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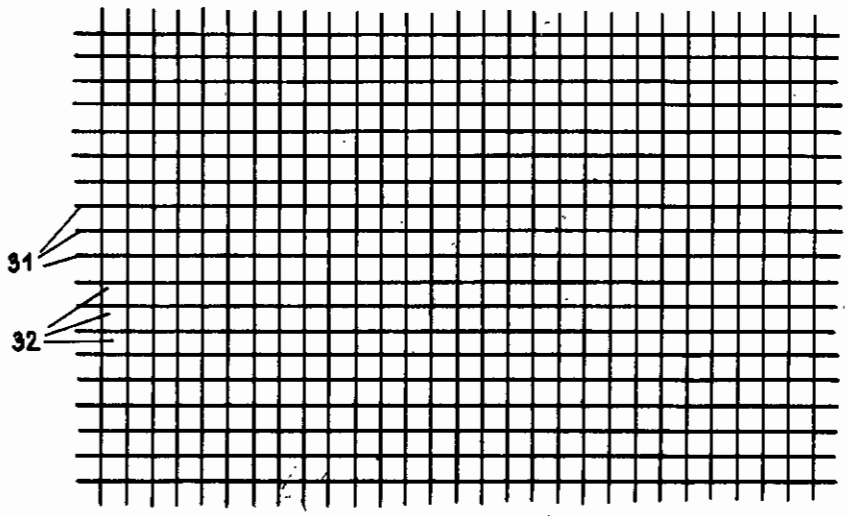
G. A. HASEKE
MANUFACTURE OF PLATES OF LARGE SUPERFICIAL AREA
Filed May 16, 1939

Serial No.
273,993
5 Sheets-Sheet 1

Fig.1



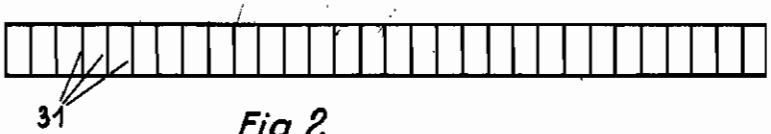


Fig.2

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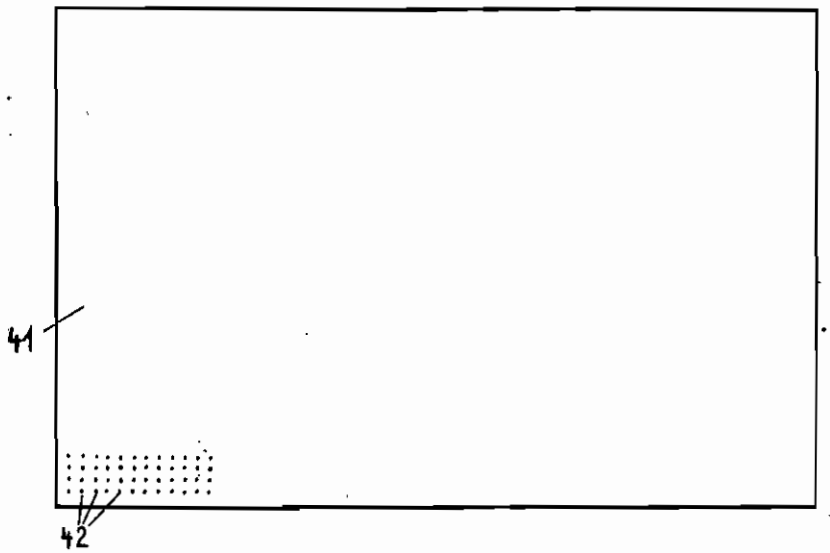
Fig.3



