July 18, 1939. P. R. SIMMONS 2,166,268

APPARATUS FOR FORMING COATED PAPER PLATES

Original Filed March 16, 1936 3 Sheets-Sheet 1

FIG. 1

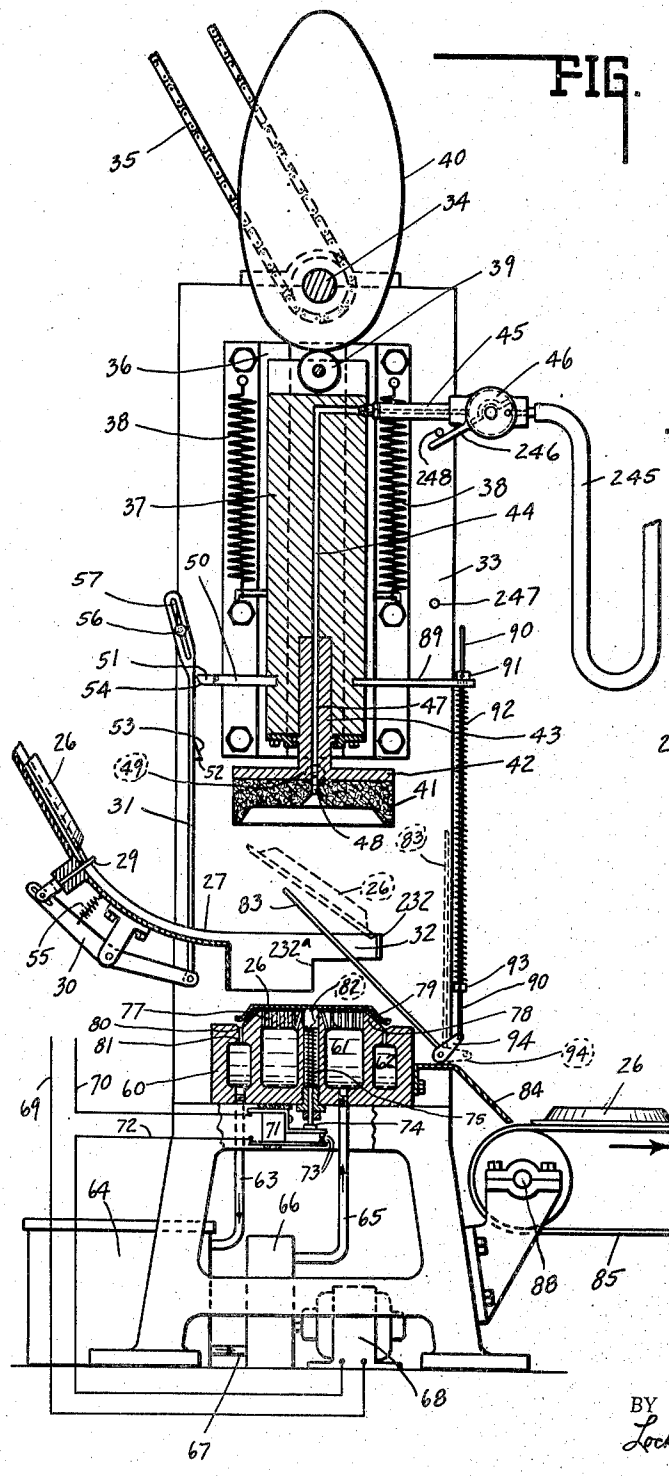
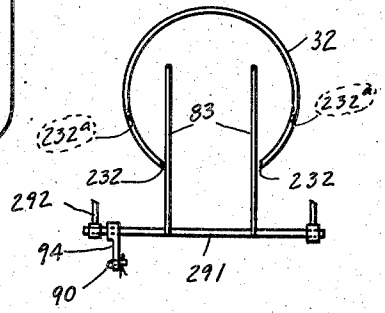
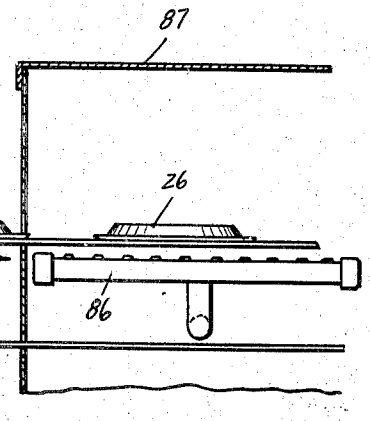


FIG. 3





INVENTOR.
PAUL R. SIMMONS.

BY
Lockwood Goldsmith & Galt
ATTORNEYS.

