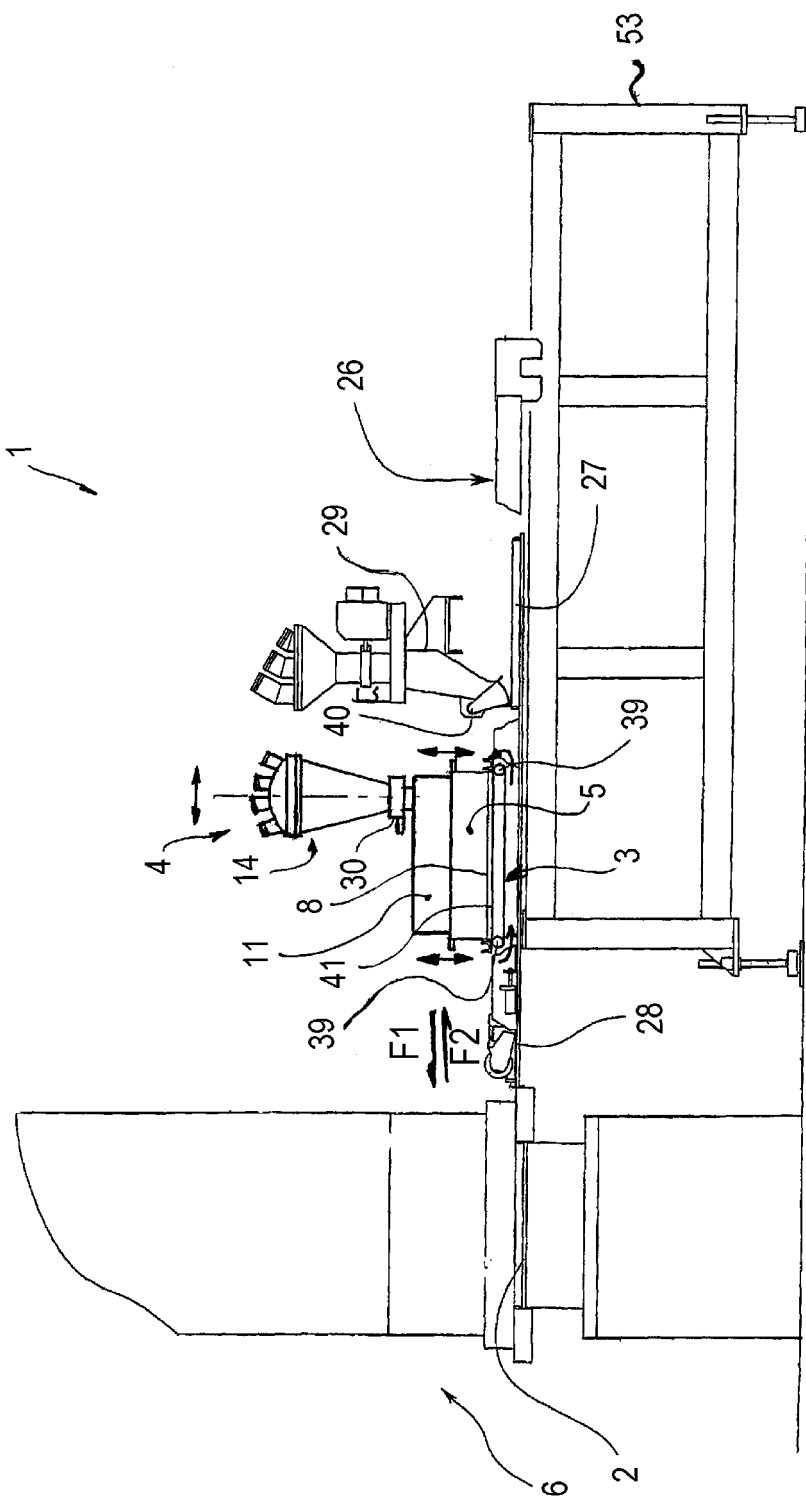


Fig. 1

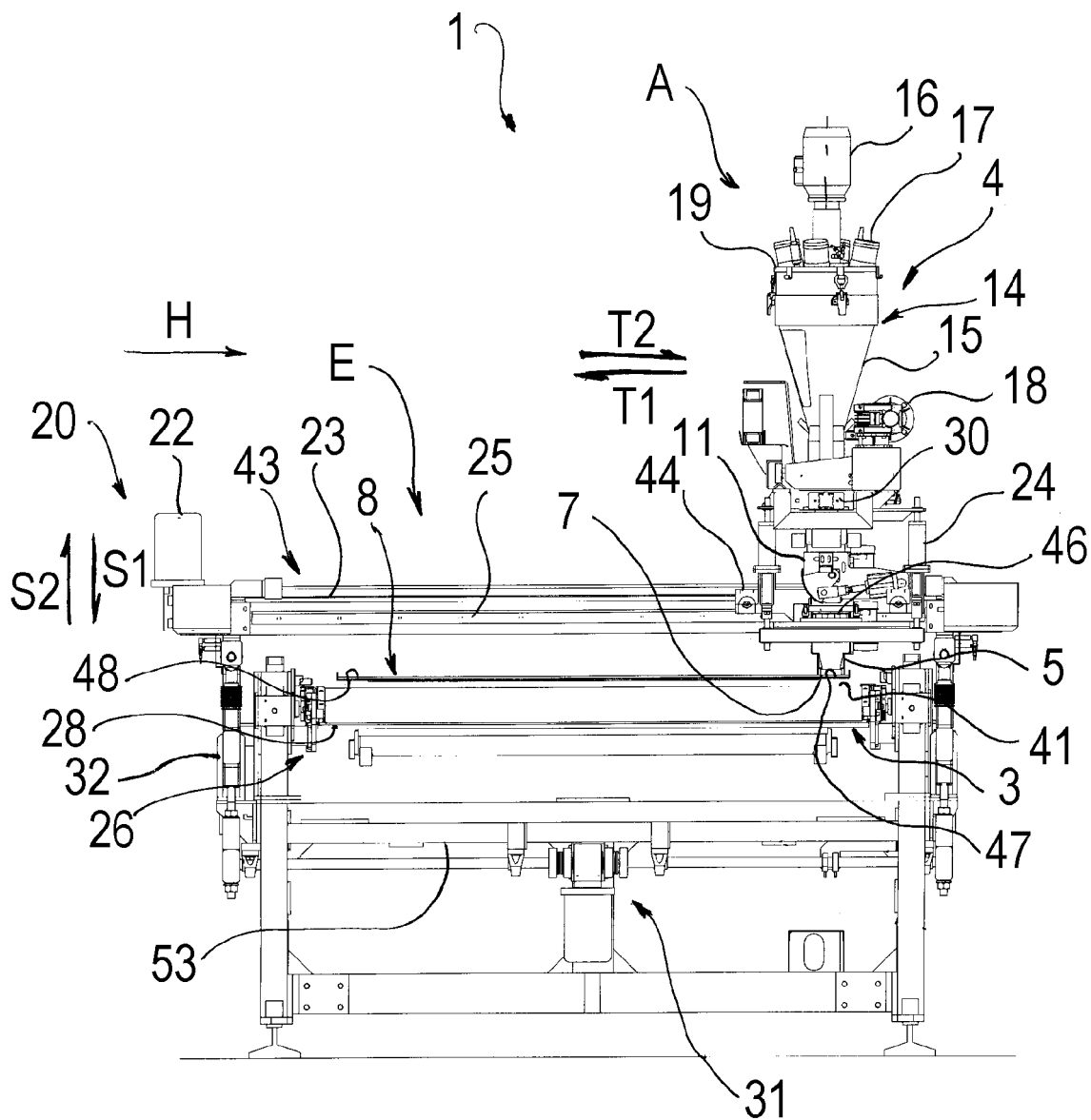


