E. E. LAWRENCE.

PROCESS OF FORMING FILLED WAFERS.

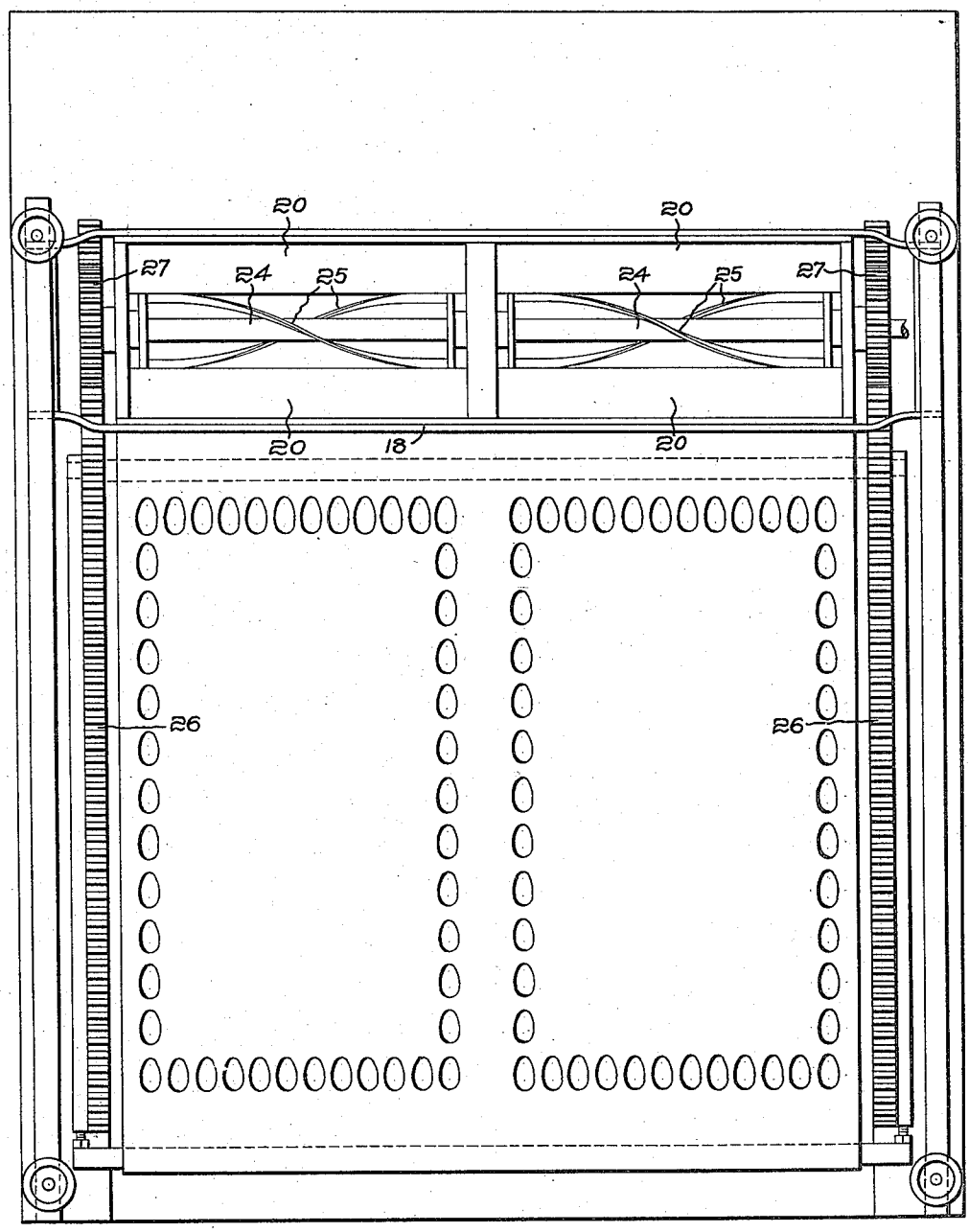
APPLICATION FILED JAN. 3, 1914.

1,166,056.

Patented Dec. 28, 1915.

5 SHEETS—SHEET 1.

Fig. 1.



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COLUMBIA PLANOGRAPH CO., WASHINGTON, D. C.