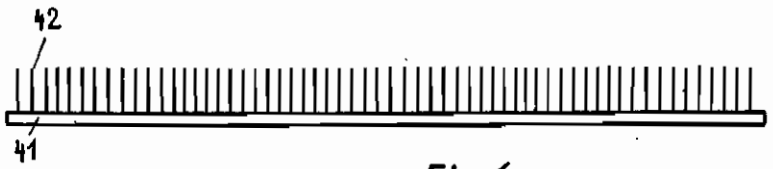


Fig.4

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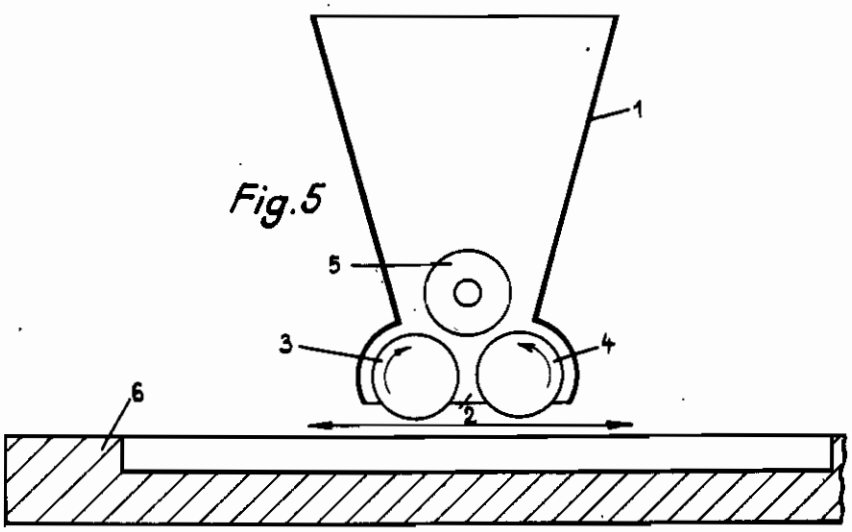

Fig.5

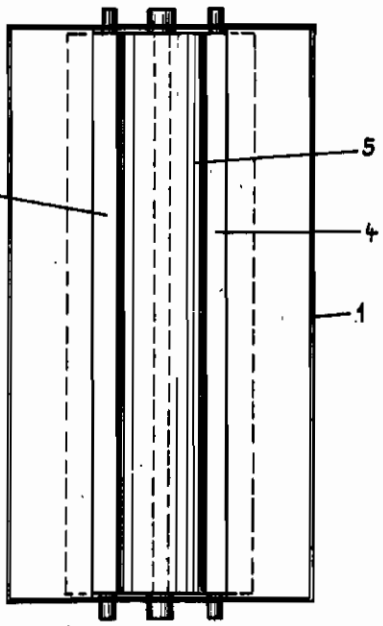

Fig.6

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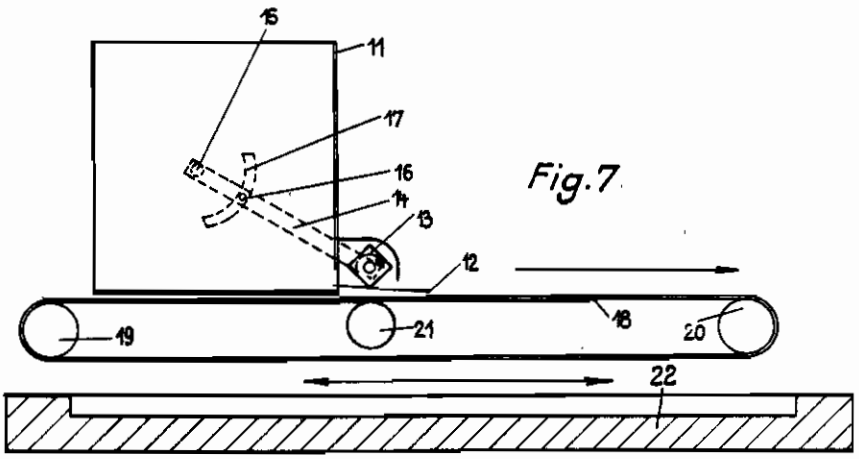