Fig. 2

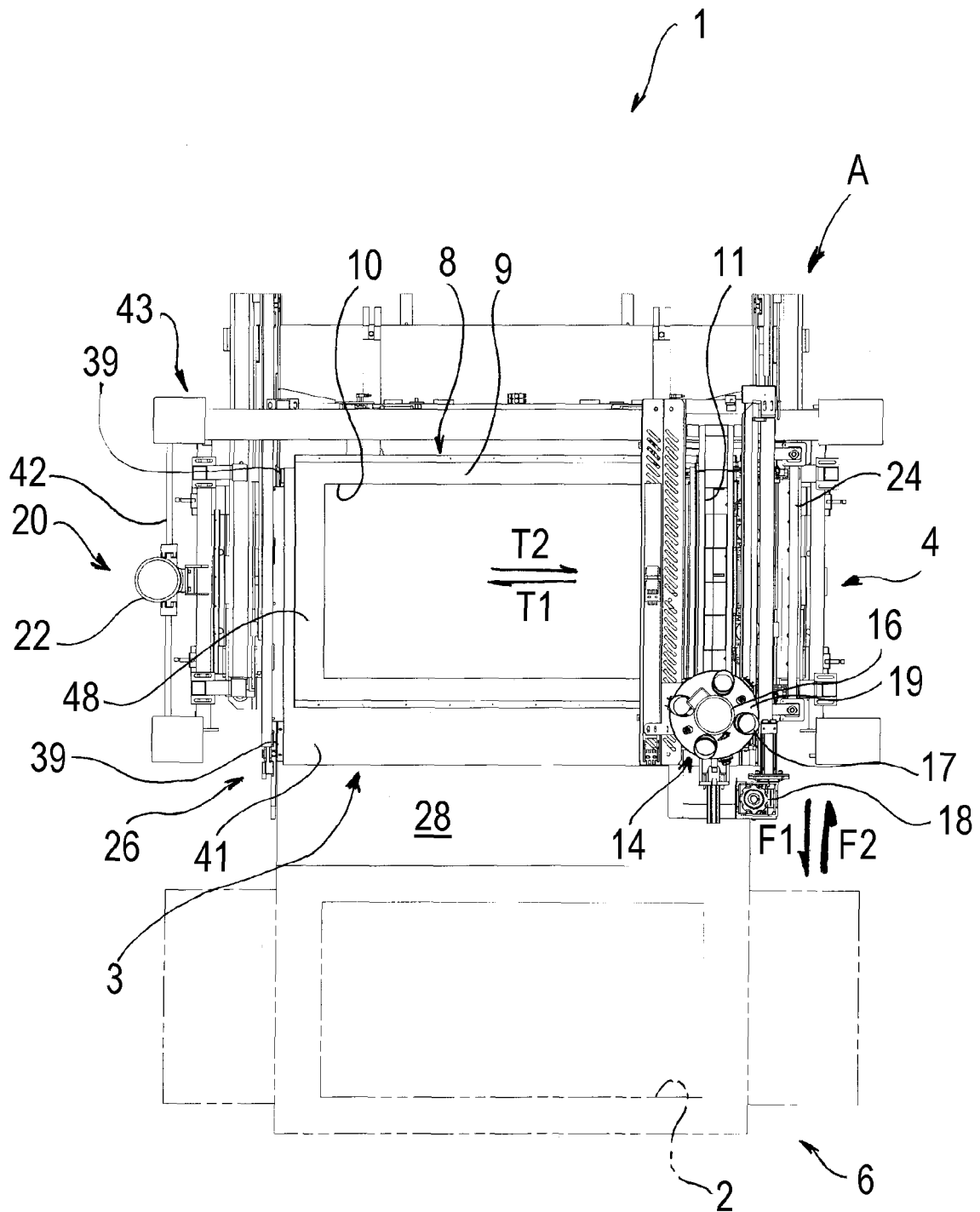
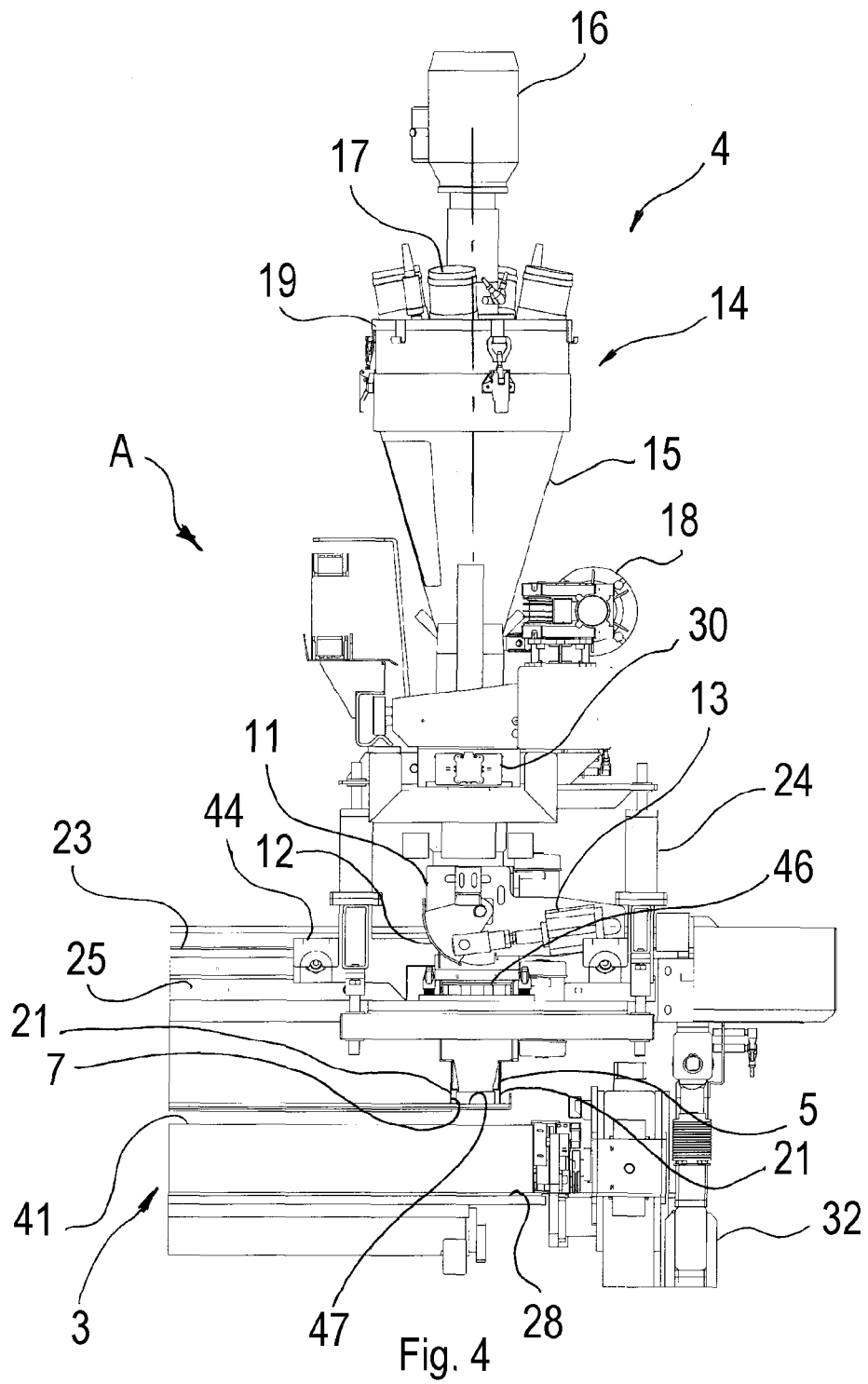