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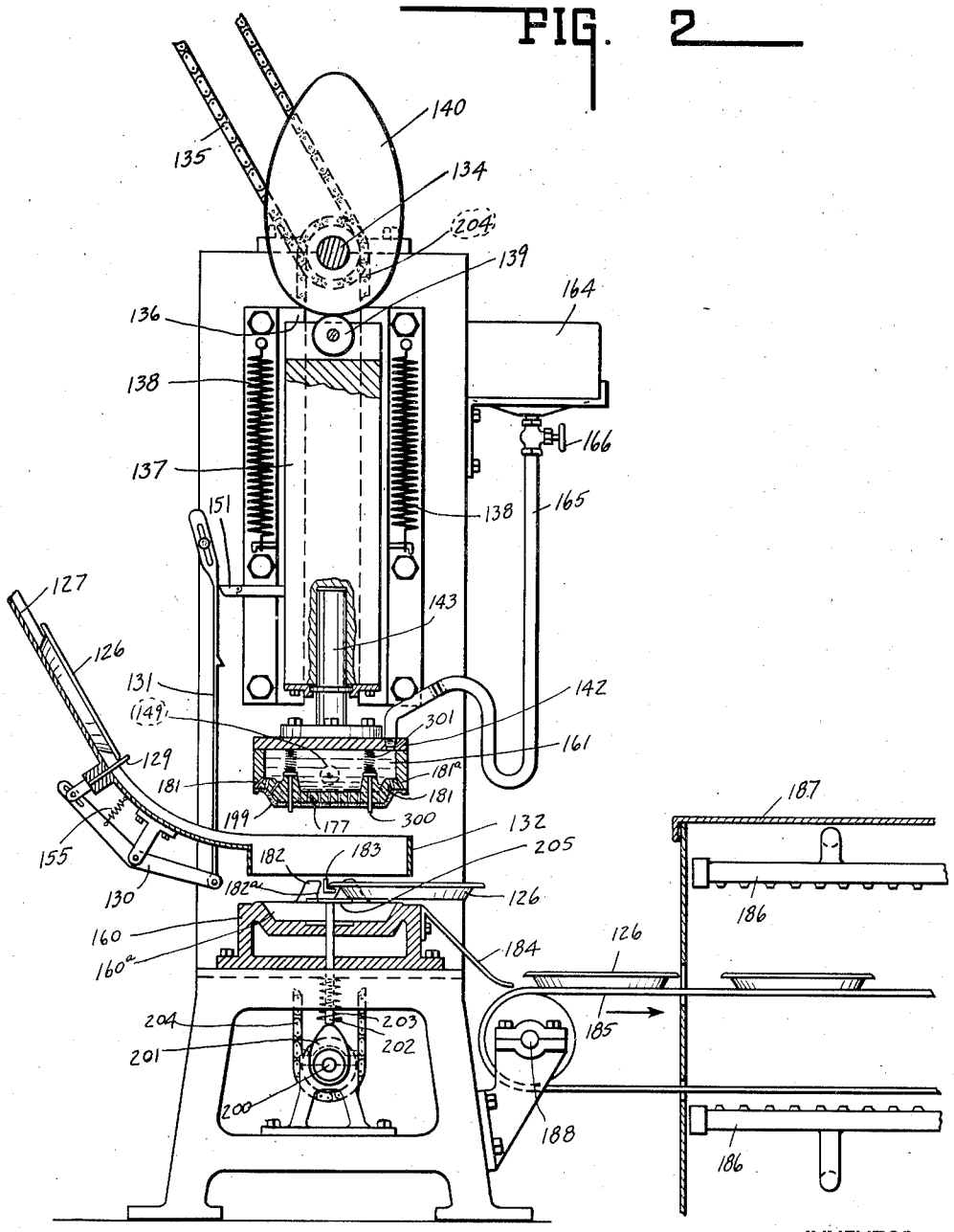
APPARATUS FOR FORMING COATED PAPER PLATES

Original Filed March 16, 1936 3 Sheets-Sheet 2

FIG. 2



INVENTOR.
PAUL R. SIMMONS.

