Feb. 17, 1953 J. S. FINKE 2,628,576

ICE-CREAM CONE ROLLING MACHINE

Filed Sept. 5, 1950 4 Sheets-Sheet 1

FIG. 1.

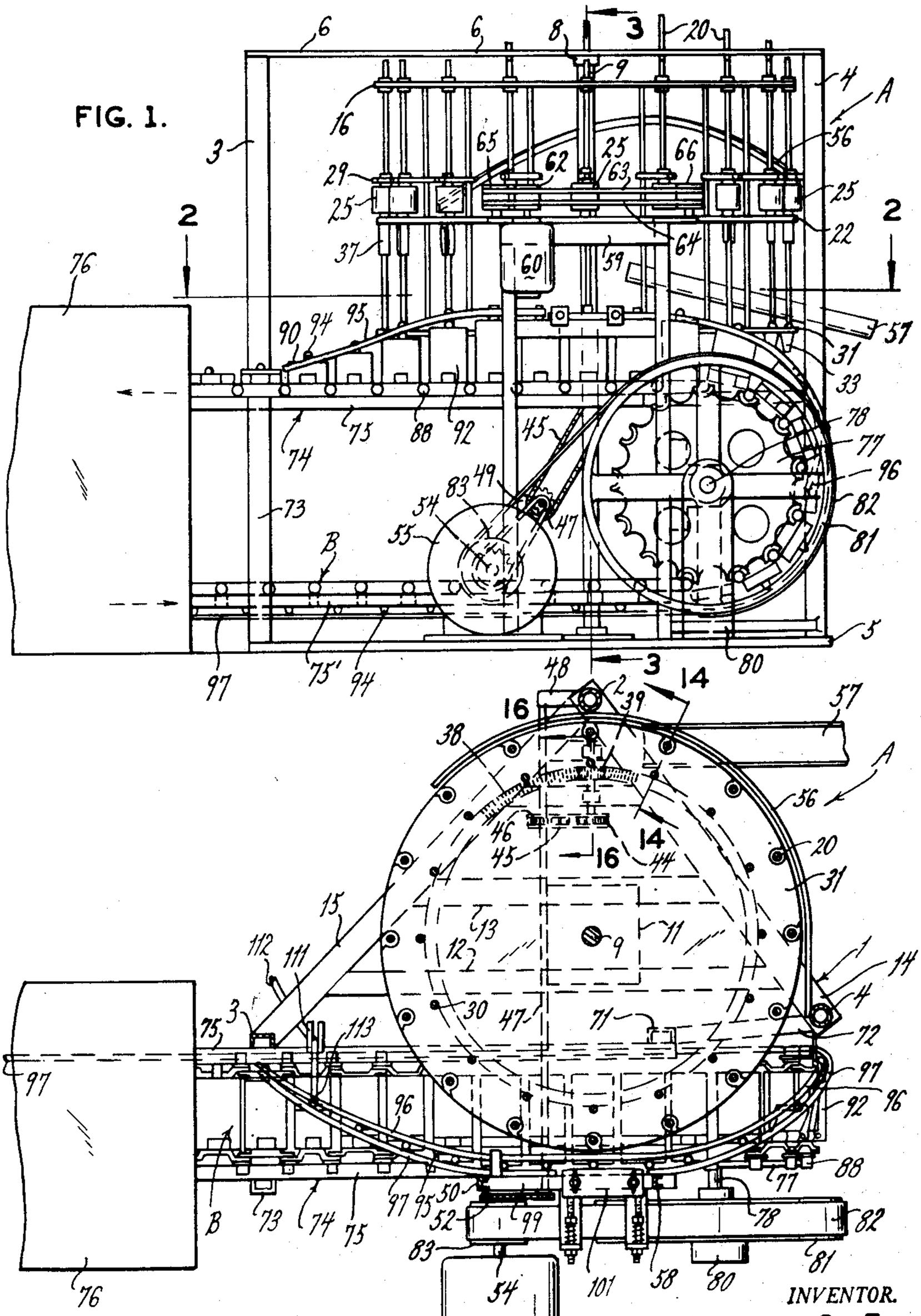

FIG. 2.

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ICE-CREAM CONE ROLLING MACHINE

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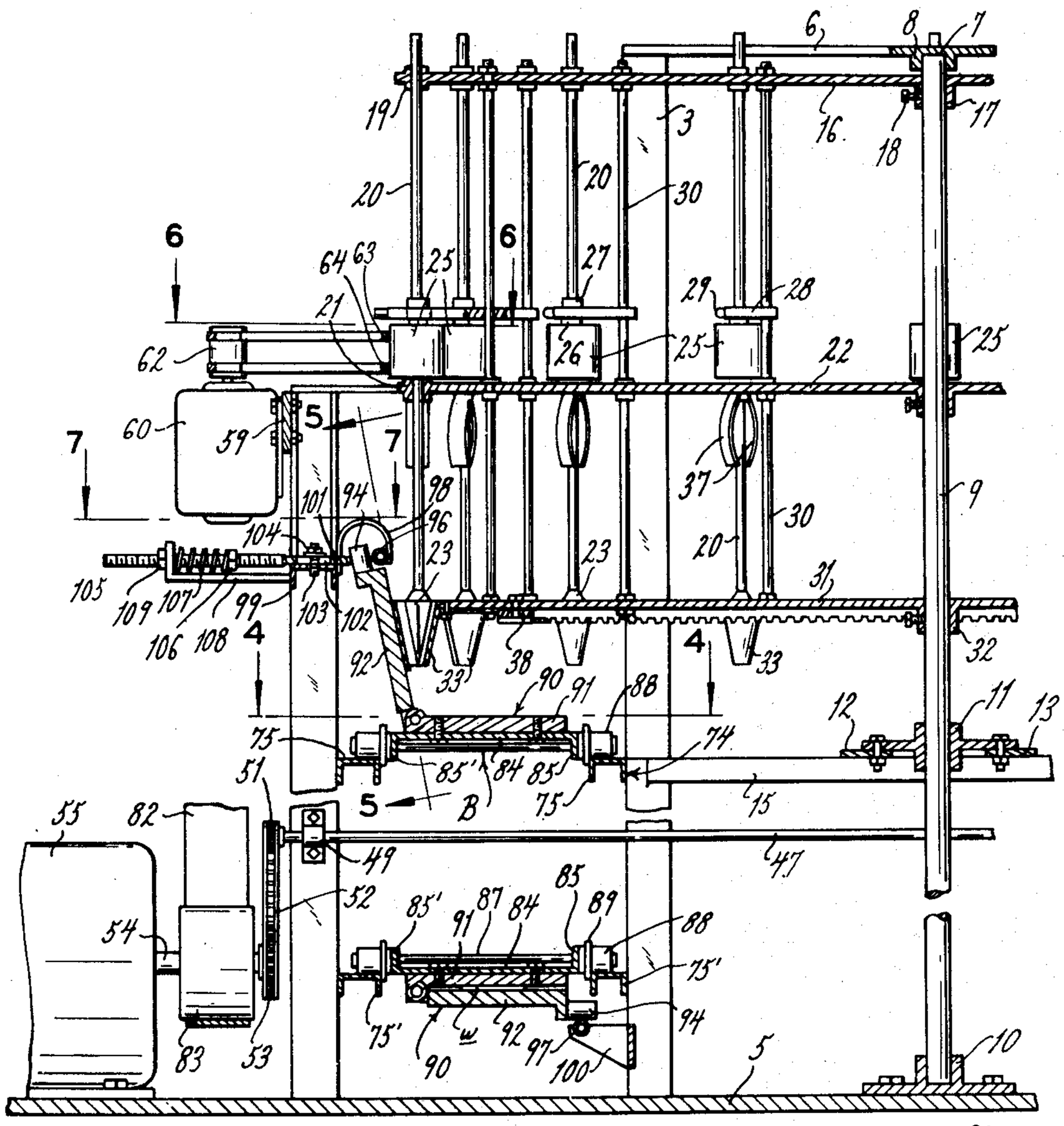

FIG. 3.