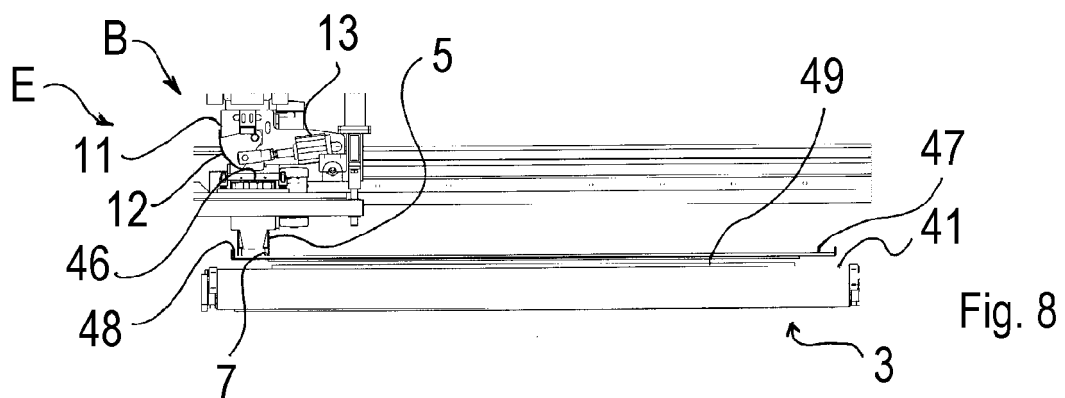
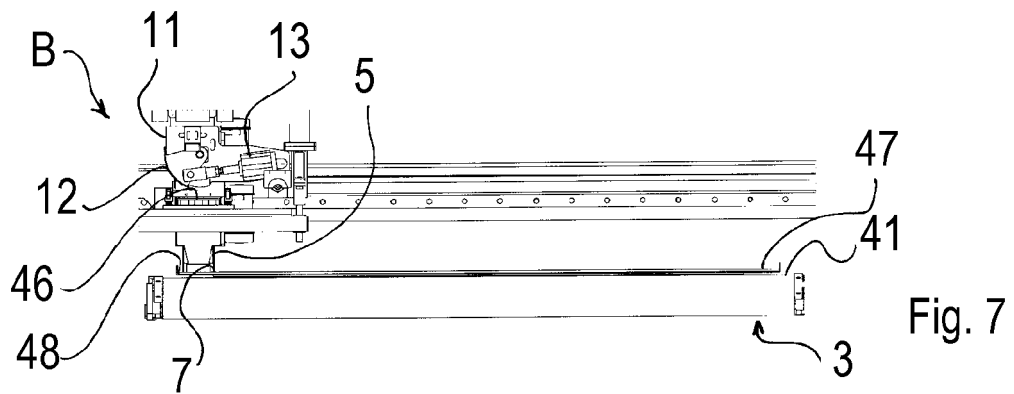