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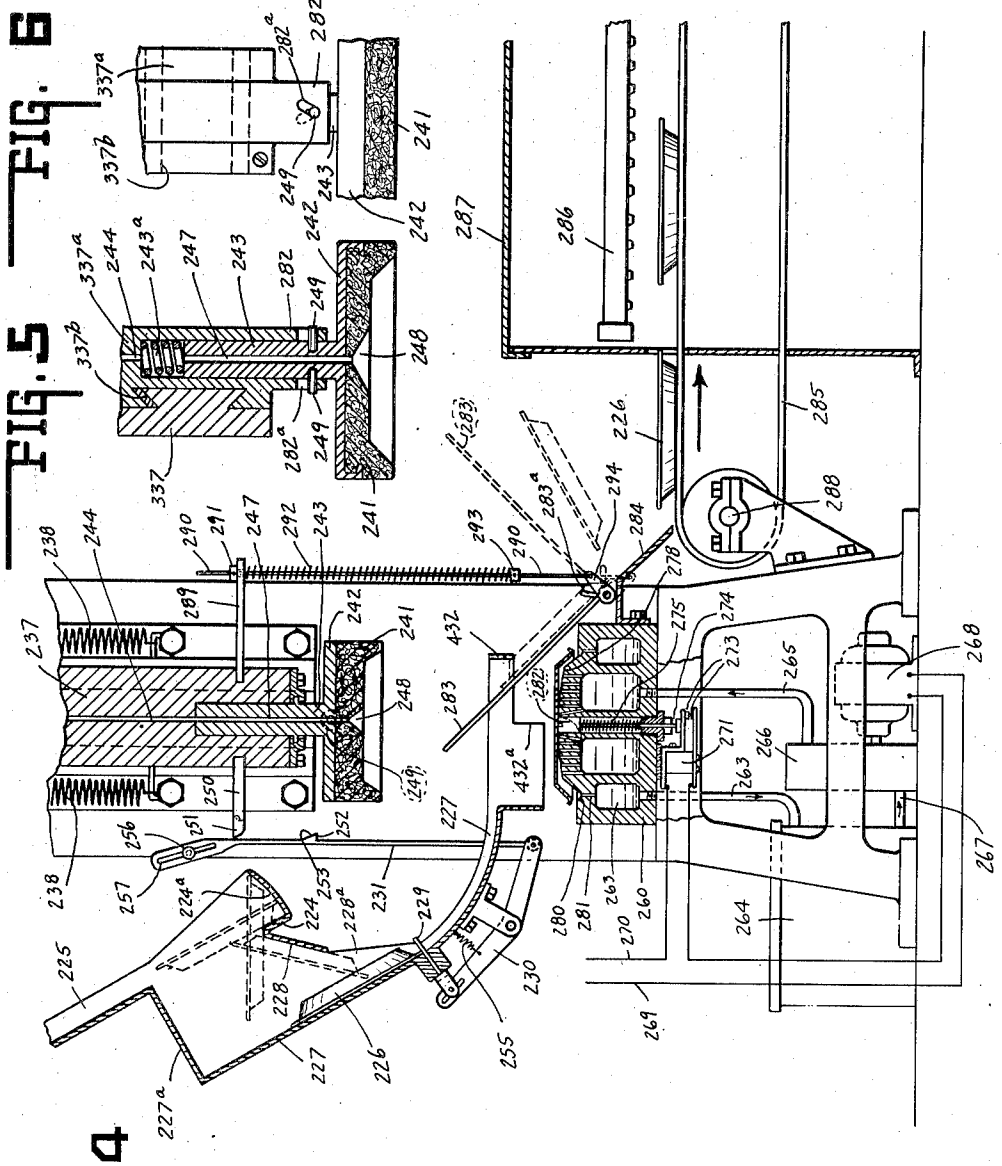
Original Filed March 16, 1936 3 Sheets-Sheet 3

FIG. 6

FIG. 5

FIG. 4



INVENTOR.
PAUL R. SIMMONS.

BY
Lockwood Goldsmith & Galt
ATTORNEYS.

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UNITED STATES PATENT OFFICE

2,166,268

APPARATUS FOR FORMING COATED PAPER PLATES

Paul R. Simmons, Logansport, Ind., assignor to Purity Paper Products, Inc., a corporation of Indiana

Application March 16, 1936, Serial No. 69,063
Renewed December 3, 1938

20 Claims. (Cl. 91—47)

The present invention relates to an apparatus for the expeditious coating of the inner surfaces of paper dishes, such as paper pie plates, or the like, on a quantity production basis, whereby such coated plates may be used for receiving ingredients, in unbaked form for the baking of pies, and inserted in ovens for baking the pies. The coating material or medium utilized prevents discoloration of the plates as well as prevents contamination of the pies or other food products cooked in such plates. Furthermore, the plates may be used for cooking purposes without loss of shape, and in most cases acquiring additional rigidity. The coated plates are relatively non-absorbent with respect to fruit and vegetable juices as well as liquids with a water base, and also are unaffected by shortening necessary for pie crusts.

The particular medium used for coating the pie plate is fully disclosed in the copending application Serial No. 39,730, filed September 9, 1935, entitled "Baking paper plate and process of forming same".

The invention contemplates an apparatus for coating paper products, such as paper pie plates or the like, on a production basis, wherein the coating medium is applied to such portions of the dishes or plates as receive food or other commodities, and is herein described and illustrated as an apparatus for coating the inner surfaces of paper plates to be used for the baking of pies.

The coating medium is applied to the inner or interior surfaces of the plates in liquid form. It is relatively light yellow in color and is applied to the surfaces of the plates at a plurality of localized areas, and then by means of relative rotative movement between the applicator and a plate, usually by rotating the plate, the entire plate surface exposed to the medium is completely covered with the medium. After the plates have been coated, they are removed to tempering station in timed relation with the coating apparatus, and when tempered may be stored for indefinite periods or made immediately useful for baking purposes.

The tempering accomplishes two results:—first, it dries the liquid so the plates may, without sticking together, be stacked for storage or shipment, and secondly, and more especially, it sets the coating so that it is relatively resistant as respects subsequent absorption of grease and juices of the pie ingredients when a plate is used for baking.

In the present disclosure, there are represented two different forms of applicators. In one form, the medium is applied in an upward direction to the interior surface of an inverted plate and in the other form, the medium is applied in a downward direction to the upwardly directed interior surface of the plate when normally positioned. In both instances, however, the plate or applicator is subjected to a rotary motion for the purpose previously set forth.

The full nature of the invention will be more fully understood from the accompanying drawings and the following description and claims:

Fig. 1 is a longitudinal sectional view of an applicator apparatus suitable for applying the coating medium in an upward direction to an inverted plate, mechanism controlling the plate supply thereto, and the plate removal therefrom as well as the drying and conditioning apparatus associated with the coated plate.

Fig. 2 is a similar view of a modified form of the apparatus for coating in a downward direction against the plate in right-side-up position;

Fig. 3 is a top plan view of the plate guide and transfer device of Fig. 1;

Fig. 4 is a view similar to Fig. 2, of a modified form of the invention;

Fig. 5 is a central sectional view through a rotatable and reciprocable plate pressing head;

Fig. 6 is a side elevation of a portion of the head of Fig. 5.