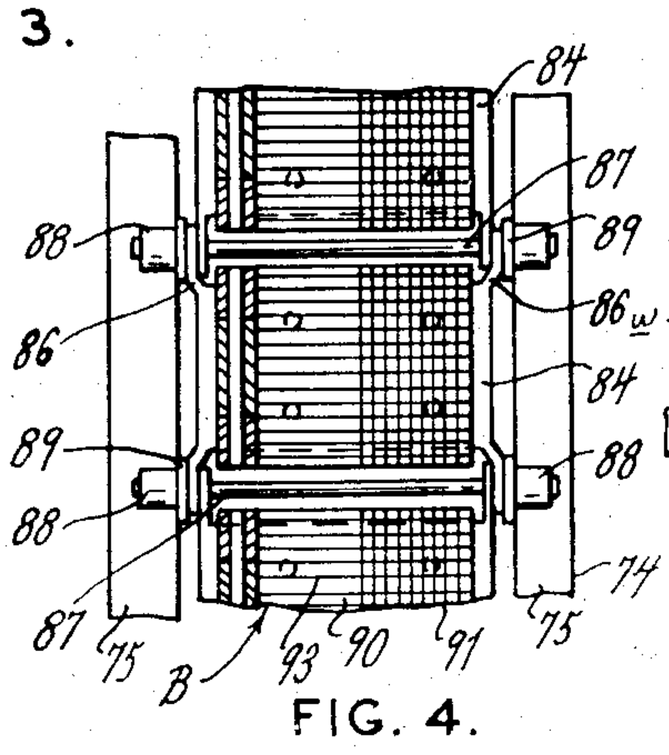

FIG. 4.

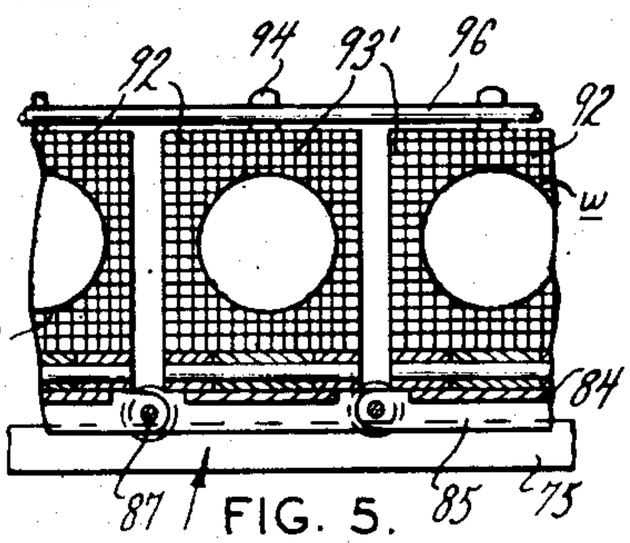

FIG. 5.

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ICE-CREAM CONE ROLLING MACHINE

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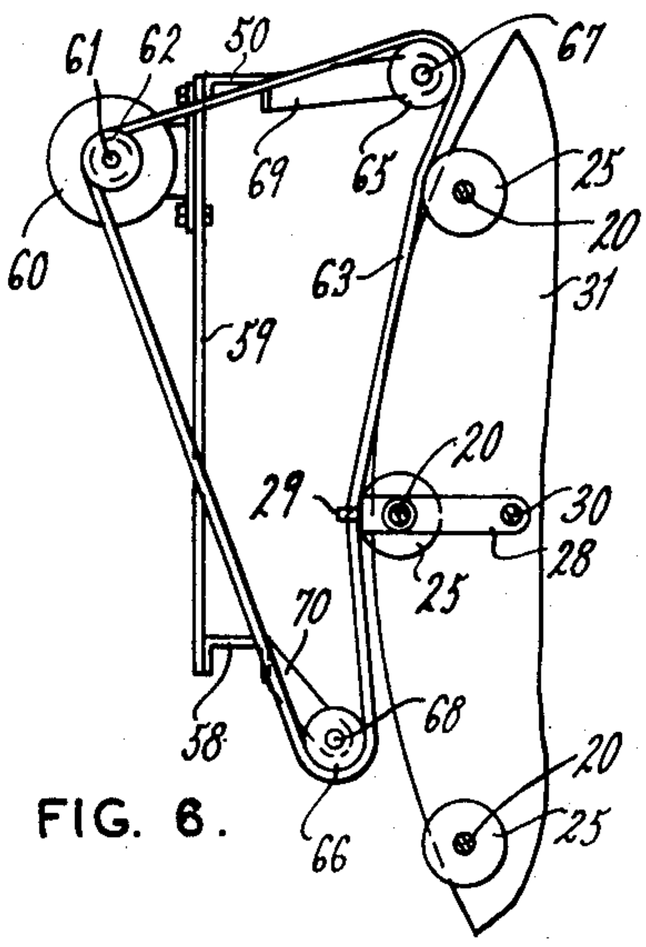

FIG. 6.

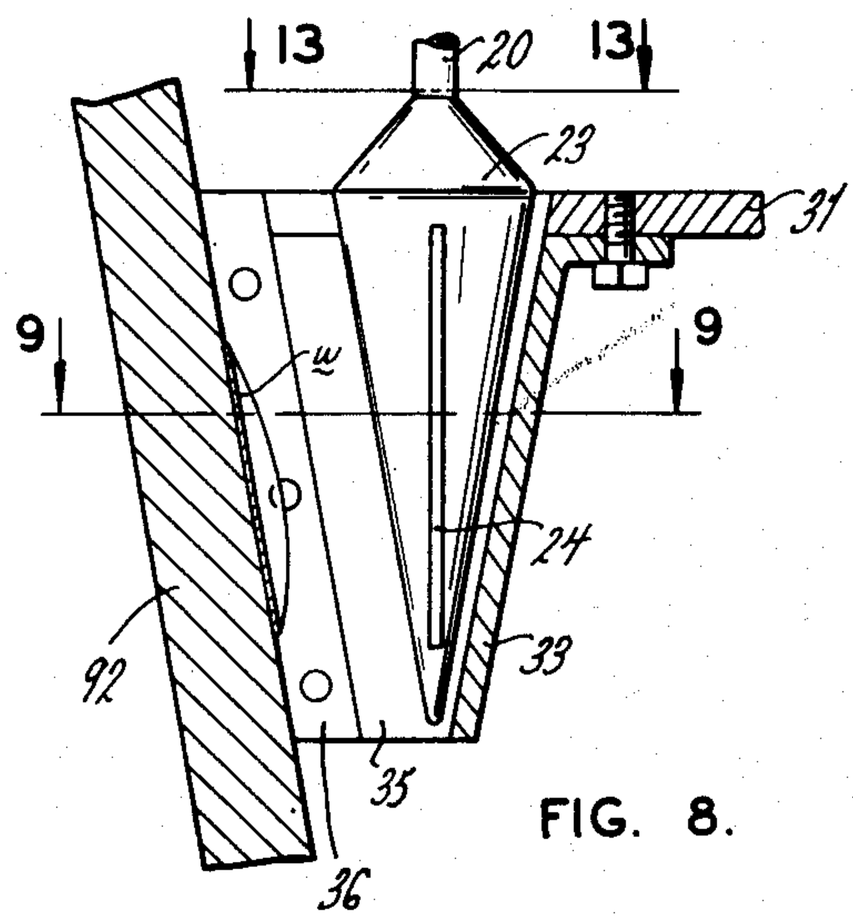

FIG. 8.

