April 22, 1958 L. KLARMANN ET AL 2,831,213

FEEDING MOIST MASS CAKES TO PRESSES

Filed Nov. 12, 1953 2 Sheets-Sheet 1

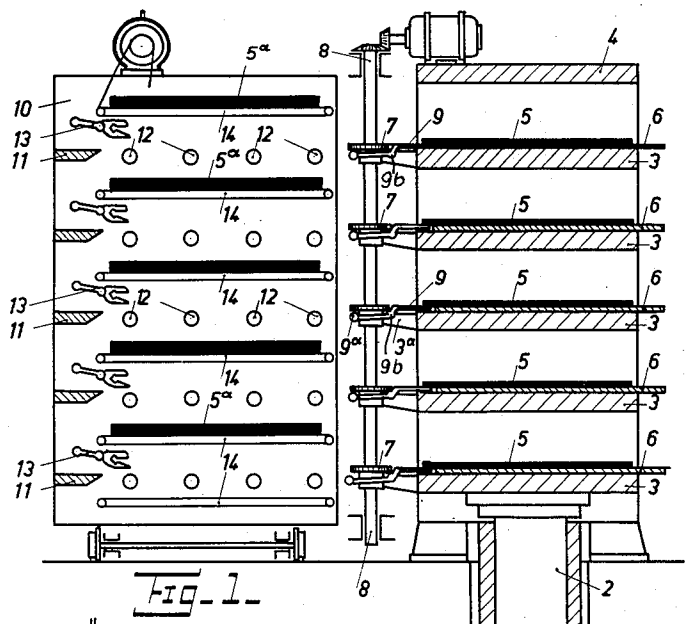



Fig. 1.

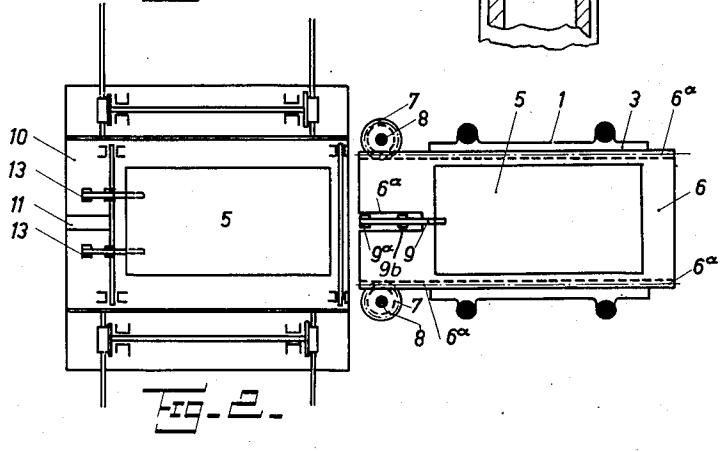



Fig. 2.

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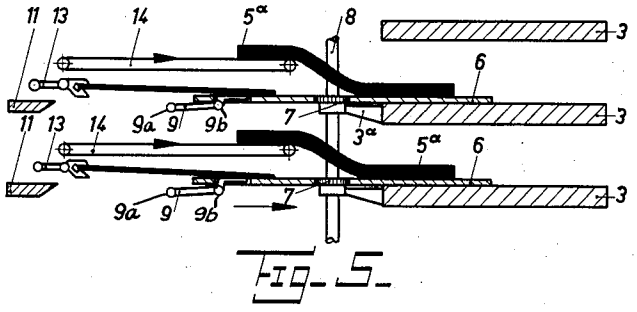