In order to carry out the coating of paper pie plates, and the like, on a production basis, with the apparatus of the present invention, a supply of plates must be furnished. These plates may come directly to the applicator from the plate forming machine or may come from a supply of plates as conditions warrant.

A representative type of pie plate producing machine appears in Simmons Patent No. 1,273,009, issued July 16, 1918, and also in Simmons Patents No. 1,004,931, issued November 19, 1912, and No. 1,147,759, issued July 27, 1915.

Where the applicator of the present invention is used in conjunction with such pie plate forming machine, the plates as successively produced on the plate forming machine may be arranged to travel therefrom to the applicator along an inclined guideway, such as the guideway 27 shown in Fig. 1, the guideway 127 of Fig. 2, and the guideway 225 shown in Fig. 4.

In order to supply the plates to the applicator in sequential order, a string of such plates is presented to the applicator and provision is made to intermittently stop this string of plates so that the endmost one, that is, the plate indicated at 26 in Fig. 1; at 126 in Fig. 2, and at 226 in Fig. 4, may be delivered to the applicator for coating

while the successive plates in the string are restrained.

The restraining means shown in Fig. 1 include a stop pin 29 arranged to reciprocate in the slide or guide 27, which stop pin is normally in the path of movement of the string of plates, to engage the endmost plate and stop the string during the interval that a plate is coated. The stop pin 29 is operated by a lever 30 which is actuated by a rod 31 in timed relation with respect to the reciprocatory movement of a cross-head 37. Movement of the rod 31 is effected, at the proper time, to release the foremost plate 26 on the conveyor or slide, and this plate slides by gravity into the circular shield or guide 32, whereupon it falls onto the base portion 60, as hereinafter more fully described. The plates are supplied to the applicator, one by one, in timed relation, for coating.

The frame 33 of the applicator illustrated in Fig. 1 supports a driving shaft 34, at its top, which is driven by a chain 35 connected to a suitable source of power. Where the applicator is used in conjunction with a plate forming machine, the applicator will be driven in timed relation from the plate forming machine, through the chain 35.

Reference will now be had more especially to Fig. 1, wherein one form of applicator is disclosed, and which directs the liquid upwardly to the underface of an inverted paper pie plate.

The frame 33 includes the ways 36 and a cross head 37, slidably supported thereby, is normally retained in the upper position in said ways by the springs 38. The cross head mounts a roller 39 which is a cam follower, and is engaged by a cam 40, carried by shaft 34 and rotatable thereby. Thus, the cross head is reciprocated by the cam and springs, respectively, toward and away from the applicator base.

The cross head carries in depending relation a female surfaced pressing head 41, which is of sponge rubber and is backed by a plate 42 having a stem 43 rotatably associated with the cross head.

The cross head includes a passage 44 connected to a source of vacuum, not shown, by a line 45 controlled by a vacuum controlling valve 46. The stem 43 is channeled as at 47, as well as the pressing head as at 48. Thus, when the vacuum is applied to the respective connected passages, suction is applied to the inner face of the pressing head 41.

The plate portion 42 of the head rotatably supports in diametrical relation, a pair of rollers or cam followers 49, the purpose of which will be set more fully hereinafter.

The cross head supports an actuator 50 which terminates in a hingedly supported member 51 which is gravity or spring retained, as desired, in the position shown in Fig. 1. The stop releasing rod 31 includes a catch 52 having a cam face 53 and member 51 has the cam face 54. Rod 31 is retained in the lowered position by gravity acting thereon, as well as by the spring 55 associated with lever 30. The rod is aligned and maintained in juxtaposition relatively to member 51 by means of the guide pin 56 mounted in the elongated slot 57 in the upper end of rod 31 and which is slightly inclined relatively to the longitudinal axis of the rod.

In the downward movement of the cross head, the member 51 tilts upon its pivotal connection as the face 54 rides over face 53, and no actuation of rod 31 occurs. Upon the return movement of the cross head, member 51 engages face 52 of the catch and elevates the rod 31 to actuate lever 30 to withdraw stop 29 and release a plate 26 to the applicator. This occurs very near the end of the upper travel of the cross head. Member 51 then separates from member 52.

The applicator proper includes a base portion 60 which herein is shown as provided with two concentric annular chambers 61 and 62. Chamber 62 is connected by a line 63 to a supply tank or reservoir 64 and chamber 61 is connected to a pressure supply line 65 connected to a pump 66, in turn connected by line 67 to the supply tank, said supply tank containing the liquid coating material to be applied to the interior face of the plate.

A motor 68 is connected to a source of energy by a line 69 and a line 70 connects to a switch 71, in turn connected by a line 72 to the motor. The switch includes contacts 73 and the same are arranged in open circuit arrangement as the normal position. An actuator 74 is juxtapositioned relatively to one of the switch members and is normally retained elevated by spring 75. When the cross head is in lowered relation relatively to a plate and the applicator and with the plate thereon, the switch is closed, energizing the motor which operates the pump to supply the coating liquid under pressure to chamber 61 and whence it is discharged by pressure through the respective ports 77, shown clearly in Fig. 1.