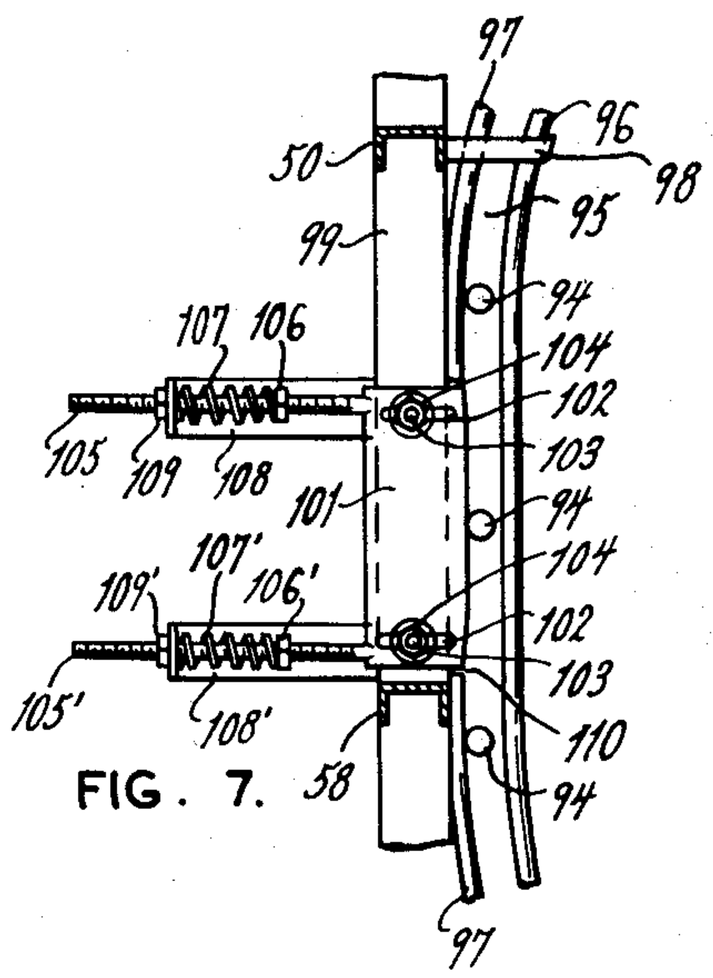

FIG. 7.

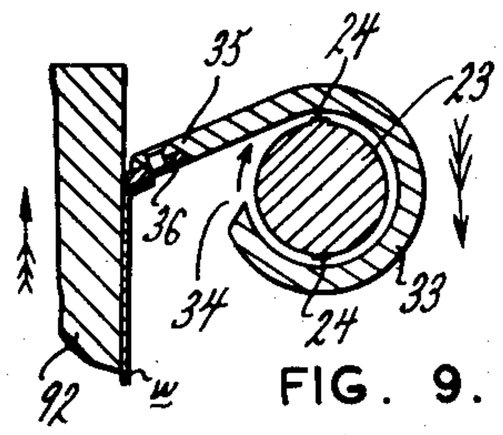

FIG. 9.

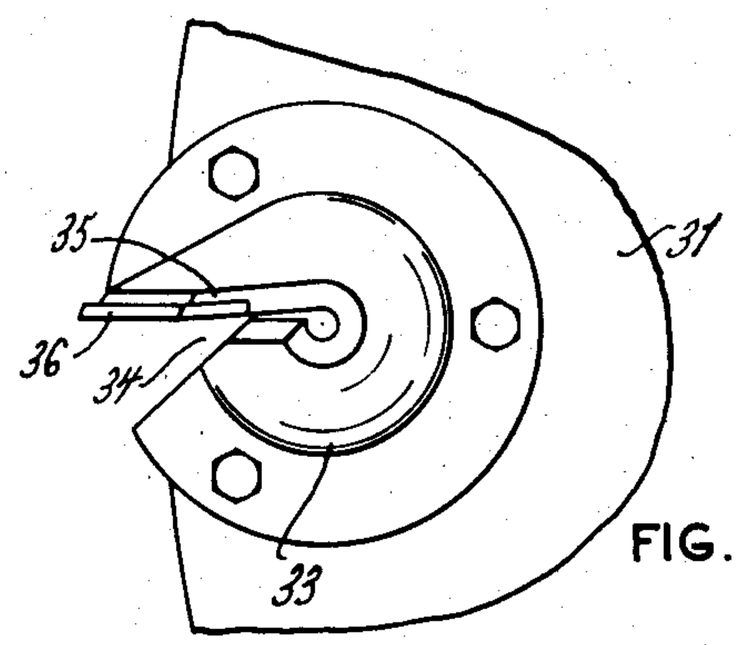

FIG. 12.

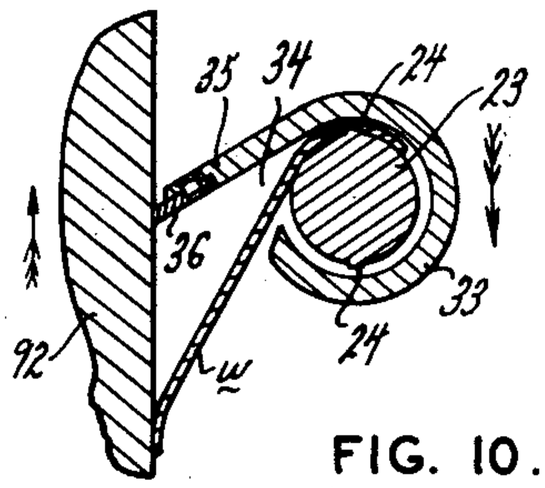

FIG. 10.

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ICE-CREAM CONE ROLLING MACHINE

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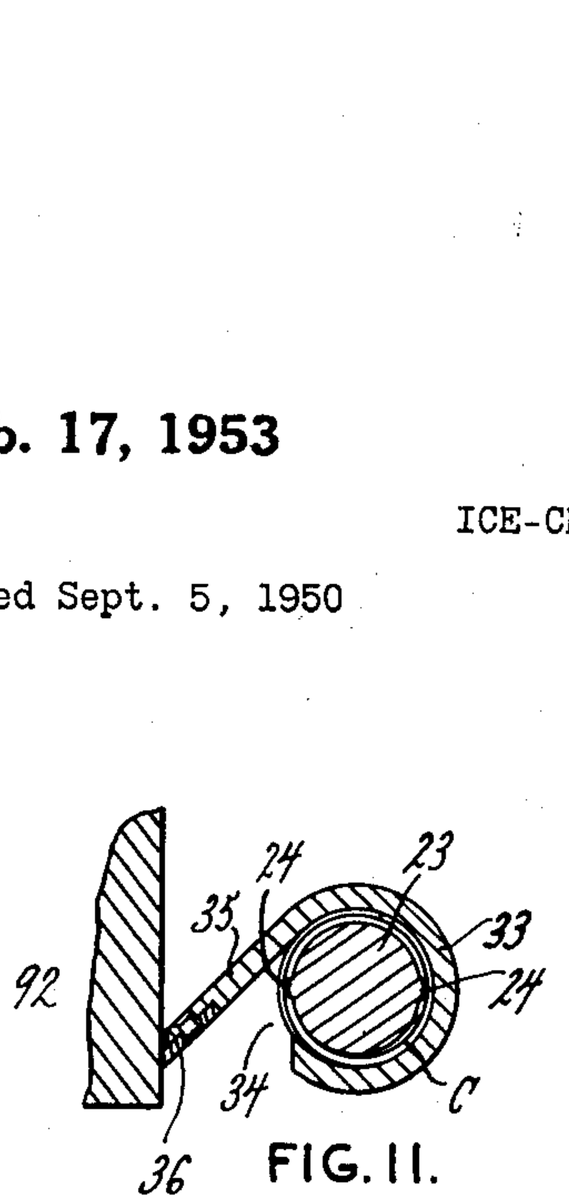

FIG. 11.

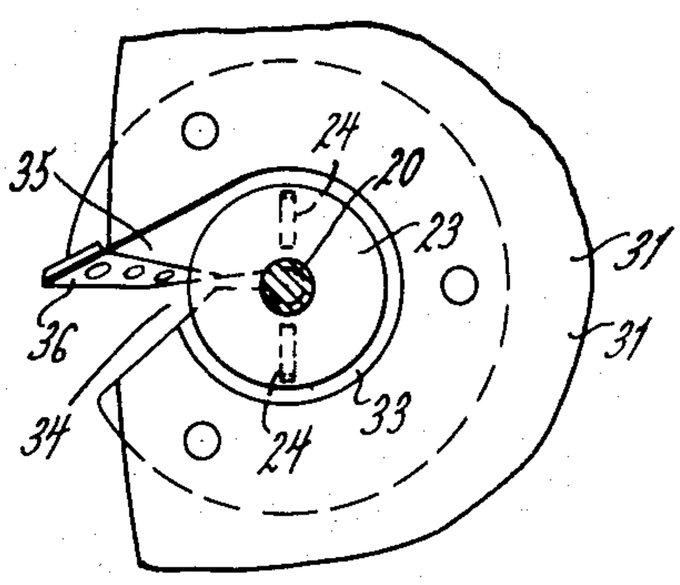

FIG. 13.