FIG. 5

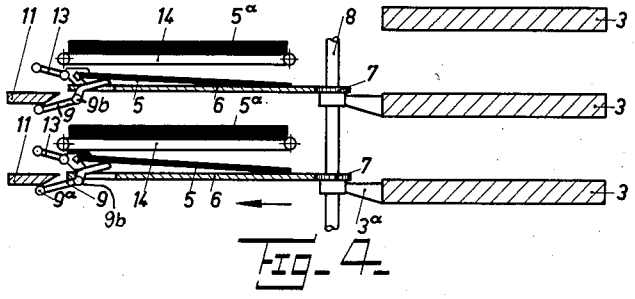



FIG. 4

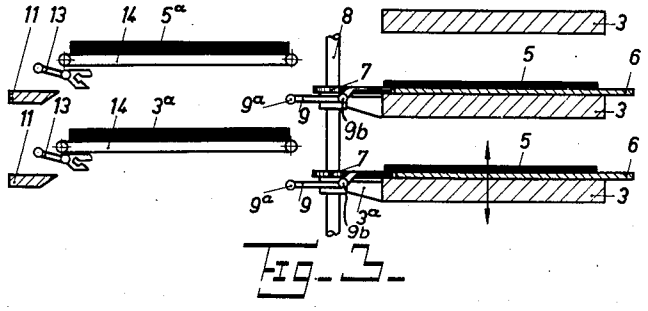



FIG. 3

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# FEEDING MOIST MASS CAKES TO PRESSES

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4 Claims. (Cl. 18—17)

This invention relates to a method and device for feeding moist mass cakes as used particularly for producing fiber plates to one- or multiple-storied plate presses.

Two fundamental methods are known for this purpose. In conformity with one of them the moist mass cake, without a supporting plate, is placed in the press by means of a conveyor arranged in front of the press on a level with the press plate to be charged. A rolled up screen placed before this lowermost plate is then unrolled and drawn over the plate while the cake fed at uniform speed by the conveyor is laid flat on the screen and drawn with it into the press. According to the other method, the cake is previously put on a supporting plate and pushed with the latter into the press by suitable means. After the pressing operation the cake is drawn out by gripping tongs, usually on the side of the press opposed to the charging side.

With respect to the first method experience has shown that screens, due to bulging and waviness, cause frequent operating troubles, and their rapid wear involves high cost of upkeep. The second method, which for these reasons is preferred at present, requires, however, an extensive returning arrangement for the emptied charging plates having a size up to 10 $m^2$ and a maximum weight of about 400 kg. This necessitates the provision of a special conveying plant using trucks or a traveling crane and also the installation of transversely operating means for pushing the plates into the supply path of the cakes.

It is the object of the invention to propose a novel method and device for the purpose stated, whereby the disadvantages connected with the two methods mentioned are overcome.

The method according to the invention consists in moving the cake supporting plates from their position in front of the press toward the latter and back again on the same way, while the moist cakes are kept in readiness for deposition on the supporting plates on belt conveyors. These conveyors are movable in the direction of the press, arranged slightly above the plane of motion of the supporting plates and during the introduction of these plates are driven at the same speed to facilitate the transfer of cakes to them.

The finished cakes moved out of the press during the return of the supporting plates, on reaching their end position, are caught by gripperlike holding means at their front edge and thus prevented from being carried along again when the supporting plates reenter the press. The finished cakes, shortly before their end position, are slightly lifted at their front edge so as to rest on the plate in inclined position and with their rear edge only to reduce friction. The cakes are then released and drop on the conveyor belt which carries them out of this intermediate position.

A feature of the device according to the invention is that both longitudinal sides of the supporting plates of the press are toothed and are moved to and fro by two vertical driving shafts laterally disposed at the front of the press and provided with pinions. In a transversely movable charging frame positioned in front of the press lateral roller paths are arranged, and above them at a relatively short distance therefrom horizontal endless conveyor belts are positioned which, synchronously driven with the returning supporting plates, deposit fresh mass cakes thereon.



In a preferred form of construction the front edge of the supporting plates has recessed portions for the reception of double levers which with their rear end engage from below the front edge of the pressed cakes and at their outward movement meet a stop and are thereby turned upwards so that they introduce the edge of the cake held by them into gripping tongs or the like arranged slightly above the stop and under the conveying band. The upwardly and downwardly displaceable press plates possess arms for actuating the pinions in both directions on the two shafts with which they remain rotatably coupled by means of projections engaging longitudinal grooves of the shafts. Below the lowest press plate an endless conveyor is also provided which serves for intercepting the lowermost pressed cake released by the gripping means and carrying it out of the frame. All gripping means are closed and opened by a common control.