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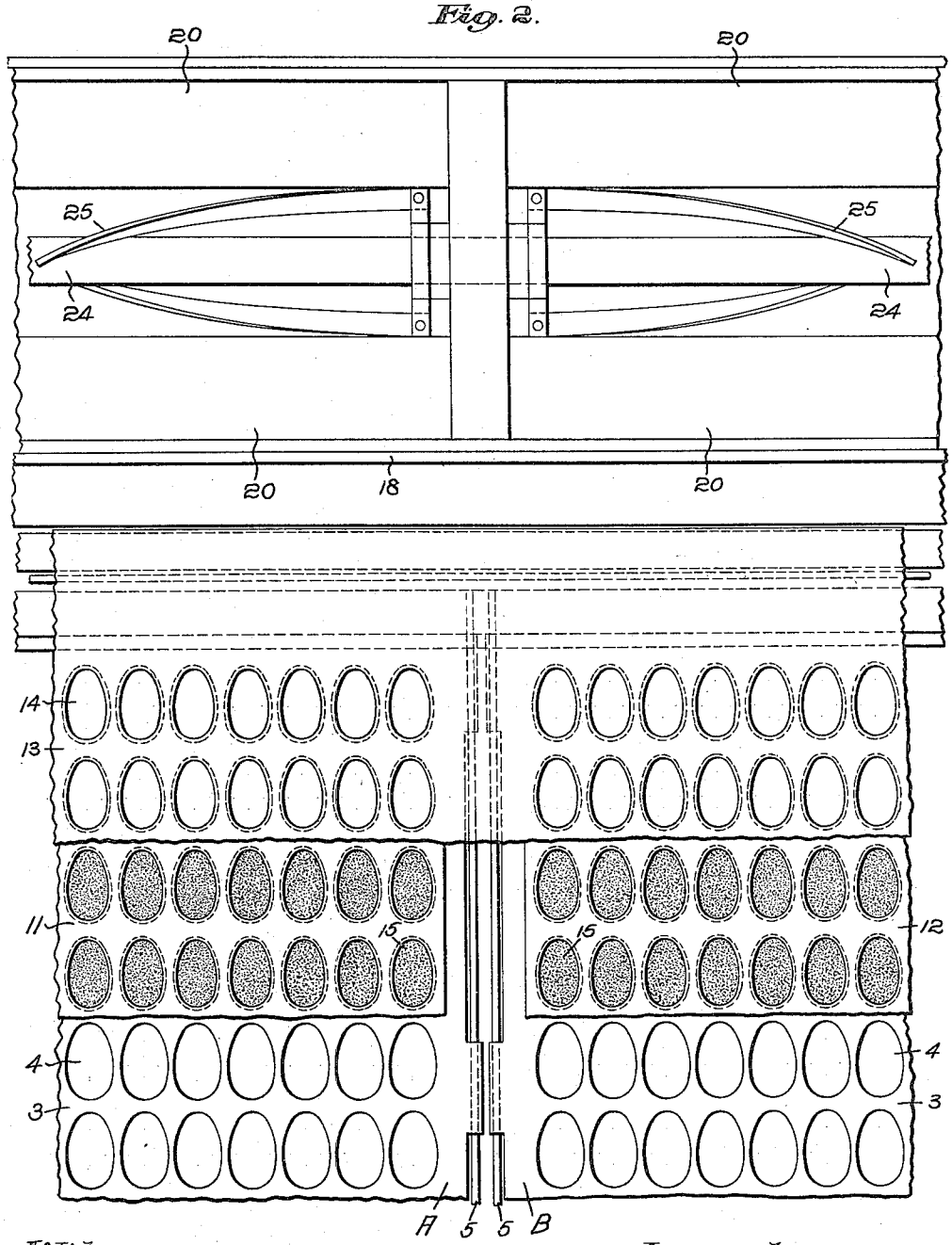
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5 SHEETS—SHEET 2.

Fig. 2.



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5 SHEETS—SHEET 3.