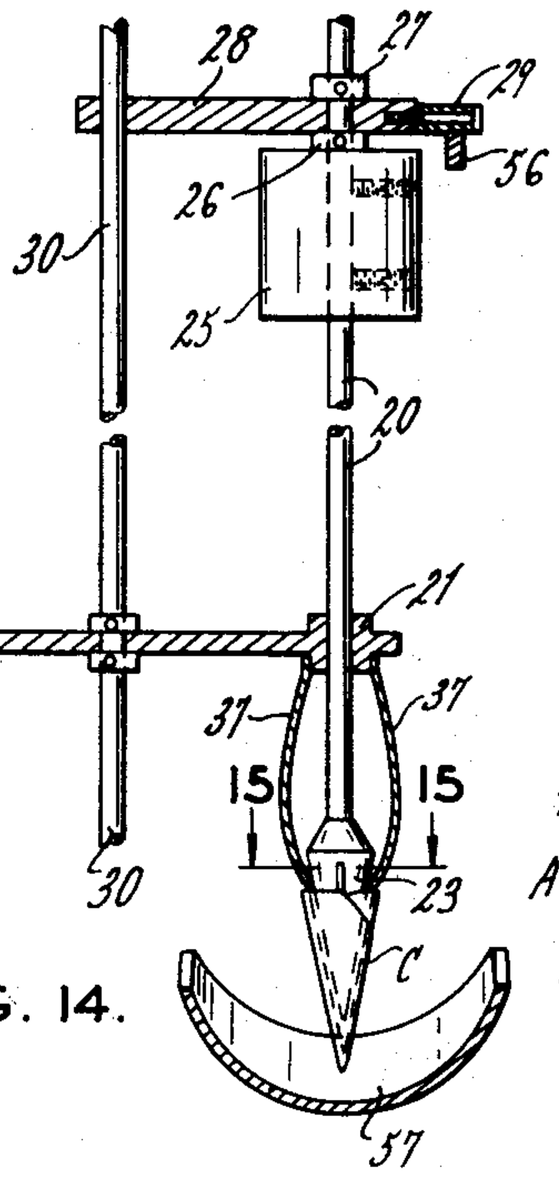

FIG. 14.

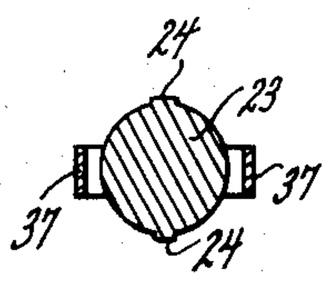

FIG. 15.

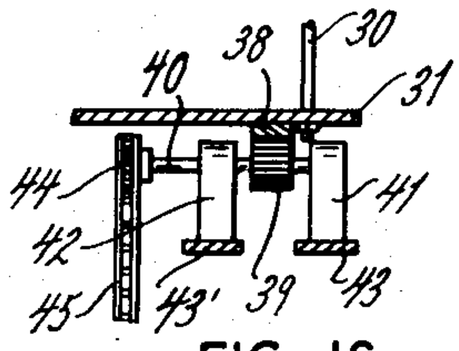

FIG. 16.

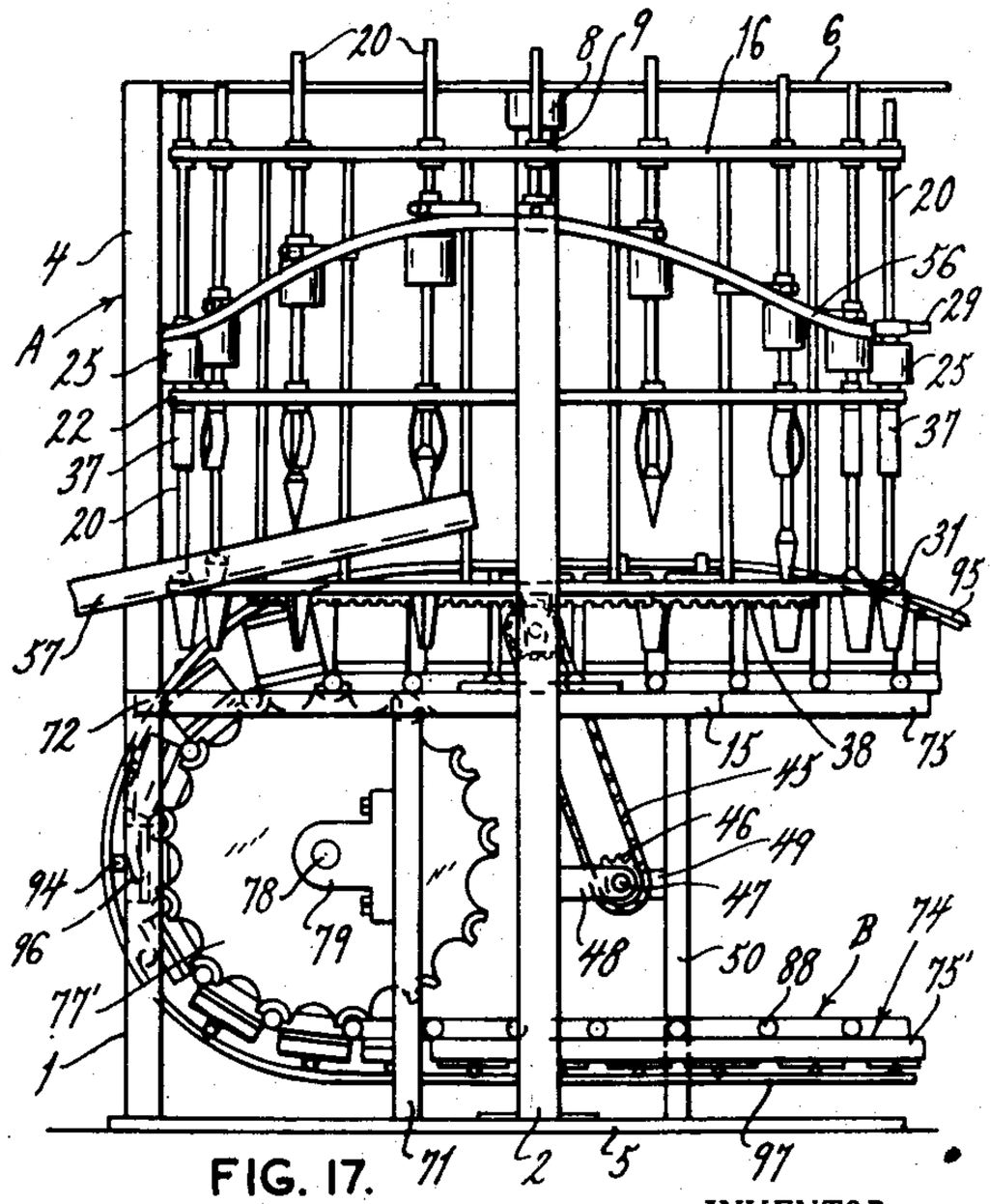

FIG. 17.

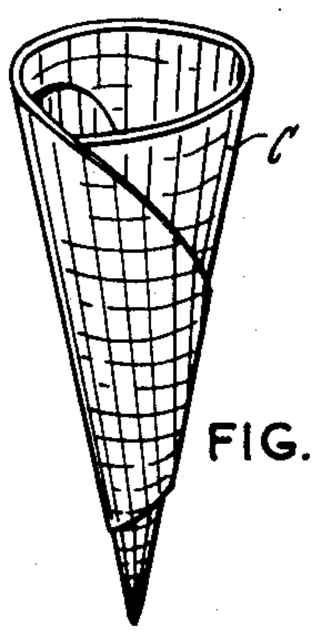

FIG. 18.

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Patented Feb. 17, 1953

2,628,576

UNITED STATES PATENT OFFICE

2,628,576

ICE-CREAM CONE ROLLING MACHINE

Jacob S. Finke, University City, Mo.

Application September 5, 1950, Serial No. 183,226

11 Claims. (Cl. 107—4)

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This invention relates to certain new and useful improvements in ice cream cone rolling machines.