One embodiment of the invention is diagrammatically illustrated in the accompanying drawings, wherein

Figure 1 is an elevation of the device;

Fig. 2, a top view thereof; and

Figs. 3, 4 and 5 show details of the charging and discharging operations.

The press 1 comprises the press plates 3 vertically movable by the plunger 2 and pressed against the stationary head plate 4 to drive the moisture out of the mass cakes 5 each of which rests on a supporting plate 6. The plates 6 are provided on their longitudinal edges with teeth 6*a* in engagement with pinions 7 loosely displaceable on vertical shafts 8 on the front side of the press and rotatably coupled therewith by projections engaging longitudinal grooves of the shafts. The pinions 7 are displaced upwards and downwards by arms 3*a* on the front side of the press plates 3 and cannot become disengaged from the teeth 6*a* regardless of their level. In a recess of each supporting plate 6*a* lever 9 is provided which with its rear end engages from below the front edge of the pressed cake 5 while the other end 9*a* is so rounded off that it slightly lifts this edge when urged downwardly by stops 11 located on the same plane on the charging frame 10. On the side walls of the frame 10 roller paths 12 are arranged on a level permitting them to support the edges of the plates 6. Above the stops 11 gripper tongs 13 are provided into which the raised edges of the finished cakes 5 are introduced. By a common control arrangement (not shown) all tongs 13 are simultaneously closed and reopened. Their action prevents the pressed cakes 5 from being carried along by the returning supporting plates 6 which, as it were, are pulled away from under them. Slightly above the roller paths 12 and the gripping tongs 13 conveyor bands 14 are provided and can be synchronously moved in the direction of the supporting plates 6 towards the press, so that the moist cakes 5*a* previously placed on the bands 14 may be carefully delivered to the returning supporting plates 6. The charging frame 10 with all its parts runs on a track like a vehicle and can thus serve for receiving mass cakes 5*a* at their point of production as well as delivering finished cakes at the proper place.

Fig. 3 shows how moist cakes 5*a* are kept on the conveyor bands 14 of the charging frame 10 and the finished cakes 5 in the reopened press are ready for being moved out.

Fig. 4 shows how the moved out supporting plates 6 on the roller paths 12 in the charging frame 10 deliver

a finished cake **5** to the grippers **13**; as only the rear edge of the cake touches the supporting plate **6**, there is little friction.

Fig. 5 shows how a moist cake *5a* is transferred from the conveyor band **14** to a supporting plate **6** returning to the press while the finished cake **5**, held in the meantime by gripper tongs **13** in a somewhat inclined position, is released and drops between the roller paths **12** on the next coneyor band **14**.

We claim:

1. A device for feeding moist cakes to a press and withdrawing processed cakes therefrom, the press having a plurality of press plates for processing the cakes, a stationary head plate arranged above said press plates, a plurality of supporting plates being arranged in one position thereof on said press plates, and means for pressing said press plates and the supporting plates against said stationary head plate so that moist cakes supported by said supporting plates are converted into processed cakes; said device comprising first means on said supporting plates for raising said processed cakes at one edge thereof, means for transporting said supporting plates and said first means into a position displaced from said press plates and said stationary head plate, second means for gripping said processed cakes when said cakes are raised at their edges and with said supporting plates displaced, and supply means for holding additional moist cakes above the displaced supporting plates, said transporting means being operative to return said supporting plates to said one position whereby the gripped cakes are



removed, said supply means depositing said additional moist cakes on the returning supporting plates, said first means being levers swingable in recesses defined in said supporting plates, comprising stationary members engaging said levers in the displaced position of said supporting members so as to raise said cakes from said supporting members and to bring said cakes into a position in which they are gripped by said second means, said device further comprising racks on said supporting plates, said transporting means including pinions meshing with said racks.

2. A device as claimed in claim 1, said means for holding the additional cakes being conveyor belts arranged between said second means and said press plates.

3. A device as claimed in claim 2, comprising a vertical shaft supporting said pinions, and arms on said press plates engaging said pinions to locate the same on said vertical shaft.

4. A device as claimed in claim 3, comprising a common control means for simultaneously opening and closing said second gripping means.

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