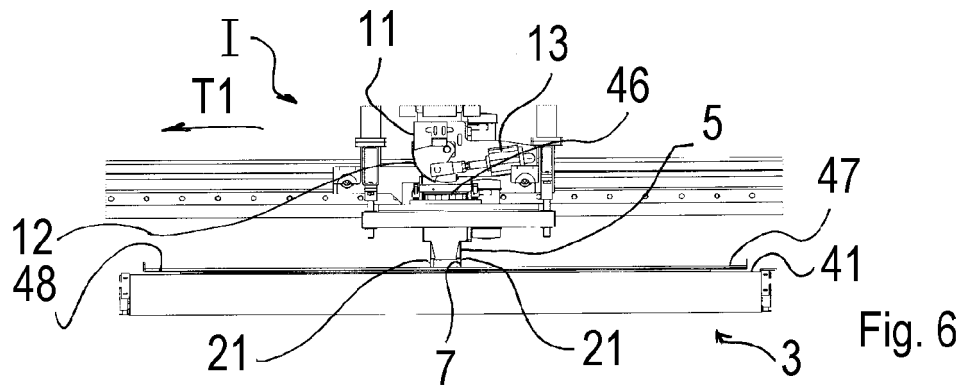
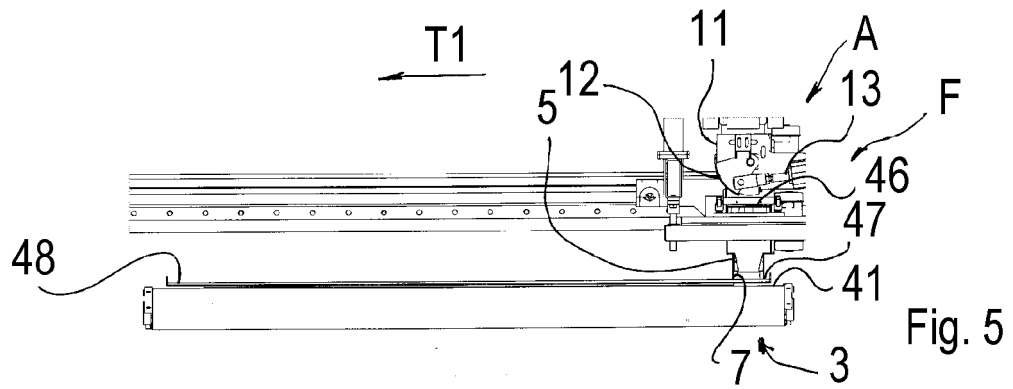