The primary object of the present invention is to provide an ice cream cone rolling machine having wafer-conveying means incorporating two-part hinged griddles which permit continued baking of the wafers up to substantially the cone rolling stage, and unique means for opening the griddles at a predetermined point for removal of the wafer from the upwardly opening part thereof by a circularly traveling cone mold to which the conveyor moves in a substantially tangential path.

It is a further object of the present invention to provide a machine of the character stated which embodies means for applying positive pressure against the upwardly opening section of the griddles to assure complete lifting or scraping of the wafer therefrom by the cone mold.

An additional object of the present invention is to convey the open wafer-bearing surfaces of the baking grids in a substantially straight path tangential to and at the same angular inclination as the scraper edges on the rotating cone molds and in a direction linearly opposite to the direction of rotation of the molds at the point of tangency; and to provide resilient means for assuring scraping contact of such wafer-bearing surfaces against the scraper edges of the cone molds.

It is a still further object of the present invention to provide a machine of the character stated having a plurality of cone-rolling mandrels and cam means associated therewith for vertical reciprocal movement of the mandrels to effect stripping of cones rolled thereon.

With the above and other objects in view, my invention resides in the novel features of form, construction, arrangement, and combination of parts presently described and pointed out in the claims.

In the accompanying drawings, (four sheets)—

Figure 1 is a front view of an ice cream cone rolling machine constructed in accordance with and embodying the present invention;

Figure 2 is a transverse sectional view taken along line 2—2 of Figure 1;

Figure 3 is a fragmentary transverse sectional view taken along line 3—3 of Figure 1;

Figures 4, 5, 6, and 7 are fragmentary transverse sectional views taken along lines 4—4, 5—5, 6—6, and 7—7, respectively, of Figure 3;

Figure 8 is an enlarged detailed vertical sectional view of a cone molding element in the initial stage of the rolling operation;

Figure 9 is a transverse sectional view taken along line 9—9 of Figure 8;

Figures 10 and 11 are transverse sectional views taken substantially along line 9—9 of Figure 8 illustrating successive steps in the cone-rolling operation;

Figure 12 is a bottom view of the cone molding elements;

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Figure 13 is a top view of the cone molding elements taken along line 13—13 of Figure 8;

Figure 14 is a transverse sectional view taken along line 14—14 of Figure 2;

Figure 15 is a transverse sectional view taken along line 15—15 of Figure 14;

Figure 16 is a transverse sectional view taken along line 16—16 of Figure 2;

Figure 17 is a rear elevational view of the machine; and

Figure 18 is a perspective view of an ice cream cone rolled by the machine.

Referring now by reference characters to the drawings which illustrate a preferred embodiment of the present invention, A designates an ice cream cone rolling machine having a frame 1 comprised of preferably three main uprights 2, 3, 4, arranged in triangular relation, with the upright 3 being disposed slightly forwardly of the upright 4 (Figure 2). The lower ends of said uprights 2, 3, 4, are rigidly secured in a base plate 5. The uprights 3, 4, are connected at their upper ends by means of an angular frame member 6 having a downwardly opening bearing 7 integrally formed on the under surface of its elbow 8 for receiving the upper end of a vertical shaft 9, the lower end of which is journaled within a bearing 10 bolted to the base plate 5. Said shaft 9 is further supported for rotation, upwardly of its lower end, by a bearing 11 fixed to a pair of cross bars 12, 13, which are secured, as by welding, at their ends, and extending between, horizontal sections 14, 15, interconnecting the uprights 4, 2, and 3, 2, respectively.

Mounted at its center upon the shaft 9 for rotation therewith, adjacent the upper end thereof and beneath the frame member 6, is a circular plate 16 having a bearing collar 17 provided with a set screw 18 for securement upon the shaft 9. Radially arranged in the plate 16 adjacent its periphery are a plurality of spaced bearings 19 for receiving for rotary and sliding movement therethrough the upper ends of vertically disposed spindles 20, which extend downwardly and project through aligned slide bearings 21 in a second circular plate 22 disposed spacedly beneath the plate 16 and similarly engaged upon the shaft 9.

On the lower end of each of the spindles 20 there is fixed a cone-shaped mandrel 23 for the cone-rolling operation, as will be shown hereinafter. Each of said mandrels 23 has formed on its outer surface a pair of oppositely presented ridges or longitudinal projections 24. Firmly engaged on each spindle 20 above the plate 22, by means of set screws, is a drum member 25 above which is secured on each spindle 20 a pair of collars 26, 27, for maintaining therebetween a radially extending arm 28, the outer end of which projects outwardly beyond the drum 25 and mounts a cam follower roll 29. The inner end of each arm 28 is apertured for free vertical sliding movement along an associated rod 30. Said rods 30 are circumferentially disposed in radial align-

ment with the spindles 20, and are rigidly supported in and extend through suitable apertures in the plates 16, 22, with their lower ends engaged in aligned apertures in a circular mold-support plate 31, parallel to the plates 16, 22, and in lowered relation thereto. Said plate 31 is provided centrally with a support collar 32 for securement upon the shaft 9 upwardly of the bearing member 11.

Bolted to, and opening at, their upper ends in the plate 31 are a plurality of radially presented inverted cone-molds 33, each of which is co-axial with a mandrel 23. Each of said cone-molds 33 has a slot 34 therein at its outer side and extending from the rim down to the apex. It is essential that the slot extend a distance at least sufficient to accommodate the diameter of the generally circular wafers designated *w* which are to be rolled, as hereinafter referred to. It is also necessary that the slot extend to the cone apex, so that the rolled cones designated *c* may be formed with completed tips. Each cone further has a so-called loading flange 35 forming one side of the slot 34. Said flange 35 projects outwardly beyond the periphery of the plate 31 and has mounted at its outer edge, by rivets, a scraper blade 36, the outer face of which is flush with the adjacent surface of the flange 35.

Affixed, as by welding, at their upper ends to the under portion of each slide bearing 21 in the plate 22, and spaced from the associated spindle 20, is a pair of opposed generally concave stripper arms 37, the lower end of which are adapted for frictional engagement with the outer surface of the related mandrel 23 for stripping rolled cones therefrom, as will be presently described in detail.

Secured to, and depending from, the under face of the mold-support plate 31 is a circular rack 38 designed to mesh with and be driven by a gear 39, keyed or otherwise mounted upon a relatively short shaft 40 journaled in bearings 41, 42, supported on cross pieces 43, 43', respectively, secured at their ends to the horizontal sections 14, 15, adjacent the upright 2 and in parallel relation to the cross bars 12, 13. Engaged upon the shaft 40 is a sprocket wheel 44 driven by a downwardly extending drive chain 45 trained at its lower end about a sprocket 46 mounted adjacent the rearward end of a forwardly extending shaft 47 journaled in brackets 48, 49, respectively, secured to the upright 2 and a post member 50 presented adjacent the forward margin of the base plate 5. Mounted on the forward end of the shaft 47 is a sprocket 51 driven by a chain 52 which extends downwardly and laterally for engagement upon a sprocket wheel 53 secured on the end of the drive shaft 54 of an electric motor 55.

It will thus be seen that upon actuation of the motor 55 rotation will be imparted to the vertical shaft 9 through the gear 39 and the rack 38 thereby causing the plates 16, 22, and 31 to rotate in a counterclockwise manner and thus causing the cone molds 33 and their associated spindles 20 to move in a circular path.

Referring to Figures 1, 2, and 17, it will be seen that secured at one of its ends to the upright 4 is a cam or trackway 56 for co-operation with the follower rolls 29. Said trackway 56 progresses rearwardly along an arc substantially concentric with the plates 16, 22, 31, being of slightly greater radius and suitably supported adjacent its other end on the upright 2. Said trackway 56 is contoured to form a vertically

curved path with the highest point thereof being disposed just inwardly of the upright 2 with gentle downward inclinations on either side. Thus, upon rotation of the plates 16, 22, 31, the cam followers will encounter the trackway 56 after having passed the forward portion of the machine A and ride therealong with consequent upward sliding movement of the spindles 20 within the bearings 19, 21. The free sliding of the arm 28 upon the rods 30 permits smooth, reliable up and down movement of the spindles 20. Thus, with each revolution of the shaft 9, each mandrel 23 will be upwardly removed from its normal disposition within its associated mold 33 and be returned thereto. Referring to Figure 14, it will be seen that when a follower roll 29 has reached the peak of the trackway 56 the spindle 20 will have been raised sufficiently for the stripper arms 37 to come into contact with the outer face of the mandrels 23 for exerting pressure upon the upper margin of a cone C rolled thereon to strip same from adherence to the mandrel 23. Thereupon the cone C will drop downwardly into an inclined chute 57 suitably supported by means exterior to the machine A for conducting the cone C to a collector (not shown).