Fig. 3

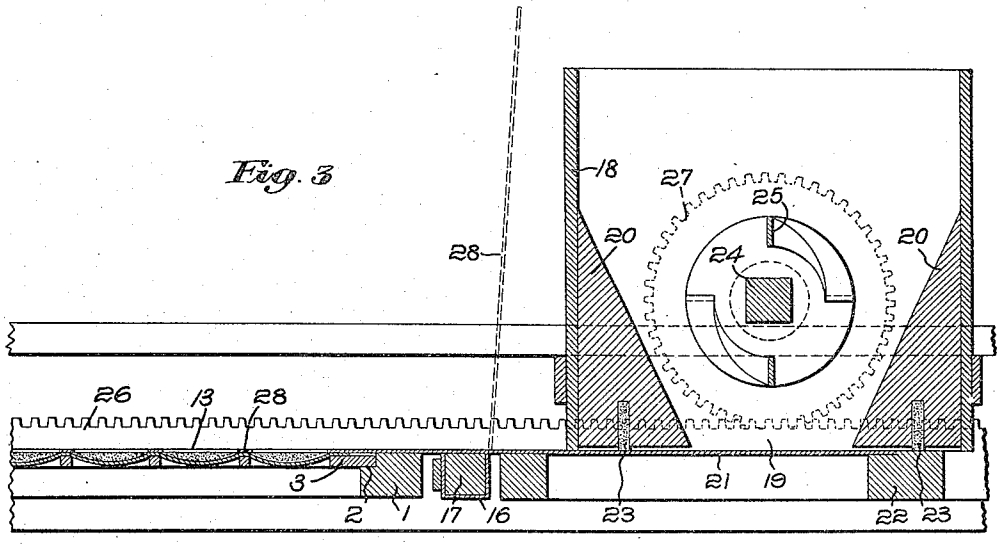
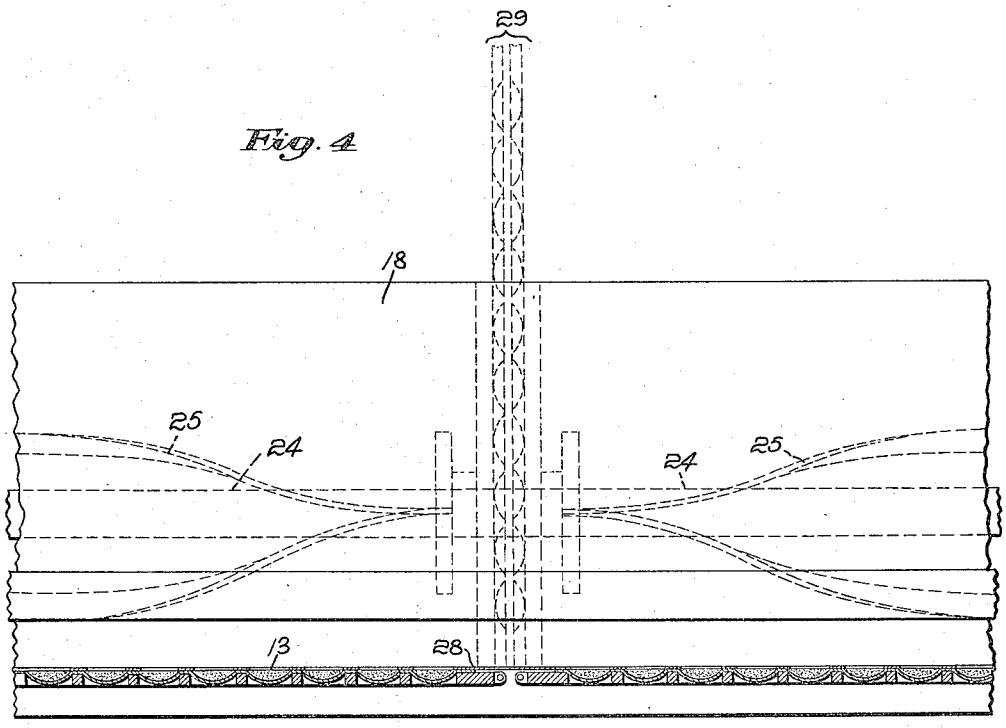


Fig. 4



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5 SHEETS—SHEET 4.