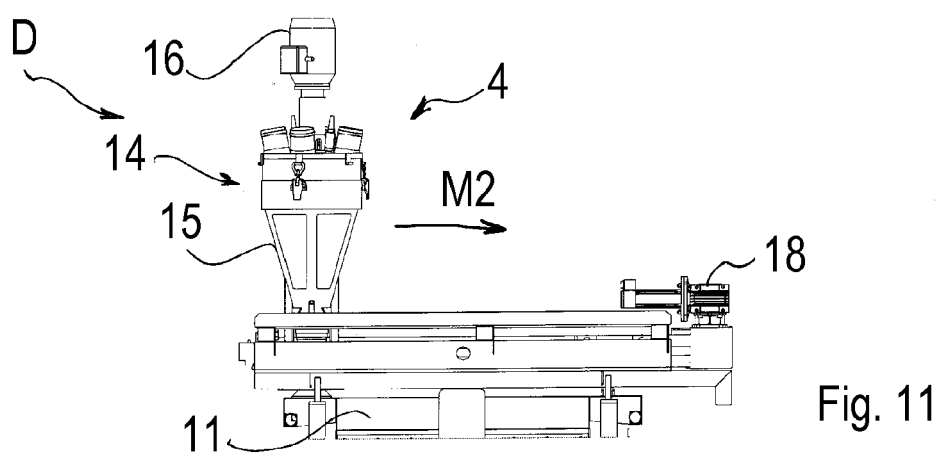
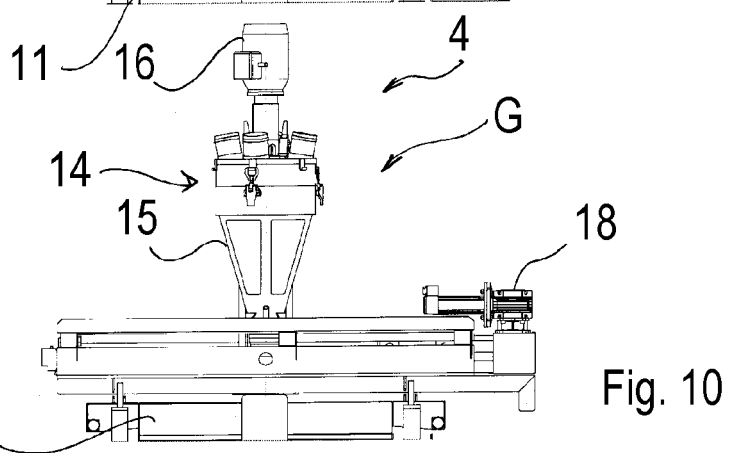
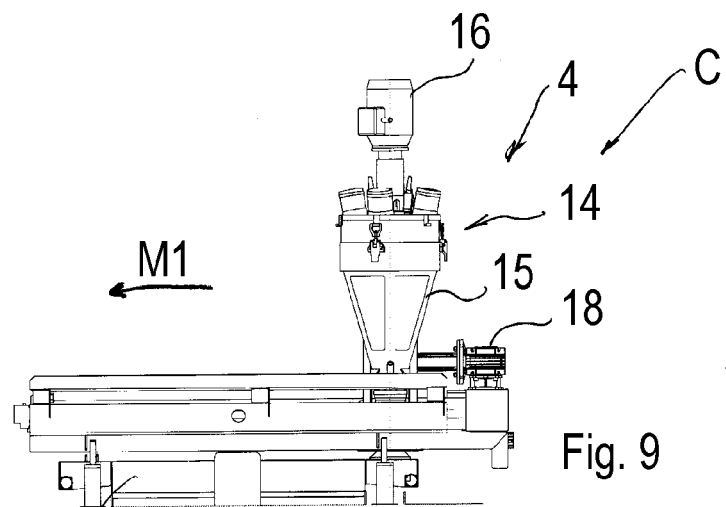