The ports 77 are arranged in concentric, annular series and the conical portion 78 of the base 60 is radially grooved, as at 79, so that surplus liquid discharged through the ports 77 flows downwardly through grooves 79 into the annular groove 80 which is adapted to register with the rim of the inverted pie plate. The groove 80 discharges the surplus liquid thus drained thereto by passages 81 to chamber 62. However, it is to be understood that preferably the passages 81 are offset relatively to the radial grooves 79. This insures complete coverage of the coating upon the rim portion of the plate.

As previously set forth, the plate after being released by the stop 29, slides by gravity into the guide 32 in inverted relation and nests upon the top of the applicator base 60. Since this is a pressure application, it is preferred that the force of spring 75 be such that the mere deposition of the plate will be insufficient to actuate the switch controlling the motor. The time sequence is such that the cross head moves down and the pressing head 41 passes through the guide 32, engages the exterior and upper face of the inverted plate and presses it "home" upon the applicator base, and assists in registering the plate in predetermined position thereon. This positive pressure application is sufficient to close the switch, energizing the motor and actuating the pump to immediately secure the discharge of the coating liquid through the ports 77 to the underface or interior surface of the plate, some of the surplus liquid running down through grooves 79 to the annular groove 80.

In the continued pressure application and downward movement, each roller or cam follower 49 carried by the pressing head engages in the adjacent inclined slot 82 in one of the diametrically positioned cam structures and thus the pressing head 41 is caused to turn about its longitudinal axis with respect to the cross head which does not turn. In other words, pressing head 41 is oscillatorily mounted upon the longitudinal axis of the cross head. This oscillatory movement causes an oscillation of the plate upon the

elevated portion of the applicator base and insures practically uniform and complete distribution of the coating liquid upon the entire base exposed surface of the plate. The switch must permit this additional lowering movement (accomplishing rotation) while closed.

When this movement has been completed in timed sequence, the vacuum is applied to the interior face of the pressing head 41 which immediately grips the plate 26 so it is carried upwardly with the cross head and is held in elevated position until the vacuum is automatically released, whereupon the plate drops downwardly and tends to reregister in the guide 32.

Valve 46 in the vacuum line 45 is arranged to connect same to line 245 when handle 246 of the valve engages stop 247. The valve insures vacuum application until handle 246 engages stop 248 which disconnects lines 245 and 45 and bleeds line 45 to the atmosphere which bleeding releases the plate 26 that has been elevated.

At this period of operation, which corresponds approximately to the period when the stop 29 is retracted, the transfer member 83 is in position to catch the plate when released by vacuum and permits it to slide down the dual members 83—see Figs. 1 and 3—to the apron 84 which discharges the plate 26 in inverted or upside-down relation onto a wire or screen like conveyor 85, which is of endless character, the upper run passing over a suitable heating device 86 in an oven 87. The heat in this oven dries and tempers the coating so that upon discharge from the oven, the plates may be readily stacked without sticking together. The discharge may be so associated, for example, with a cross belt which would catch all of the plates from the several applicators of one or more machines and all plates then could be automatically stacked and counted by standard machinery at present employed in the plate making industry but at the station immediately following the formation of the plate. It will, of course, be apparent that the oven construction may have the heat source positioned above the upper run of the conveyor instead of below the upper run thereof, see Fig. 2, or may have two sources of heat, one above and one below the conveyor—see Fig. 2. Also, it is not necessary that the lower heat source be positioned between the two rows, as illustrated in Fig. 1, such illustration merely being representative of a heat source in the oven.

Also, a single oven structure of suitable width with a corresponding suitable width conveyor may be associated with all of the applicators of one machine. Preferably, the power transmission of the plate forming machine or shaft 34 of the applicator to shaft 88 or the opposite end conveyor shaft, will be so modified that the desired peripheral speed of the conveyor 85 is attained and this associated with the heat source maintaining a desired temperature condition in the oven and the oven being of the desired length necessary, it is apparent that completely dried and tempered coated plates will be discharged from the oven without the plate interfering one with another in their passage through the oven. The obvious power connection between shaft 14 or 34 and the conveyors has been omitted for clearness.

Again referring to Fig. 1, it will be observed that cross head 37 includes an actuating bar 89 which is slidably associated with a rod 90 having an adjustable stop member 91 thereon and said actuator 89 bears upon a coil spring 92, in turn bearing upon an adjustable collar 93 secured to the rod. The end of the rod 90 is connected to pivoted arm 94, rigidly associated with the catching member 83 through shaft 291 supported in brackets 292, see Fig. 3. The dotted line position of members 83 and 94 in Fig. 1 represent the application position—that is, when so positioned the plate is having the liquid applied thereto; the full line positions illustrate the receiving position.

The guide 32 is slotted at 232 for clearance of members 83 and it is further enlarged circumferentially at its lower end as at 232a for plate clearance in its discharge to apron 84.

In the downward movement of the cross head, spring 92 is compressed and the member 83 is caused to tilt clockwise from the full line position to the dotted line position, clearing the pressing head 41. Then upon the return movement of the pressing head, the actuator near the end of its upward travel engages stop 91 to elevate rod 90 to quickly tilt member 83 from the dotted line position counterclockwise to a full line position shown in Fig. 1, so it is ready to catch the vacuum released coated plate when the vacuum is removed from the pressing head.