Fig. 5

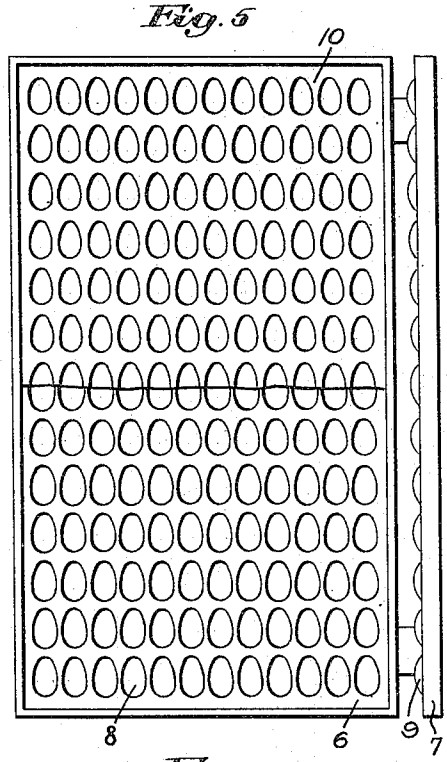


Fig. 8

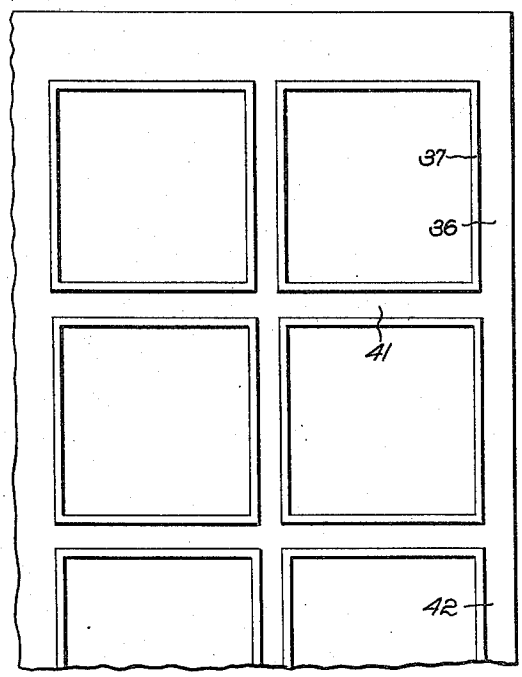


Fig. 6

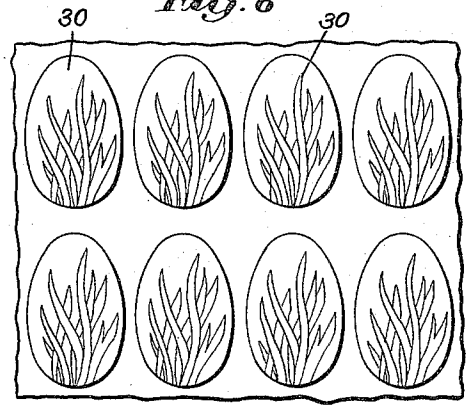


Fig. 9.

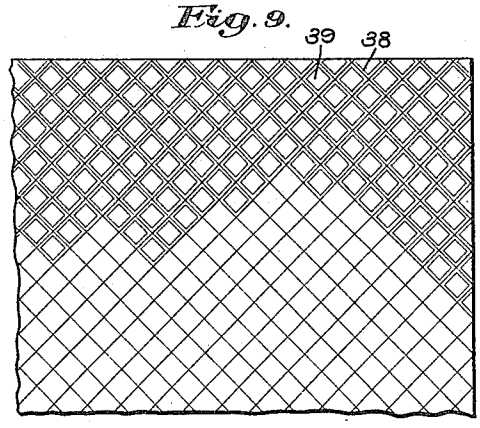


Fig. 7.

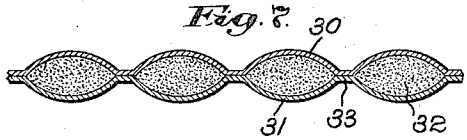
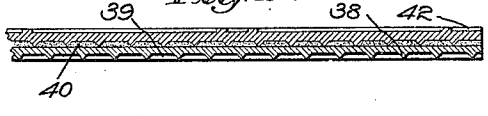


Fig. 10.



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5 SHEETS—SHEET 5.

Fig. 11.

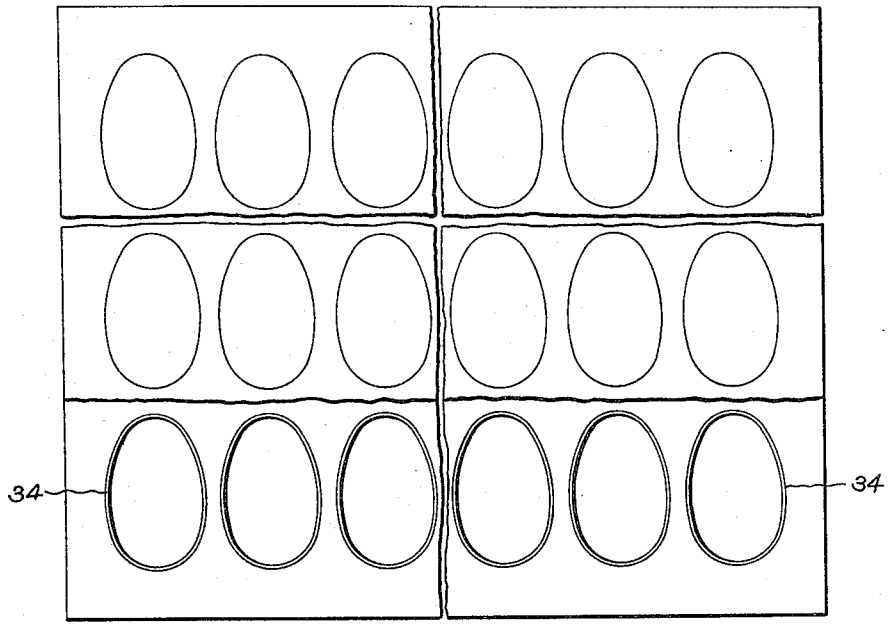
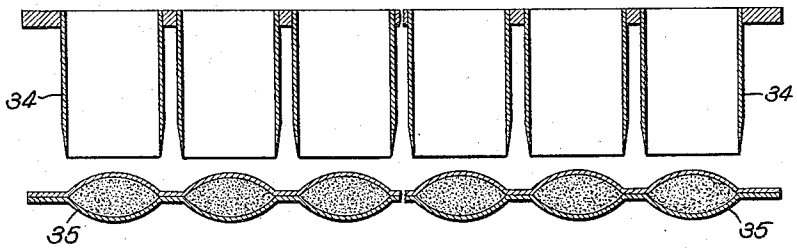


Fig. 12.