Fig.7

Fig.8

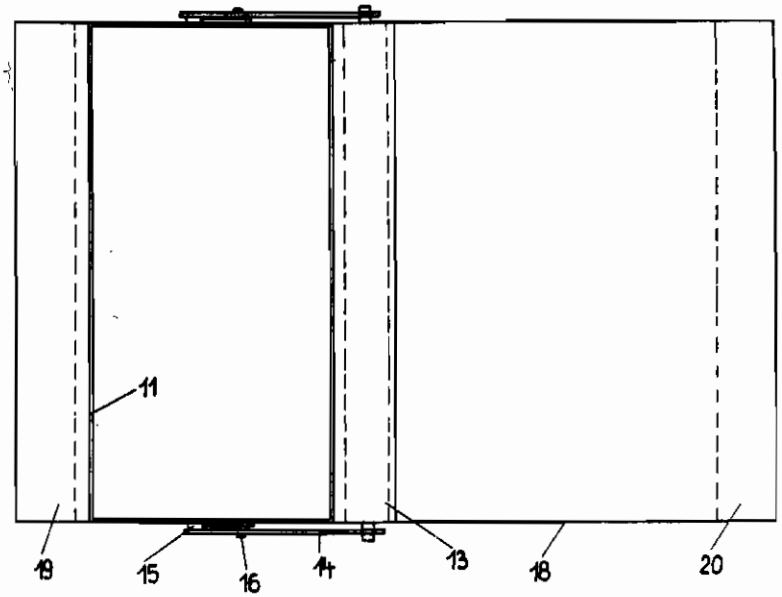

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Fig.9

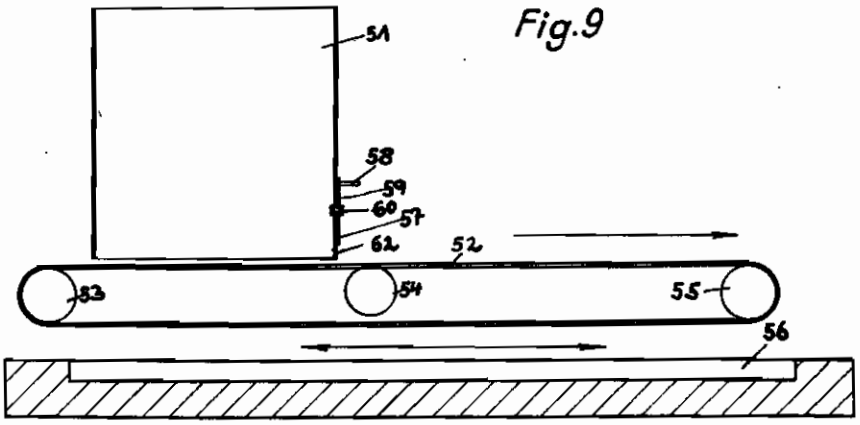
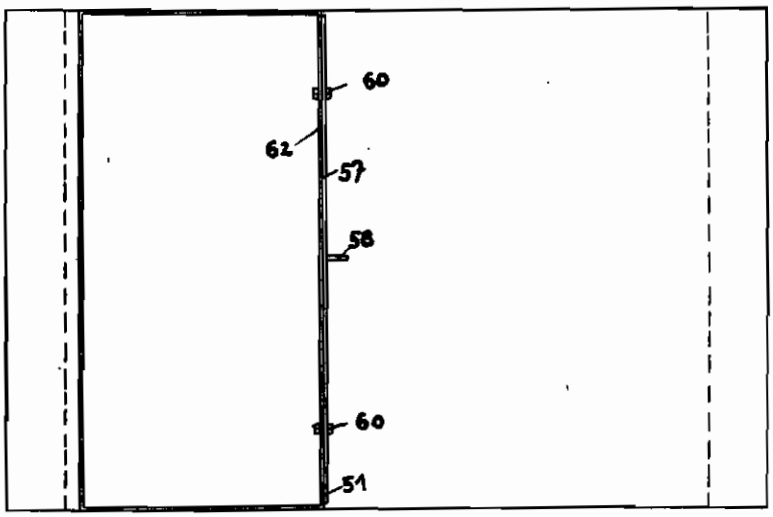