A reverse form of the apparatus is illustrated in Fig. 2 and the same includes the slide 127 which, however, is directly associated with a plate forming machine or other source of supply. Associated with the slide 127 is the plate stop member 129 actuated by lever 130, constrained toward plate stopping by spring 155 and actuated by rod 131 in turn actuated by member 151, as set forth with reference to the corresponding parts in Fig. 1.

The shaft 134 of the applicator mounts the cam 140 and is driven by the chain 135 in timed relation with the plate forming machine and from the shaft 14 thereof. The cross head 137 is slidably supported in the ways 136 and is normally constrained toward the elevated position by springs 138, the cam 140 causing the downward movement by engaging the follower 139 carried by the cross head. The cross head rotatably supports the stem 143 of the head 142. Carried thereby is a pair of cam followers in the form of rollers 149 which engage cams 182 by means of which the said head 142 is caused to oscillate. Only one cam and follower is shown.

A female formed base 160 is axially aligned with the guide 132. The plate 126 on conveyor 127 when released by stop 129, discharges into the guide 132 and settles into the well 160a of the base 160.

The frame of the machine supports a shaft 200 which carries a cam 201 that engages a plunger or knock-out member 202, spring constrained as at 203 toward the lowered position. A chain 204 is operatively connected to shaft 134 so that in predetermined timed sequence, the plunger 202, after the plate is coated, is elevated to eject or elevate the plate 126 from the well 160a. The ejector 202 carries an enlarged head 205. The base 160 includes a pair of diametrically positioned cam guides 182, the slot 182a thereof receiving the roller 149 to insure oscillatory movement of the head 142 in its translation, as previously set forth.

The head 142 constitutes in this form of the invention, the applicator. The reservoir for the coating material is indicated by the numeral 161 and the supply line 165 therefrom is regulated by a valve 166 which is normally open during the operation of the machine.

The chamber 161 of the applicator head discharges by means of ports 177 to the wall formed face of the pressure head. In this form of the invention, the ports 181 discharge coating material to the rim of the plate instead of conveying material from the rim of the plate as previously set forth. An additional series of discharge ports is indicated by the numeral 181a.

The entire face of the plunger face of the applicator head is cushioned by a distributing felt or like covering 199 and through which the liquid slowly but surely passes to the adjacent surface of the plate. The time sequence of operation is such that only the amount of liquid is permitetd to pass through the felt as is required to satisfactorily and fully coat the upper interior face of the paper pie plate.

The purpose of this form of the invention is substantially that as previousy set forth. In place of the vertically tiltable, transfer device, in the present form of the invention there may be provided a reciprocatory device 183, or the same may be pivoted and it is caused to move into the space between the base 160 and the guide 132 after the plunger ejector has been elevated to push the plate 126 on to the apron 184 for reception by the conveyor 185 associated with the oven 187 having therein the source of heat 186 herein illustrated as of dual character. The conveyor is of endless, open mesh character and driven by shaft 188 or the like in timed relation with the operation of the plate forming and applicating mechanisms, the power driving connections being omitted for clearness. Also, the specific power mechanism for actuating the transfer device 183 is omitted for clearness, although it is to be understood, it has the same timed relation as applicator 83 shown in Fig. 1, that is, it is normally in the retracted or inoperative position and is moved to the operative position immediately prior to or simultaneously with the release of the stop 129.

The foregoing description illustrates the normal operation when the plate is not carried upwardly with the pressing and applicator head. However, in the event the plate 126 should be carried upwardly when the head is elevated the following means insures release of the plate from said head. The head includes one or more devices, and herein two diametrically positioned devices are illustrated, each of which comprises a pin 300 which is slidably mounted in the pressing head and projects through the felt base 199 thereof and is normally projected outwardly and downwardly by means of spring 301.

In the downward movement of the presser head when the felt face engages the inside face of the plate, the rods 300 are caused to move upwardly to permit full seating of the pressing head and the subsequent alignment and full seating of the plate 126 with respect to the well 160a in the base. Upon upward movement of the pressing head, should the plate be carried upwardly therewith, springs 301 project the rods or pins 300 downwardly and outwardly and serve to break the adhesion between the pressing head, herein of liquid supplying type, and the plate. Thus, the plate is not carried upwardly and retained on the head, but is released approximately in the guide 132 and settles downwardly until it engages on support 205 which, during this interval, remains elevated and immediately thereafter, the transfer member 183 is caused to move laterally the coated plate in normal position from the coating mechanism.

In Fig. 4 is illustrated a modified form of the plate turning device, and a modified form of a movable head, from those shown in Fig. 1. In this figure similar numerals of the two hundred series indicate similar parts.

The paper dish, such as the pie plate or the like, may be discharged from a plate making machine to the chute 225, then inverted and trapped on portion 227 by suitable means, such means being operable in timed relation to release a plate to the coating mechanism.

The turning mechanism includes a ledge 224 spaced from portion 225 and is backed by a stop wall 224a. Rigid therewith is a guide wall 228 apertured at 228a. Wall 227 may be connected to chute wall 225 as at 227a or the same may be omitted.

When molded or pulp plates are utilized, after formation, they are usually stacked after curing (drying) is completed. These may be manually fed or supplied to a chute 225 as in Fig. 4, and inverted automatically or if fed from the stack in inverted relation, the inverters may be omitted. Of course, if plates of this character are fed to the coater illustrated in Fig. 2, no inverter is employed.