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UNITED STATES PATENT OFFICE.

EDWARD E. LAWRENCE, OF CAMBRIDGE, MASSACHUSETTS, ASSIGNOR TO LOOSE-WILES BISCUIT COMPANY, OF KANSAS CITY, MISSOURI, A CORPORATION OF MISSOURI.

PROCESS OF FORMING FILLED WAFERS.

1,166,056. Specification of Letters Patent. Patented Dec. 28, 1915.

Original application filed January 25, 1912, Serial No. 673,355. Divided and this application filed January 3, 1914. Serial No. 810,241.

To all whom it may concern:

Be it known that I, EDWARD E. LAWRENCE, a citizen of the United States, and a resident of Cambridge, in the county of Middlesex and State of Massachusetts, have invented an Improvement in Processes of Forming Filled Wafers, of which the following description, in connection with the accompanying drawings, is a specification, like characters on the drawings representing like parts.

This invention relates to the process of forming filled wafers.

This application is a division of my copending application Serial No. 673,355, filed January 25, 1912.

In order that the principle of the invention may be readily understood, I have disclosed in the accompanying drawing a single embodiment of means whereby said process may be carried out.

In the drawings:—Figure 1 is a plan view of one form of mechanism by which I may carry out my process; Fig. 2 is a plan view on an enlarged scale of a portion of the mechanism shown in Fig. 1; and representing also a portion of the wafer sheets; Fig. 3 is a vertical longitudinal section of a portion of the mechanism or apparatus by which I preferably practise my process; Fig. 4 is a transverse section taken through a portion of said mechanism or apparatus; Fig. 5 is a plan view of the mold wherein the wafer sheets may be formed and showing the same open; Fig. 6 is a plan view of a portion of the complete wafer sheet before segregation; Fig. 7 is a transverse section taken therethrough; Fig. 8 is a plan view of one sheet pertaining to another form of filled wafer; Fig. 9 is a plan view of the other sheet thereof; Fig. 10 is a transverse section taken through both sheets and the filling; Fig. 11 is a diagrammatic view representing the simultaneous severance of the filled wafer sheets into ultimate pieces; and Fig. 12 is a transverse section taken through the filled wafer sheets and the simultaneously acting cutters.

Filled wafers and like articles of food have heretofore customarily been formed by preparing wafer sheets in suitable molds and applying the filling to one of them by a palette knife, which is manually drawn across the entire surface thereof when positioned upon a slab or other suitable support, after which the other wafer sheet is superimposed thereon. Not only is the filling necessarily applied to the entire surface of the sheet, but a considerable proportion thereof is wasted because spread onto the adjacent surrounding portions of the slab or other support. Moreover it is impossible in this manner of application to apply the filling evenly to the sheet, and without either a deficiency or an excess of material. After the covering wafer sheet has been superimposed upon the filling, the sheets are subdivided into individual pieces. Not only is there very considerable loss of filling that is not confined to the wafer sheet, but is spread onto the support, but there is also the loss of that portion of the filling applied to those parts of the wafer sheet that are between the ultimate or segregated wafers. Particularly is this true when the wafer sheets are molded into spaced concavities in the formation of artificial nuts or similar articles which are ultimately severed close to the concavities with the consequent loss of the flat or connecting portion of the wafer sheets. When a sheet has been molded into spaced concavities for the formation of artificial nuts or the like, it is a matter of exceeding difficulty to apply the filling thereto without crushing a considerable percentage of the concavities or breaking the connecting portions of the wafer sheet, thus ruining the entire sheet. Furthermore there is a very substantial loss in the breaking of the wafer sheets not only in the manual application of the filling thereto, but also in the cutting of the sheets into strips and into ultimate individual pieces.

In carrying out my process, I mold the sheets into suitable form. This I may do by forming spaced concavities in said sheets. I then support the said sheets in any suitable manner, and preferably by applying thereto a supporting plate having openings or concavities corresponding in shape and position to the concavities of the wafer sheet, assuming the latter is to be so molded. I then suitably shield the portions of the sheet between the concavities or other spaced areas to which the filling is to be applied. This I may do in any suit-

able manner, but preferably by superimposing upon the wafer sheet a die or stencil plate having openings corresponding in position and size to the segregated or spaced areas, to which alone the filling is to be applied. Thereupon I apply the filling preferably by a relative movement of reciprocation of the supporting mold plate, the wafer sheet or the stencil or die plate with respect to a suitable hopper or other source of supply. After the filling has been applied, the stencil plate is removed and then preferably the filled wafer sheet is inverted upon another filled wafer sheet by bringing the filled segregated areas into coincidence. In order to prevent the breaking of the filled wafer sheets in the separation thereof into individual pieces, I preferably simultaneously sever the wafer sheets into the ultimate pieces and then preferably subject the said completed pieces to a cooling action to harden the filling, and thereby effect the binding of the wafer sheets together by the hardened filling.