Fig.10



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ALIEN PROPERTY CUSTODIAN

MANUFACTURE OF PLATES OF LARGE SUPERFICIAL AREA

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Application filed May 16, 1939

This invention relates to a method of forming by pressing from small stuff plates of large superficial area, such as structural plates, doors, walls and the like, and to means and methods of uniformly distributing the material in the matrix of the press.

The invention may be applied with particular advantage when employing such materials as contain as the main constituent any substance of organic or inorganic nature in the form of chippings, shavings, fibres, grains, granules or powder, such as wood chippings, or shavings, wood meal, maize stalks or husks, coffeebean husks, asbestos and the like, and as binding agent adhesive substances such as casein, dextrine, bone glue, natural or artificial resins in the condensation or distillation stage.

In the pressing of large plates up to several square metres superficial area, it is relatively difficult to distribute the material to be pressed so uniformly in the matrix that the pressed article will be everywhere of the desired wall thickness, density and strength. If the distribution of the mixture poured into the matrix be effected by hand or by means of an ordinary hand-operated implement, this will take a relatively long time. Moreover, it is not possible in this way to obtain an even approximately uniform distribution. These disadvantages are overcome by the invention.

According to the invention the material to be pressed is, before the application of pressure, uniformly distributed in the matrix by means of a special distributing device or by a suitable construction of the charging arrangement. These means enable a very rapid and extremely uniform distribution of the material in the matrix to be effected. In consequence, the wall of the pressed article will everywhere be of the desired thickness and of uniform density and strength.

According to the invention the uniform distribution of the material in the matrix may be effected by means of a grid formed of vertical partitions, which is adapted to be inserted in the matrix. The grid may be made in one or more pieces and may consist of any material, for instance short metal or pressed material. The walls of the grid may be so high that, after the insertion of the grid in the matrix, they will reach to the edge of the matrix. The upper edges or lower edges of the grid partitions may, according to the form of the work to be pressed, lie in a plane surface or a wavy or otherwise shaped surface. The partitions of the grid may be so formed and interconnected that cells are formed having a round or cornered, for instance a square, cross-section.

For distributing the material in the matrix, according to the invention, the grid consisting of the vertical partitions is first placed in the matrix and thereupon the material is poured into the cells formed by the partitions of the grid and is strickled off smoothly over the individual cells. The grid is then withdrawn again from the matrix. The pressing operation may then commence. The matrix may, however, first be partially filled, the grid then placed in position and the cells of the grid filled up.

As a device for uniformly distributing the material to be pressed, a plate may also be used in accordance with the invention, the size of which corresponds approximately to the size of the matrix and which is provided on its under side with a large number of pins. The plate and the pins may be made of any sort of material, for instance of metal or of a pressed substance. The device may consist of one or more parts.

For effecting a uniform distribution of the material in the matrix the plate set with pins is, after the material has been poured into the matrix and been strickled smoothly on its surface, placed on the poured-in material in such a manner that the pins penetrate into the material. Thereupon the plate with respect to the matrix or the matrix with respect to the plate or the matrix and plate with respect to one another is moved to and fro in a horizontal plane in one or different directions. During this relative motion of plate and matrix the material to be pressed is, by means of the pins provided on the under side of plate, loosened up and distributed very uniformly within the matrix. After the plate has been lifted off the pressing operation may commence. The relative motion between plate and matrix may be produced by hand or by power.