In Fig. 4, the head structure is caused to move toward the base of the coating mechanism by any suitable means such as illustrated in the upper portions of Figs. 1 and 2. It will be noted that member 278 is of somewhat flat cone formation. The purpose thereof is to insure, upon head application of pressure, that the liquid coating discharged to the face of the plate is gradually squeezed radially outward toward the rim. In this movement, of course, the plate rotates, as aforesaid, so that complete coverage and uniform depth of coating is obtained on the plate surface.

The transfer device in Fig. 4 differs from that shown in Fig. 1 in that it is provided with a stop 283a against which the plate rests when released from the vacuum lifting head. In this instance, support 283 instead of moving to a substantially vertical position, see dotted lines in Fig. 1, moves clockwise to a greater degree which inverts the plate as well as transfers same so that it is deposited onto the conveyor 285 in inverted (or upright) relation with respect to the deposition of the plate 26 upon conveyor 85 in Fig. 1A.

In Figs. 5 and 6 is illustrated a modified form of head structure applicable broadly to the coating head shown in Fig. 2, as well as the pressing heads shown in Figs. 1 and 4.

In said Figs. 5 and 6, the crosshead 337 is reciprocated in any suitable manner. Laterally associated therewith is the supplementary crosshead 337a as by means of the dovetail interlock 337b. In this form of the invention, the plate rotative structure operated by relative movement between base and head is of a character all of which is carried by the reciprocating part. Of course, a reverse arrangement similar thereto might be employed with the base shown in Fig. 2.

Herein a depending portion 282 has inclined slots 282a. Stem 243 slidably mounted in the bore in the auxiliary crosshead is yieldingly projected outwardly by spring 243a. Stem 243 terminates in the plate 242 herein grippingly supporting pressing head 241. The stem and head are apertured as at 247 and 248, respectively, as well as the auxiliary crosshead as at 244. Stem 243 carries pins 249 which ride in slots 282.

Until head 241 engages the paper plate, no rotative movement occurs. When such engagement

occurs in the further downward movement of crosshead 337, spring 243a is compressed and the entire pressing head including stem 243, is caused to rotate and this also rotates the plate.

Upon return movement of the head, the reverse rotation occurs, only in this instance, due to the vacuum lifting of the plate, it rotates therewith as well. Upon vacuum release, the plate is released to the transfer device or transfer and inverting device illustrated in Figs. 1 or 4, respectively.

The form of the invention illustrated in Figs. 5 and 6 permits the relatively easy removal of the head for a given diameter plate and the substitution of another of different diameter. Of course, the coating base would also be changed to the one of corresponding size.

It will be readily apparent that if the lower base of Fig. 1 were associated with the head of Fig. 2 and with but slight modifications necessary for plate ejection, both sides of the plate could be coated simultaneously. Of course, while herein the inside of the plate is coated in each instance, a suitable reversal in the base and head conformations would make each of the such devices suitable for coating the outside of the plate. It is contemplated within the scope of this invention to interpose such outside coating device between the drying mechanism and the first or interior coating mechanism, the interior coater discharging to a slide provided with a releasable stop operable as described herein in timed relation with the exterior coater. Naturally, the exterior may be first coated and then the interior if two stage coating is desired.

While the invention has been described as to pie plates, it is to be understood that all paper dishes are contemplated as within the scope of invention, and except for such claims as recite rotation for coating, the outline of the plate need not be circular or substantially circular. The term "plate" is intended to include dishes.

The form of flat conical coating head or base shown in Fig. 4 permits substantially uniform distribution of the coating without relative plate rotation. Thus, square or octagonal plates may be coated.

It is highly desirable to dry as quickly as possible said coating so as to insure retention of the light yellow color and the uniform distribution, as for example, on the rim.

While the invention has been set forth in great detail in the foregoing specification, it is to be understood that the same is illustrative and not restrictive in character and that various modifications, including those hereinbefore mentioned and illustrated as well as many others which will suggest themselves to persons skilled in this art, are all considered to be within the broad scope of this invention, reference being had to the appended claims, said broad scope of the invention being directed to the process, the complete coating automatically in timed relation with respect to the formation of paper pie plates, of said plates and the subsequent drying and tempering of the coating upon the plates to prevent them from sticking together when stacked.

The invention claimed is:

1. A paper plate coating apparatus, including a base member for receiving and supporting a plate to be coated, a head member, means for moving one of said members toward the other for clamping the plate therebetween, one of said members being of the reservoir type and including a plurality of discharge ports for the coating fluid, and means for causing rotary movement of one of said members for effecting distribution of said coating fluid over the surface of said plate.

2. A paper plate coating apparatus, including a base member, a head member, means for moving one of said members toward the other for clamping a plate therebetween, one of said members being of the reservoir type and including a plurality of discharge ports for the application therethrough of a coating fluid, and means movable between the members when separated for transferring the plate from the members.

3. A paper plate coating apparatus, including a base member, a head member, means for moving one of said members toward the other for clamping a plate therebetween, one of said members being of reservoir type and including a plurality of discharge ports, means for causing rotary movement of one of said members for coating distribution, and means movable between the members when separated for transferring the plate from the members.