Aligned laterally, at the forward part of the machine A with the post 50 is a companion post member 58, said posts 50, 58, being interconnected at their upper ends by a horizontal bar 59 to the forward face of which is secured an auxiliary motor 60, having its drive shaft 61 vertically disposed with a double grooved pulley 62 engaged thereon. Supported upon the pulley 62 is a pair of drive belts 63, 64, which extend about horizontally spaced sheaves 65, 66, mounted for rotation upon stubs shafts 67, 68, respectively, disposed in laterally and rearwardly projecting arms 69, 70, respectively, rigidly fixed to the rearwardly presented faces of the posts 50, 58, respectively. The drive belts 63, 64, thus traverse a triangular path with the rearward leg thereof presented for frictional engagement with the drums 25 on the spindles 20 to impart rotation thereto. Upon actuation of the motor 60, which may preferably be connected to the same main switch as the motor 55, the spindles 20 will be caused to rotate while moving through that arc of their travel confronted by the drive belts 63, 64. Thus, for a predetermined period of time, the cone-rolling mandrels 23 will be actuated for cone-rolling operation through a defined portion of their total travel.

The means for conveying the wafer or cake to the machine A for cone-rolling purposes comprises sub-framing, which includes a relatively short vertical upright 71 laterally aligned with the upright 3, being forwardly and to the left, reference being had to the left hand side of Figure 2, of the upright 4 to which it is connected by a cross bar 72. Aligned forwardly with the upright 3 is a short post member 73 in lateral alignment with the posts 50, 58. Secured fixedly to the uprights 3, 71, and the posts 50, 58, 73, is a pair of vertically aligned, horizontally extending channel members, generally denoted 74, for forming upper and lower railways 75, 75', respectively, which extend at one end past the upright 3 and post 73 into a baking oven, generally designated 76, and at their other end terminate slightly beyond the upright 71, at which end the upper and lower railways 75, 75', are connected by a pair of sprocket wheels 77, 77', each being associated with one vertically aligned pair of

channel members 74. As may best be seen in Figures 2 and 3, the railways 75, 75', are in downward relation to the forward portion of the circular plate 31. Said sprocket wheels 77, 77', are mounted for rotation upon a shaft 78 journaled at its rearward end in a bearing 79 secured to one side face of the upright 71. The opposite end of the shaft 78 projects forwardly beyond the plane of the posts 50, 58, and is journaled in a bracket 80 mounted on the forward portion of the base plate 5. Engaged upon the shaft 78 adjacent its forward end is a fly wheel 81 driven by a belt 82 engaged about a pulley 83 mounted on the drive shaft 54 of the motor 55 (Figure 2). Within the interior of the oven 76 there are suitably provided sprocket wheels (not shown) similar in all respects to the sprocket wheels 77, 77', so that an endless or continuous conveyor, generally designated B, may be moved about the path created by the rails 75, 75'. It is to be noted in this regard that upon actuation of the motor 55 the fly wheel 81 will be rotated in a counter-clockwise manner so that the lower traverse of the conveyor B will be moving in an outwardly directed manner from the oven 76 with the upper traverse advancing thereinto.

The conveyor B is comprised of a plurality of rectangular metallic plates 84 having downwardly extending lateral flanges 85, 85', which extend at their ends beyond the end margins of the plates 84 (see Figure 4). On alternate plates 84, the projecting portions of the flanges 85, 85', are outwardly offset as at 86 for alignment with the projecting portion of the flanges of the adjacent plate 84 for registration of suitable apertures therein through which freely extends a hinge pin 87. On the opposite projecting ends of each hinge pin 87 there is mounted a roller 88 for movement along the railways 75, 75'. Each of said rollers 88 is integrally provided with a diametrally enlarged flange 89 for disposition intermediate the inwardly presented faces of the trackways 75, 75', and the adjacent projecting flanges 85, 85', of the plates 84 to maintain said plates 84 in alignment and prevent untoward displacement of the conveyor B upon the railways 75, 75'. With reference to Figure 17, it will be seen that the sprockets of the wheels 77, 77', are adapted to engage the rollers 88 for carrying same between the upper and lower railways 75, 75', respectively.

Bolted to the upper face of each of the plate sections 84 is the bottom plate 90 of a griddle member 91 having a cover or top plate 92 adapted for flatwise closure disposition upon the bottom plate 90 and being hingedly secured thereto for upward and forward opening swinging movement. The inner faces of the griddle plates 90, 92, are suitably provided with grids 93, 93', the grid 93' being more deeply cut to cause batter to adhere readily thereto so that upon opening of the griddle 91 the wafer or cake will be disposed upon the cover plate 92 (see Figure 5). Integrally formed with the cover plate 92 and on the normally rearwardly presented edge thereof is a projecting lug 94. For camming engagement with the lug 94 of each griddle member 91 is a guideway 95 comprising a pair of rod-members 96, 97, spaced from each other a distance slightly in excess of the diameter of the lug 94 and following, at the front of the machine A, a path which extends upwardly and forwardly from a point adjacent the upright 3 and the rearward member of the upper railway 75 to approximately the post 50 and thence adjacent to and parallel with the plane of the posts 50, 58, and then rearwardly and downwardly in overlying relation to the sprocket wheels 77. The rod-like member 96 is of suitable length to complete the above-described path, being supported centrally by a hanger member 98 secured to the inner face of a cross bar 99 affixed at its ends to and extending between the posts 50, 58, in downwardly spaced, parallel relation to the member 59. The other rod-like member 97 continues at its outer end beyond the path stated above to extend beneath and parallel to the rearward member of the lower railway 75', throughout its entire length, for continuous engagement with the lugs 94 of the griddles 91 to prevent inadvertent opening of the cover plates 92 through gravity when the griddles 91 move along the lower traverse of the conveyor B (Figures 1, 2, 3, and 17). Supporting the lower section of the rod-like member 97 are brackets 100 welded to the uprights 71, 3.

Disposed upon the upper face of the cross bar 99 between the posts 50, 58, is a relatively short angle section 101 provided in its upper surface, adjacent each of its ends, with slots 102 through each of which upwardly projects for relative movement therewith bolts 103 fixed at their lower ends in the cross bar 99 and having nuts 104 threadedly engaged on their upper projecting ends. Projecting forwardly from the upper surface of the plate 101 and welded thereto are spaced rods 105, 105', having fixed thereon nuts 106, 106', to provide bearing surfaces for compression springs 107, 107', respectively, encirclingly disposed about the rods 105, 105', and bearing at their forward ends against the vertical legs of angle strips 108, 108', suitably secured to the cross bar 99. Engaged upon the rods 105, 105', forwardly of the vertical portions of the angle strips 108, 108', for abutment thereagainst are lock nuts 109, 109', which permit adjustment of the angle section 101 with relation to the cross bar 99. The rearwardly presented face of the section 101 extends into a gap 110 provided in the rod-like member 97 for extension into the guideway 95 for abutment against the lugs 94 of the cover plates 92 of the griddles 91 as same are moved thereby, for reasons which will be more fully set forth hereinafter. Thus, the section 101 is adjusted for yieldably providing the desired pressure upon the cover plates 92.

Disposed adjacent the upright 3, being suitably supported by a bracket 111 affixed to the side face of the rearward channel member 74 of the upper railway 75 is a batter-discharge tube 112 connected to a source of prepared batter (not shown) and having its outlet end 113 poised in elevated relation to the conveyor B for the emission of measured quantities of the batter upon the lower plates 90 of the griddles 91 as same move thereunder. The batter thus discharged will through normal spreading assume a circular shape upon the lower plate 90 of the griddle 91 to form a wafer or cake *w*.