It will be evident that the discarded portions of the wafer sheet between the concavities or other formations do not contain filling, and therefore there is not only no loss of filling, but the said severed portions of the wafer sheets may themselves be employed in other processes of manufacture,—that is to say, in the formation of other products.

I shall now proceed to describe in detail one form of mechanism or apparatus by which I may practise my process, it being clearly understood that said process may be otherwise practised either mechanically or manually.

Referring first to Figs. 1 to 4 inclusive, I have therein represented a suitable frame or supporting table or bed upon which is mounted a skeleton frame 1, (a portion is indicated in section in Fig. 3) adapted to receive upon the shouldered face 2 thereof a suitable supporting mold plate 3, which is herein represented as provided with openings 4. The supporting mold plate is provided with openings when the wafer sheet is spaced into concavities, in order that the said concavities may enter said openings and the sheet be supported by the connecting flat portions of the sheet flatwise against the plate 3 between the openings 4 thereof. While the plate 3 may be continuous throughout, I preferably form the same in two sections A, B, clearly indicated in Fig. 2, and mount them upon parallel rods 5, 5, which are supported upon the shouldered portion 2 of the frame 1, so as to permit the two sections A, B of the plate 3 to be swung upwardly to bring the wafer sheets into contact as indicated in dotted lines in Fig. 4.

The wafer sheets which are composed of any usual material, and which are generally thin and fragile, are formed by applying the dough to a mold such as indicated at 6, 7 in Fig. 5, wherein I have represented two members of a mold provided with concavities 8 and entering projections 9 to mold the dough or filled sheet 10 between them into desired shape. I have herein disclosed my process as practised in the molding of a wafer sheet with spaced concavities to form nut sections, commonly known when completed as almonds or philopenas. After the severed sheets have been molded, I then apply two wafer sheets 11, 12 to the mold supporting plates A, B, as indicated most clearly in Fig. 2, after which I superimpose upon the wafer sheets a die or stencil plate 13 having openings 14 corresponding in size and position to the concavities of the wafer sheets. The said die or stencil plate 13 may be a continuous sheet overlying both wafer sheets 11, 12. This die or stencil plate may be of any suitable material, but is preferably of copper and is preferably made as thin as possible, so that the amount of filling 15 applied to the concavities of the wafer sheets may protrude beyond the level of the wafer sheets to a minimum extent, but nevertheless sufficiently to insure the binding together of the wafer sheets by the meeting protruding surfaces of the filling when two wafer sheets are brought in coincidence. In other forms of mechanism for practising my process, however, and particularly wherein the wafer sheet is not molded into well defined concavities, the stencil plate is customarily thicker so as to secure the application of thicker layers of filling thereto.

As shown most clearly in Fig. 3, the die or stencil plate 13 is wrapped or otherwise secured at its rear end 16 about a transverse rod or bar 17 suitably supported upon the frame, and if desired provided with members adapted to be swung upwardly so as to lift the die or stencil plate off the wafer sheets after the latter have had the filling applied thereto.

In order to apply the filling to the wafer sheet or sheets, I preferably provide a hopper 18, indicated most clearly in Figs. 1 and 3, wherein it is shown as of box-like form having an open bottom 19 with preferably inclined lower walls 20. When the mechanism is not in operation, the hopper is supported at the rear of the die or stencil plate upon an imperforate plate 21, which is itself supported upon the portion 22 of the frame. Preferably I provide the lower face of the hopper with longitudinally extending wipers 23 of felt or other suitable material to insure the proper application of the filling to the openings of the stencil plate 13. The hopper 18 is provided with a suitable shaft 24, whereon is fast one or it may be a plu-

rality of rotatable stirrers or mixer blades 25 which serve to enforce the discharge of the filling through the open bottom 19 during the relative reciprocation of the hopper and wafer sheet or sheets.

In that form of mechanism herein illustrated, I have represented the hopper as movable to and from over the die or stencil 13. For this purpose, I have herein represented the frame as having fast thereon a pair of horizontal racks 26 extending from front to rear and with which mesh the pinions 27 fast upon the shaft 24. At one or both ends the shaft 24 may extend beyond the pinion or pinions 27, and be there provided with a crank handle or other suitable device to effect the rotation of the shaft 24.

It will be obvious that in the to and fro reciprocation of the hopper 18, the filling is discharged only through the openings 14 of the stencil plate and that the filling is discharged in such measured or predetermined quantities that such filling also extends from the base of the concavities to the upper face of the die or stencil plate 13, so that it protrudes beyond the level of the mouth of the concavities to an extent dependent upon the thickness of the die or stencil plate. In this manner, I secure a predetermined slight excess of filling material which, when two wafer sheets are brought into coincidence, compels the binding or sealing together of the wafer sheets thereby. In former processes so far as I am aware, either the filling material was supplied in such deficiency that it did not extend to or beyond the level of the wafer sheet and thus did not effect the sealing or binding of wafer sheets together, or it was applied in such excess that there was a great loss of filling material between the concavities and an improper union of the wafer sheets.