4. A coating apparatus for paper plates and the like, including a plate supporting base member having ports discharging to the plate supporting surface thereof, means for supplying coating material under pressure to said ports, the surface of the base corresponding with the supported surface of the plate, a head member for engaging the opposite face of the plate and complementarily formed, vacuum operable means associated with the head member, means for causing one of said members to approach and recede from the other member for clamping a plate therebetween, and means automatically operable when the two members are in plate clamping engagement for insuring coating discharge through the base ports during the clamping engagement, said vacuum operable means being effective upon recessional movement of the movable member from the other member for plate elevation.

5. A device as defined by claim 4, characterized by the addition of means operable in timed relation with the recessional movement of the movable member and near the end thereof for receiving the plate when released from the vacuum means for transferring the plate from the coating mechanism.

6. A coating apparatus for paper plates and the like, including a base member, a head member, means for moving one of said members toward and away from the other member, the head member having a ported face for discharging coating material thereto, distributing and discharge restricting means associated with said face, means normally constrained to separate a plate from said restricting means and automatically retractile to non-separating position upon plate engagement, the base member and the distributing means being complementarily formed and conforming to the opposite faces of the plate, and ejecting means operatively associated with the base member and operable in timed relation relative to the movement of the one member away from the other member.

7. A device as defined by claim 6, characterized by the addition of means operable in timed relation with the recessional movement of the movable member and near the end thereof for engaging the plate following ejection from the base member.

8. A device as defined by claim 4, characterized by the addition of means operable in timed relation with the recessional movement of the mov-

able member and near the end thereof for receiving the plate when released from the vacuum for transferring the plate from the coating mechanism, and inverting the plate.

9. Coating apparatus comprising a pair of male and female members, means for moving said members relatively toward and away from each other to engage and disengage an article to be coated positioned therebetween, means for supplying a coating composition to the male member, means for relatively rotating said members to distribute said coating composition, and means for supplying vacuum to the female member to assist in the separation of said coated article from the male member.

10. Coating apparatus comprising a pair of members, means for moving said members relatively toward and away from each other to engage and disengage an article to be coated positioned therebetween, means for supplying a coating composition to one of said members, means for relatively rotating said members to distribute said coating composition, and means for causing said coated article to be separated from the member having the coating composition supply.

11. Coating apparatus comprising a base member and a movable head member, one of said members constituting a reservoir for a coating composition and having an apertured face for the distribution of said composition therethrough to an article to be coated, means for moving said members linearly and rotatably relative to each other, and means for causing said article after being coated to be separated from the member constituting the reservoir.

12. Coating apparatus comprising a base member and a movable head member, the base members constituting a reservoir for a coating composition and having an apertured face for the distribution of said composition therethrough to an article to be coated, means for moving said members linearly and rotatably relative to each other, and vacuum means for causing said article after being coated to move with the movable head member during separation of said members.

13. Coating apparatus comprising a male member having a porous face for the distribution of a coating fluid therethrough, a female member of resilient material, said members being linearly and rotatably movable relative to each other to engage an article therebetween and coat a surface thereof, and means for holding said article against said female member during separation of said members.

14. Coating apparatus comprising a male member having a porous face for the distribution of a coating fluid therethrough, a female member of resilient material, said members being linearly and rotatably movable relative to each other to engage an article therebetween and coat a surface thereof, means for rotating said article relative to said male member during contact of said article with said porous face to facilitate the distribution of said coating fluid and means for holding said article against said female member during separation of said members.

15. Coating apparatus comprising a male member having a porous face for the distribution of a coating fluid therethrough, a female member of resilient material, said members being linearly and rotatably movable relative to each other to engage an article therebetween and coat a surface thereof, means for holding said article against said female member during separation of said members, and means operative to catch and discharge said coated article upon release of said holding means.

16. Coating apparatus comprising a male coating and distributing head, a female head cooperating therewith, means for delivering an article to be coated to said male head, means for bringing said heads together with said article therebetween, means for relatively rotating said heads to spread a coating material applied through said male head over a surface of said article, means for separating said heads, means for causing said article to be discharged from said male head, and a driving mechanism associated with all of said means for actuating said means in synchronism.

17. In a paper plate coating apparatus, a male head having a reservoir for a coating fluid and having an apertured face for the distribution of said coating fluid therethrough, said face conforming generally to the interior contour of said plate, and means associated with said head and extending through said face to free said plate from said face after completion of the coating operation.

18. In a paper plate coating apparatus, the combination with a stationary male head having a reservoir of a coating fluid and an apertured distributing head, of a female head of resilient material having a passage therethrough for the application of suction to a plate, and means for moving said female head linearly and rotatably relative to said male head.

19. In a paper plate coating apparatus, the combination with a male head having a reservoir of a coating fluid and an apertured distributing surface, of a cooperating female head conforming to the contour of a plate bottom, and means for rotating said heads relative to each other for the application of said coating fluid to a plate supported by and between said heads.

20. In a paper plate coating apparatus, the combination with a male head having a reservoir of a coating fluid and an apertured distributing surface, of a cooperating female head relatively movable vertically with respect to said male head and conforming to the contour of a plate bottom, and means for rotating said heads relative to each other for the application of said coating fluid to a plate supported by and between said heads.

PAUL R. SIMMONS.