Furthermore, according to the invention, for the distribution in the matrix of the material to be pressed, an arrangement may be used which consists substantially of a container for receiving the material to be pressed and having one or more discharge openings at its lower end, in which openings one or more rotary rollers are mounted. The roller or rollers may be of round or cornered cross-section. With advantage the roller or rollers are displaceable transversely to their axial direction, so that the space between adjacent rollers or between the rollers and the walls of the discharge opening is adjustable. By this means the rate of discharge and the

amount of discharge of the material to be pressed can be regulated within optional limits. Another possible way of regulating this rate and quantity of discharge is by making the speed of revolution of the rollers regulable. In order to cause the material which is to be pressed reaching the rollers in uniform distribution, a worm or other moving device is with advantage mounted above the rollers, for instance a roller provided with cams or other elevations or depressions or with arms, blades or buckets. Such a moving device may also serve for loosening the material and for breaking up any lumps in the material. With advantage, the device will be made displaceable with respect to the matrix or the matrix with respect to the device or both with respect to each other in such a manner that the discharge opening will travel over the entire surface of the matrix.

According to the invention an endless conveyer band or a plurality of endless conveyer bands may in addition be interposed between the discharge opening and the matrix. In this case the conveyer band or the conveyer bands may be made displaceable with respect to the matrix or the matrix with respect to the conveyer band or the conveyer bands or both with respect to one another, so that the whole of the matrix is swept over by the place of delivery of the conveyer band. Preferably the speed of travel of the conveyer band or of the conveyer bands is made regulable within optional limits. The speed of revolution of the roller or rollers, the speed of travel of the endless conveyer band or of the conveyer bands and the speed of the relative motion of the matrix and the material container or of the matrix and the conveyer bands are so adjusted that the material to be pressed will be poured on to the various places of the matrix in proportion to the desired wall thickness of the pressed body at such place.

As the device for distributing the material in the matrix a device may also be used in accordance with the invention which consists substantially of a container for the reception of the material with one or more discharge openings and an endless conveyer band or a plurality of endless conveyer bands arranged between the discharge openings of the container and the matrix.

With advantage, this device will be made displaceable with respect to the matrix or the matrix with respect to the device or both with respect to one another in such a manner that the discharge place of the conveyer band sweeps over the whole surface of the matrix. For this purpose the conveyer band or the conveyer bands can be made displaceable with respect to the matrix or the matrix with respect to the conveyer band or the conveyer bands or both with respect to one another. Preferably, the speed of travel of the conveyer band or of the conveyer bands is regulable within optional limits. The discharge opening of the box may be formed by the box being made without a bottom. The material to be pressed, which is poured from above into the box which is open at the top and bottom, will in this case bear directly on the conveyer band. For regulating the quantity of material emerging from the box, the box may be provided with an adjustable slide. When the box has no bottom the slide will preferably be arranged at that wall of the box which is the front one when viewed in the direction of motion of the conveyer band, and will be made vertically adjustable in such a manner that the material which is poured under the box on to the conveyer band is strickled off at the height desired in each case. Any other kind of device may, however, be used for regulating the quantity of material discharged.

Constructional examples of distributing devices according to the invention are illustrated in the accompanying drawings, in which:

Figure 1 is a plan view of a distributing device;

Figure 2 the front view of Figure 1;

Figure 3 a plan view of another distributing device;

Figure 4 the front view of Figure 3;

Figure 5 another distributing device in vertical longitudinal section;

Figure 6 the plan view of Figure 5;

Figure 7 a further distributing device in vertical longitudinal section;

Figure 8 the plan view of Figure 7;

Figure 9 a further distributing device in vertical longitudinal section, and

Figure 10 the plan view of Figure 9.

According to Figures 1 and 2, the distributing device consists of a grid made up of thin partitions 31. These partitions enclose small cells 32. The grid corresponds in its overall dimensions approximately to the size of the matrix. After the grid has been placed in the matrix the material to be pressed is poured into the cells 32 formed by the partitions 31 and is strickled off smoothly above the cells. The grid is thereupon lifted out of the matrix, after which the pressing operation may be carried out.