In former processes so far as I am aware, it is customary merely to support the molded wafer sheet upon an open slab and to spread the filling thereon by a knife or blade. If during the molding or prior to the application of the filling, the wafer sheet were broken, it was substantially impossible to use the broken sheet, not only for the reason that the sheet could not be positioned to receive the filling, but also because the broken sheet could not be so positioned that after the filling, another sheet having corresponding concavities could be superimposed thereon into coincidence. This resulted in the loss of all broken sheets.

In the practice of my process, in accordance with which the wafer sheets are positioned upon the mold plate or plates and are afterward covered with a stencil plate, it is an easy matter to use broken portions of wafer sheets by fitting them onto the mold plates A, B with their concavities resting in the openings 3 thereof, it being immaterial that the flat portions of the wafer sheets overlie. It is a usual custom in the practice of my invention, for the workmen to keep a supply of broken sheets, from which he may quickly select a piece to patch out a wafer sheet from which he has been compelled to break off a damaged portion. In this manner substantially all loss of broken wafer sheets is eliminated, and further than this the broken pieces are always correctly positioned with respect to the sheet that is to be superimposed thereon, because all portions of both sheets are correctly positioned by reason of the openings 4 in the supporting mold plate 3. After the filling has been applied to the wafer sheets and the hopper has been returned to its inoperative position, the die or stencil plate 13 is swung into elevated position, as indicated in dotted lines at 28 in Fig. 3, and thereupon the two sections A, B of the mold plate are swung into elevated position as indicated at 29 in Fig. 4, so as to bring the wafer and sections together with the segregated filling area in coincidence.

In Figs. 6 and 7, I have represented in plan and cross section a portion of superposed filled wafer sheets where at 30 is represented the upper wafer sheet and at 31 the lower wafer sheet, and at 32 the filling which serves to bind or seal the wafer sheets together. The connecting or flat portions 33 of the wafer sheets are devoid of filling, as indicated, so that all loss of filling between the concavities is wholly eliminated. After the filled wafer sheets have been brought into register or coincidence as described, I then cut the filled wafer sheets into individual or ultimate pieces and preferably I simultaneously sever the said sheets into all their ultimate pieces. Obviously this step of my process may be effected in any suitable manner. Preferably, however, I remove the filled and adhering wafer sheets to a suitable severing mechanism shown diagrammatically in Figs. 11 and 12, and having a gang of knives 34, which are operated simultaneously so as to cut the filled wafer sheets 35 simultaneously into individual or ultimate pieces. I thus avoid that breakage of pieces of wafer sections that necessarily occurs when the filled sheets are severed into strips and afterward cut transversely into ultimate pieces.

In order to prevent the slipping of the two sections of each completed piece upon each other, I harden the filling by cooling the ultimate pieces or the filled sheets. Preferably I cool the individual pieces after severance in any suitable manner.

Instead of molding or superimposing the wafer sheets as described, I may employ wholly flat sheets and make, mark or form them in any suitable manner for the reception of the filling. In Fig. 8, I have repre-

sented one face of a wafer sheet 36 having ridges or substantially rectangular markings 37 thereon, and in Fig. 9, a second sheet 38 having its face provided with small diagonally arranged pockets or shallow recesses 39. If desired, each sheet may be for one face formed as shown in Fig. 8, and the opposite face formed as shown in Fig. 9, or they may be formed or marked in any other suitable manner. These sheets are superimposed one upon the other as indicated in Fig. 10. After the filling 40 has been applied thereto in the manner already indicated, the filled sheets are severed in any suitable manner, and preferably by a gang of simultaneously operating knives in the manner already described.

In applying filling to a sheet such as shown in Fig. 8 or Fig. 9 in accordance with methods of procedure heretofore practised, the filling has been applied necessarily not only within the boundaries of the rectangular markings or formations 37 and to the narrow longitudinal and cross areas 41, but also to the surrounding areas 42, and in fact to the surrounding portions of the slab or support, as already set forth. When the filled sheets are severed by the gang of knives to which I have referred, there is customarily cut out by the knives strips or pieces of the material corresponding to the areas 41, 42. In the methods of procedure heretofore practised, these discarded areas were coated with filling, which were therefore necessarily lost. In practising my process, however, the stencil or die plate is provided with openings corresponding in position and size to the areas bounded by the markings or formations 37, and hence the filling is applied only within said boundaries in segregated areas, and no filling is lost when the filled sheets are severed.