The operation of the machine A is as follows: The motor 55 is actuated to cause the plates 16, 22, 31, to rotate in a counter-clockwise manner, as stated above, and to effect movement of the conveyor B for continuous progression about the railways 75, 75', moving outwardly on its lower traverse from the oven 76 and being brought in a direction toward the said oven 76 on its upper traverse. It will be seen that the griddles 91 proceeding along the lower railway 75' are closed, being maintained closed by engagement of the

lugs 94 upon the rod-like member 97 for continuing the baking of the wafers *w* contained therein, as the griddles 91 retain substantial quantities of heat absorbed during the movement through the oven 76. As the griddles 91 approach the sprockets 77, 77', the lug 94 will follow the rod-like member 97 and thus be led forwardly by the guideway 95 which, by its upwardly extending path, causes the top plate 92 to be raised from the lower plate 90, thereby opening the griddles 91, with maximum opening attained along that portion of the guideway 95 which is immediately adjacent the posts 50, 58, as may be seen in Figure 3. The wafer *w* will adhere to the grid 93' of the top plate 92 since the same is coarser than the lower grid 93 and, hence, tends to become embedded within the wafer *w*. Referring to Figure 3, it will be seen that when the top plate 92 is in maximum open position the lug 94 will abut on its normally upper surface against the plate 101 which effects a pressure thereon to prevent untoward swinging movement of the plate 92 as the scraper 36 of a cone mold 33 comes into contact with the grid 93' for lifting the wafer *w* therefrom and causing same to move along the loading flange 35 and into the main cavity of the mold 33 (see Figures 9, 10, and 11). Thus, any outwardly directed thrust exerted upon the plate 92 of the griddle 91 by the cone mold 33 during wafer removing action will be positively countered by the force exerted by the plate 101 to assure clean and complete transference of the wafer *w* to the cone mold 33. Within the mold 33 the wafer *w* will become wound about the revolving mandrel 23 associated with the particular mold 33 for rolling same into cone formation, the ridges 24 tending to protrude slightly into the wafer *w* for maintaining same securely upon the mandrel 23. Rotation of the said mandrel 23 within the mold 33 is produced through coaction of the drum 25 upon its spindle 20 and the belts 63, 64, associated with the now actuated motor 60. As the spindle 20, upon which the particular mandrel 23 now being described is mounted, is moved beyond the sheave 66, engagement will be lost between the drum 25 and the belts 63, 64, whereupon revolution of the mandrel 23 will be terminated. Thus, the cone C rolled upon the mandrel 23 is permitted to set until discharged into the chute 57 by the stripper arms 37 when the associated follower roll 29 has reached the highest point of the trackway 56, described hereinabove. Thereafter the mandrel 23 will be continued in its counter-clockwise path for ultimate repetition of the cyclical operation.

The particular timing requisite in the operation of the machine A is to be noted in that the shaft 9 must be rotated at such a speed with relation to the rate of travel of the conveyor B to assure proper coincidence of a cone mold 33 and the fully opened top plate 92 of a griddle 91 at a point immediately adjacent the plate 101 for effective removal of the wafer *w*. Simultaneous with this meeting of the mold 33 and the top plate 92 the spindle 20 of the mandrel 23 associated with the said mold 33 must be rotating at its maximum designed rate to assure complete rolling of the wafer *w* into cone formation before contact is lost between the associated drum 25 and the belts 63, 64. Consequently, it is requisite that the said associated drum 25 be brought into engagement with the belts 63, 64, a sufficient time prior to the cone-rolling operation to overcome the normal inertia, and cause the spindle 20 to start rotation.

Subsequent to the wafer scraping operation the griddles 91 continue along the upper traverse of the conveyor B with the lug 94 riding now downwardly along the guideway 95 into progressively closing relationship with the lower plate 90. Just prior to the complete closing of the griddle 91 there will be discharged upon the lower plate 90 a pre-measured quantity of batter sufficient to form a wafer *w*. Immediately thereafter the griddle 91 will be completely closed and remain so through gravity as it is moved into and through the oven 76 where the baking of the wafer *w* is initiated. As stated hereinabove, the absorption of heat by the griddles 91 permits the baking of the wafer *w* to be continued while the conveyor B moves along its lower traverse so that minimum time is passed in the oven 76 and the wafers *w* are presented in a fully baked, warm, pliable condition for removal by the scrapers 36.

Previous attempts at mechanical transference of wafers from grids into cone molds have uniformly failed. While not heretofore known, the cause of failure included inadequate contact and travel as between scrapers and grids, and slowness in transferring the wafer as well as in the rolling operation. To overcome the problem of slowness, the machine A rotates the mandrel 23 so fast that, upon being first contacted by the edges of the wafers *w* being removed, they seize and lift them from the top grid plates 92, as shown in Figure 10. To permit the wafers *w* to be so lifted and drawn into the molds 23 without interference from the edges of the slots 34, opposite the loading flanges 35, the width of the slots 34 is increased as the diameter of the cone cross section increases, thus providing the necessary clearance. The spinning is completed before the wafers have cooled or lost their adherency. To assure adequate contact and relative travel between the scrapers and grids, the center of rotation of the spindles 20 is about a vertical axis in perpendicular relation to the upper path of the conveyor B so that, at the moment of scraping of each wafer *w* from its top plate 92, the said plate 92 is following a course tangential to that of the cone mold 33 and in a direction directly opposite. The thrust exerted by the plate 101 assures full contact during the travel of a cone mold 33 through an arc which, though small, assures the positive removal of the wafers from the grids.

It is to be further noted that the machine A requires no manual operations whatever. In contrast, other currently used cone rolling machines require operators to deliver batter to the grids and, more seriously, to remove the hot baked wafers from the grids and feed them manually into cone-forming molds. If they are permitted to cool, the cones will not adhere. Handling such hot wafers results in burns to the operator's hands; it is not possible for a person to do this work continuously for more than an hour or so at a time. Further, such operators must be experienced and skilled at feeding the wafers into the molds. But with the machine above described, the operation is entirely automatic.

It should be understood that changes and modifications in the form, construction, arrangement, and combinations of the several parts of the ice cream cone rolling machine may be made and substituted for those herein shown and described without departing from the nature and principle of the present invention.

For purposes of the claims, neither the phrase "wafer-rolling means" nor the phrase "wafer-

bearing grids" is to be interpreted as including wafers, the wafers themselves being not parts of the claimed machine. "Wafer-bearing grids" is defined merely as meaning "grids adapted to bear wafers."

I claim:

1. A cone rolling machine comprising a mold-carrying plate, means for rotating said plate in a substantially horizontal plane, a plurality of spaced radially presented cone molds secured to said plate adjacent the periphery thereof, a cone-rolling mandrel associated with each of said molds and normally in registration therewith, means for intermittently rotating said mandrels within the cone molds, an endless conveyor adapted to move in a path substantially perpendicular to a radial line from the axis of rotation of the mold-carrying plate and being disposed for movement therebeneath, a plurality of wafer-carrying griddles mounted on said conveyor, each of said griddles having a bottom plate and an upper plate hingedly mounted thereon, the upper plate having a grid inscribed on its inner surface for receiving the wafer, and means associated with the conveyor for causing the upper plate of the griddles to be moved into open position for scraping contact by a cone mold with the grid thereon to cause transference of the wafer from the griddle and into the mold for cone-forming operation by the mandrel.

2. A cone rolling machine having a mold-carrying plate, means for rotating said plate in a substantially horizontal plane, a plurality of radially presented cone molds secured to said mold-carrying plate adjacent the periphery thereof and depending from the under surface thereof, each of said molds having a feed slot and a loading flange forming one side of said slot and extending outwardly beyond the circumferential face of the plate, a cone rolling mandrel associated with each of said molds and normally in registration therewith, means for intermittently rotating said mandrel within the mold for cone-forming operation, an endless conveyor adapted for movement beneath said cone mold-carrying plate in a direction substantially normal to a radial line from the center of rotation thereof, a plurality of wafer-carrying griddle members mounted upon said conveyor, each of said griddles having a swingable top plate provided with a grid upon its inner surface for embedding therein of a wafer, means associated with said conveyor for causing the top plates of the griddles to be swung into open position at a predetermined point for scraping engagement therewith by the loading flange of a cone mold in order to effect transference of the wafer into said mold, and means for exerting a pressure upon the normally outer face of the top plate at the moment of scraping action to maintain same in positive engagement with the cone mold for clean and complete removal of the wafer.