The distributing device according to Figures 3 and 4 consists of a plate 41 which is provided with pins 42 distributed uniformly over its surface. The plate 41 corresponds in its overall dimensions approximately to the size of the matrix. After the material to be pressed has been poured into the matrix and strickled off smoothly, the plate 41 is placed on the material in such a way that the pins 42 penetrate into the material. Thereupon the plate is moved to and fro in one or more directions with respect to the matrix or the matrix with respect to the plate or the matrix and plate with respect to one another, whereby the material is loosened up and distributed uniformly within the matrix. After the plate 41 has been lifted off the pressing operation may be carried out.

In the device according to Figures 5 and 6, a container 1 for the material to be pressed is provided, which is open at the top and is charged from above. At its lower end is the discharge opening 2. In this discharge opening are arranged two oppositely rotating rollers 3 and 4, the distance between which can be regulated. Above the rollers 3 and 4 is mounted a worm 5 which works in both directions, that is to say, is divided in the middle and operates from the middle towards both ends, and the distance of which from the rollers 3 and 4 is also adjustable. The speed of revolution of the rollers and the worm is regulable. The material to be pressed, which is poured from above into the container 1, arrives in its passage through the said container first of all on the worm 5, by which it is distributed to the two rollers 3 and 4. Between these rollers the material to be pressed is then discharged to the outside through the discharge opening 2. The container 1, together with the rollers and worms mounted in it, can be moved as a whole with respect to the matrix 6 in such a manner that the discharge opening 2 sweeps over the whole of the matrix.

In the constructional form shown in Figures 7 and 8, the container 11 for the material to be pressed is provided at its right-hand bottom corner (see Figure 7) with a discharge opening 12. In front of the discharge opening is mounted a roller 13 of square cross-section. The bearings of this rotatable roller 13 are engaged by a lever 14 which can be swung about a pivot 15 fixed on the container 11. In its swinging motion the lever 14 is guided by means of a pin 16 in a sickle-shaped groove 17 and can be fixed in this groove by means of a wing nut or in any other manner. Below the container 11 travels an endless conveyer band 18 which is guided over two end rollers 19, 20 and a guide roller 21. The material to be pressed is poured from above into the container 11. As it leaves the lower discharge opening 12 of the container it is uniformly distributed over the width of the conveyer band 18. By adjusting the roller 13 the rate of discharge of the material can be regulated within optional limits. The roller 13 at the same time serves the purpose of loosening up the material as it emerges, of breaking up any lumps which may have formed and of throwing back any excess of material leaving the container. This roller 13 can be mounted within the container, in front of or above the discharge opening and outside the container behind the discharge opening. The conveyer band 18 can be displaced together with the end rollers 19, 20 and the guide roller 21 above the matrix 22 in such a manner that the place of discharge of the conveyer band will sweep over the whole of the matrix. The conveyer band may be bounded on its sides by guide rails which prevent the conveyed material from falling off at the sides. By regulating the speed of revolution of the rollers 19 and 20 and of the roller 13, the rate and quantity of charge can be varied within optional limits.

In the constructional form shown in Figures 9 and 10, the container of the distributing device consists of a box 51 which is open at the top and the bottom and which therefore has neither a cover nor a bottom. The material to be pressed is poured from above into the box 51. The material passes through the box on to the endless conveyer band 52 which is guided over the rollers 53, 54 and 55. As the conveyer band reverses its direction around the roller 55, the material to be pressed is discharged into the matrix 56. The distributing device can be moved with respect to the matrix or the matrix with respect to the distributing device or both with respect to one another in such a manner that the discharge place of the conveyer band will sweep over the whole of the matrix. For regulating the amount of material conveyed by the conveyer band a slide 57 is provided at the front wall of the box, which slide can be raised and lowered by means of a handle 58. The slide 57 is provided with two guiding slots 59 through which the screws 60 on the box engage. After these screws have been released, the slide can be set to any height and be fixed by tightening the screws. By displacing the slide 57 in the vertical direction the opening 62 in the front wall of the box 51 can be uncovered to the extent desired in each case.

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