Fig. 3







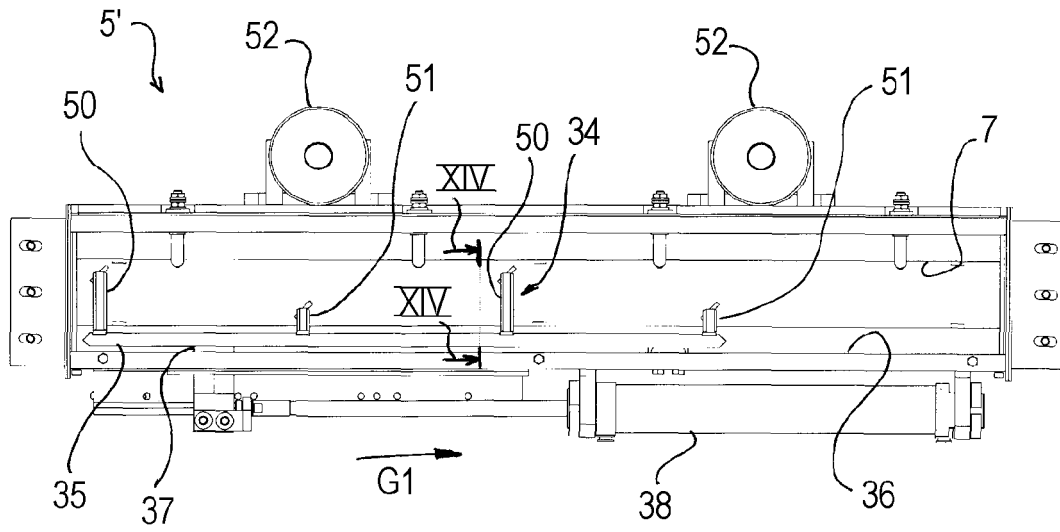


Fig. 12