3. In a cone-rolling machine, the combination comprising a rotary frame, a plurality of cone molds carried thereby, the axes of the molds being parallel to and equidistant from the axis of rotation of the frame, wafer-rolling means associated with the molds, each mold having a feed slot extending from its apex through and along its wall, and having a portion adjacent the slot presented as a scraper, a conveyor, baking grids conveyed thereon along a path substantially tangential to the path of rotation of said scraper portions, whereby said grids are presented in position for scraping engagement against the

scraper portions of the successive molds to remove baked wafers therefrom, and mechanism operatively associated with the frame and the conveyor for rotating the frame in one direction and simultaneously moving the grids tangentially of said scraper portions in the opposite direction, whereby wafers are scraped from said grids and delivered through the feed slots into the cone molds for rolling by the wafer-rolling means.

4. In a cone-rolling machine, the combination comprising a rotary frame, a plurality of cone molds carried thereby, the axes of the molds being parallel to and equidistant from the axis of rotation of the frame, wafer-rolling means associated with the molds, said means including mandrels rotatable on the mold axes, each mold having a feed slot extending from its apex through and along its wall, and having a portion adjacent the slot presented as a scraper, a conveyor, wafer-bearing grids conveyed thereon along a path substantially tangential to the path of rotation of said scraper portions, whereby said grids are presented in position for scraping engagement against the scraper portions of the successive molds to remove baked wafers therefrom, and mechanism operatively associated with the frame and the conveyor for rotating the frame in one direction and simultaneously moving the wafer-bearing grids tangentially of said scraper portions in the opposite direction, whereby wafers are scraped from said grids and delivered through the feed slots into the cone molds for rolling by the wafer-rolling means.

5. In a cone-rolling machine, the combination comprising a rotary frame, a plurality of cone molds carried thereby, the axes of the molds being angularly disposed with reference to a plane normal to the axis of rotation of the frame, wafer-rolling means associated with the molds, each mold having a feed slot extending from its apex through and along its wall, and having a portion adjacent the slot presented outwardly as a scraper, a conveyor, wafer-bearing grids conveyed thereon along a path substantially tangential to the path of rotation of said scraper portions, whereby said grids are presented in position for scraping engagement against the scraper portions of the successive molds to remove baked wafers therefrom, and mechanism operatively associated with the frame and the conveyor for rotating the frame in one direction and simultaneously moving the wafer-bearing grids tangentially of said scraper portions in the opposite direction, whereby wafers are scraped from said grids and delivered through the feed slots into the cone molds for rolling by the wafer-rolling means.

6. In a cone-rolling machine, the combination comprising a rotary frame, a plurality of cone molds carried thereby, the axes of the molds being parallel to and equidistant from the axis of rotation of the frame, wafer-rolling means associated with the molds, each mold having a feed slot extending from its apex through and along its wall, and having a scraper edge presented outwardly from the feed slot, a conveyor, wafer-bearing grids conveyed thereon along a path substantially tangential to the path of rotation of said scraper edges, whereby said grids are presented in position for scraping engagement against the scraper edges of the successive molds to remove baked wafers therefrom, and mechanism operatively associated with the frame and the conveyor for rotating the frame in one di-

rection and simultaneously moving the wafer-bearing grids tangentially of said scraper edges in the opposite direction, whereby wafers are scraped from said grids and delivered through the feed slots into the cone molds for rolling by the wafer-rolling means.

7. In a cone-rolling machine, the combination comprising a rotary frame, a plurality of cone molds carried thereby, the axes of the molds being parallel to and equidistant from the axis of rotation of the frame, wafer-rolling means associated with the molds, each mold having a feed slot extending from its apex through and along its wall, and having a portion adjacent the slot presented as a scraper, a conveyor, wafer-bearing grids conveyed thereon to an inclined position in angular alignment with said scraper portions and substantially tangential to their path of rotation, whereby said grids are presented in position for scraping engagement against the scraper portions of the successive molds to remove baked wafers therefrom, and mechanism operatively associated with the frame and the conveyor for rotating the frame in one direction and simultaneously moving the wafer-bearing grids tangentially of said scraper portions in the opposite direction, whereby wafers are scraped from said grids and delivered through the feed slots into the cone molds for rolling by the wafer-rolling means.

8. In a cone rolling machine, the combination comprising a rotary frame, a plurality of cone molds carried thereby, the axes of the molds being angularly disposed with reference to a plane normal to the axis of rotation of the frame, wafer-rolling means associated with the molds, each mold having a feed slot extending from its apex through and along its wall, and having a portion adjacent the slot presented outwardly as a scraper, a conveyor, hinged wafer-bearing grids conveyed thereon, means for opening the hinged grids and presenting the wafer-bearing surfaces in inclined position along a path substantially tangential to the path of rotation of said scraper portions and in position for scraping engagement against the scraper portions of successive molds to remove baked wafers from said grids, and mechanism operatively associated with the frame and the conveyor for rotating the frame in one direction and simultaneously moving the wafer-bearing grids tangentially of said scraper portions in the opposite direction, whereby wafers are scraped from said grids and delivered through the feed slots into the cone molds for rolling by the wafer-rolling means.

9. In a cone-rolling machine, the combination comprising a rotary frame, a plurality of cone molds carried thereby, the axes of the molds being parallel to and equidistant from the axis of rotation of the frame, wafer-rolling means associated with the molds, each mold having a feed slot extending from its apex through and along its wall, and having a portion adjacent the slot presented as a scraper, a conveyor, wafer-bearing grids conveyed thereon along a path substantially tangential to the path of rotation of said scraper portions, whereby said grids are presented in position for scraping engagement against the scraper portions of the successive molds to remove baked wafers therefrom, a resilient segment in said conveyor in the region of tangency of said grids and scraper portions, and mechanism operatively associated with the frame and the conveyor for rotating the frame in one direction and simultaneously moving the

wafer-bearing grids tangentially of said scraper portions in the opposite direction, whereby wafers are scraped from said grids and delivered through the feed slots into the cone molds for rolling by the wafer-rolling means.

10. In a cone-rolling machine, the combination comprising a rotary frame, a plurality of cone molds carried thereby, the axes of the molds being angularly disposed with reference to a plane normal to the axis of rotation of the frame, wafer-rolling means associated with the molds, each mold having a feed slot extending from its apex through and along its wall, and having a portion adjacent the slot presented outwardly as a scraper, a conveyor, wafer-bearing grids conveyed thereon along a path substantially tangential to the path of rotation of said scraper portions, whereby said grids are presented in position for scraping engagement against the scraper portions of the successive molds to remove baked wafers therefrom, a resilient segment in said conveyor in the region of tangency of said grids and scraper portions adapted for urging the successive wafer-bearing grids into tight scraping engagement against the scraper portions, and mechanism operatively associated with the frame and the conveyor for rotating the frame in one direction and simultaneously moving the wafer-bearing grids tangentially of said scraper portions in the opposite direction, whereby wafers are scraped from said grids and delivered through the feed slots into the cone molds for rolling by the wafer-rolling means.

11. In a cone-rolling machine, the combination comprising a rotary frame, a plurality of cone molds carried thereby, the axes of the molds being angularly disposed with reference to a plane normal to the axis of rotation of the frame, wafer-rolling means associated with the molds, each mold having a feed slot extending from its apex through and along its wall, and having a portion adjacent the slot presented outwardly as a scraper, a conveyor, hinged wafer-bearing grids conveyed thereon, means for opening the hinged grids and presenting the wafer-bearing surfaces in inclined position along a path substantially tangential to the path of rotation of said scraper portions and in position for scraping engagement against the scraper portions of successive molds to remove baked wafers therefrom, a resilient segment in the track of said conveyor in the region of tangency of said grids and scraper portions, and mechanism operatively associated with the frame and the conveyor for rotating the frame in one direction and simultaneously moving the wafer-bearing grids tangentially of said scraper portions in the opposite direction, whereby wafers are scraped from said grids and delivered through the feed slots into the cone molds for rolling by the wafer-rolling means.

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