It will be evident from the foregoing description that the filling may be applied with much greater speed than heretofore and in measured, predetermined quantities, so that neither an excess nor a deficiency in amount results, and furthermore the wafer sheets are protected while the filling is being applied thereto. A further and more important saving, however, is effected, because of the application of the filling to segregated areas only, so that when the sheets are severed into the ultimate pieces, no filling whatever is lost. Furthermore, owing to the fact that it is possible to use broken pieces of wafer sheets, a very large saving is thereby effected. Although I have disclosed an apparatus or mechanism by means of which certain steps of my process are carried out, it will be evident that said steps may be practised or carried out in any suitable manner, either by hand or mechanically.

Having thus described my process and one type of mechanism by which I may practise the same, I desire it to be understood that although specific terms are employed, they are used in a generic and descriptive sense and not for purposes of limitation, the scope of the invention being set forth in the following claims.

Claims.

1. That process of forming filled wafers consisting in molding a wafer sheet, shielding the portions of the sheet between spaced areas thereof, applying the filling to said spaced areas only, superimposing another wafer sheet upon said filling possessing sheet, and serving the superimposed sheets between said filled areas.

2. That method of forming filled wafers consisting in molding a wafer sheet, shielding the portion of the sheet between spaced areas thereof to be filled, applying the filling by a wiping action to the spaced areas thereof only, superimposing another wafer sheet upon said filling possessing sheet, and severing the superimposed sheets between said filled areas.

3. That method of forming filled wafers consisting in molding a wafer sheet into spaced concavities, shielding the portions of the wafer sheet between said concavities, applying filling in measured predetermined quantities to said concavities only, superimposing another wafer sheet upon said sheet having filling-containing concavities, and severing the superimposed sheets between said concavities.

4. That method of forming filled wafers consisting in molding a wafer sheet into spaced concavities, shielding the portions of the sheet between said concavities, applying filling to said concavities in measured quantities slightly exceeding the capacity of said concavities, superimposing another wafer sheet upon said sheet having filling containing concavities, and severing said superimposed sheets between said concavities.

5. That process of forming filled wafers consisting in molding two wafer sheets into spaced concavities, shielding the portions of said sheets between the concavities thereof, applying filling to said concavities only, superimposing one of said sheets upon the other and bringing the concavities thereof into register, and finally in severing said superimposed sheets between said concavities.

6. That method of forming filled wafers consisting in molding wafer sheets, shielding portions of one at least of said sheets, applying filling to the unshielded areas only of said sheet, superimposing one of said sheets upon another and simultaneously severing the entire superimposed sheets into ultimate units.

7. That process of forming filled wafers comprising exposing segregated areas only of a wafer sheet by shielding the interven-

ing portions of said sheet, applying filling material to said exposed areas, and superposing a second wafer sheet upon the first.

8. That process of forming filled wafers comprising exposing segregated areas only of a wafer sheet by shielding the intervening portions of said sheet, applying filling material by a wiping action to said exposed areas, and superposing a second wafer sheet upon the first.

9. That process of forming filled wafers comprising exposing segregated areas only of a wafer sheet by shielding the intervening portions of said sheet, applying filling material to said exposed areas, superposing a second wafer sheet upon the first, and severing said sheets between the applied filling areas.

10. That process of forming filled wafers comprising molding two wafer sheets, applying filling material in segregated areas only to at least one of said sheets, inverting one of said sheets upon the other, and severing the superposed sheets between said filled areas.

11. That process of forming filled wafers comprising molding two wafer sheets, applying filling material in segregated areas only to both of said sheets, inverting one of said sheets upon the other and severing the superposed sheets between the filled areas.

12. That process of forming filled wafers comprising molding two wafer sheets to form spaced molded areas, shielding the surface of said wafers between said molded areas, applying filling to the molded areas of at least one of said sheets, superimposing said sheets, and severing the sheets between said molded areas.

13. That process of forming filled wafers comprising molding two wafer sheets to form spaced molded areas, shielding the surface of said wafers between said molded areas, applying filling to the molded area of at least one of said sheets, and inverting one of said sheets upon the other.

14. That process of forming filled wafers comprising molding two wafer sheets to form spaced molded areas, shielding the surface of both of said wafers between said molded areas, applying filling to the molded areas of both of said sheets, superimposing said sheets, and severing said sheets between said molded areas.

15. That process of forming filled wafers comprising molding two wafer sheets to form spaced concavities, shielding the surface of both of said wafer sheets between said spaced concavities, applying filling to said spaced concavities of both sheets, inverting one of said sheets upon the other, and severing the sheets between said molded areas.

In testimony whereof, I have signed my name to this specification, in the presence of two subscribing witnesses.

EDWARD E. LAWRENCE.

Witneses:

ARTHUR C. ROCHE,

THOMAS J. SHEERIN.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."