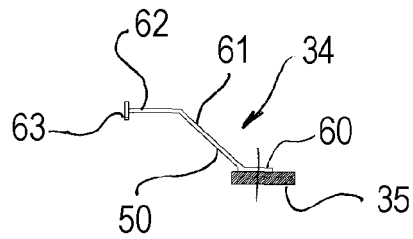


Fig. 14

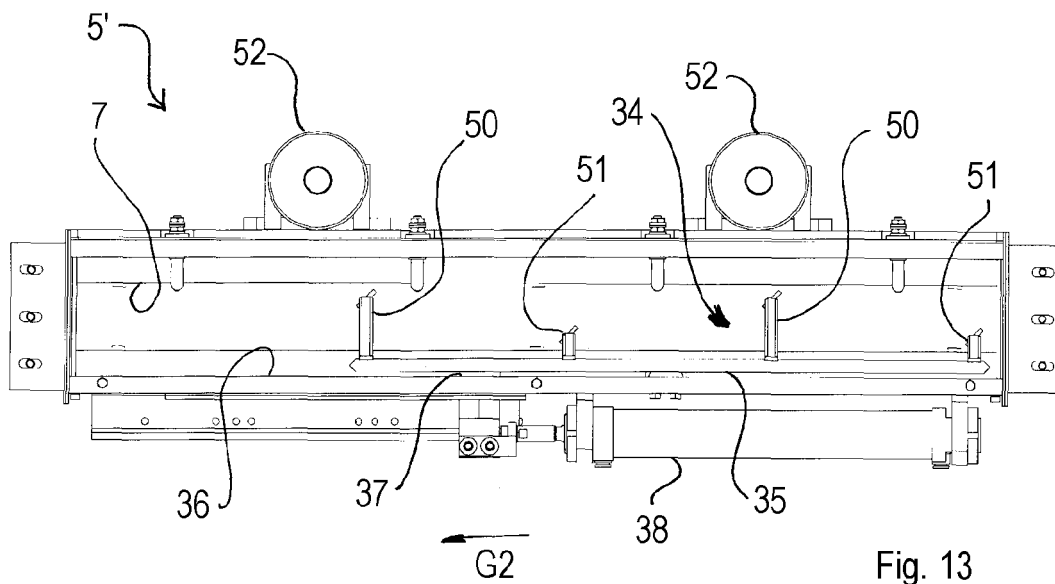


Fig. 13

