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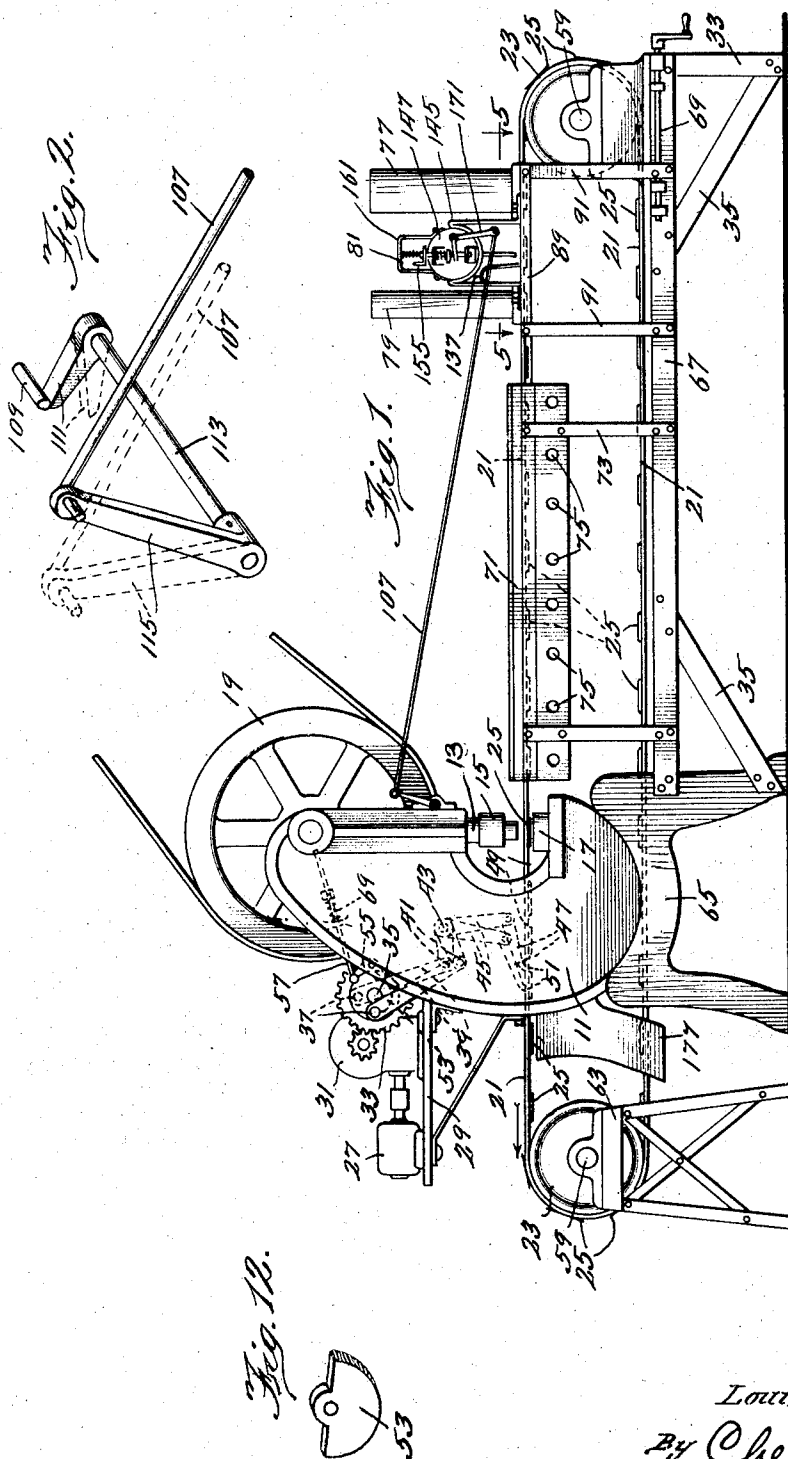
L. T. FREDERICK

1,782,989

METHOD AND APPARATUS FOR FEEDING DISKS TO A CLOSING MOLD

Filed Jan. 18, 1928

6 Sheets-Sheet 1



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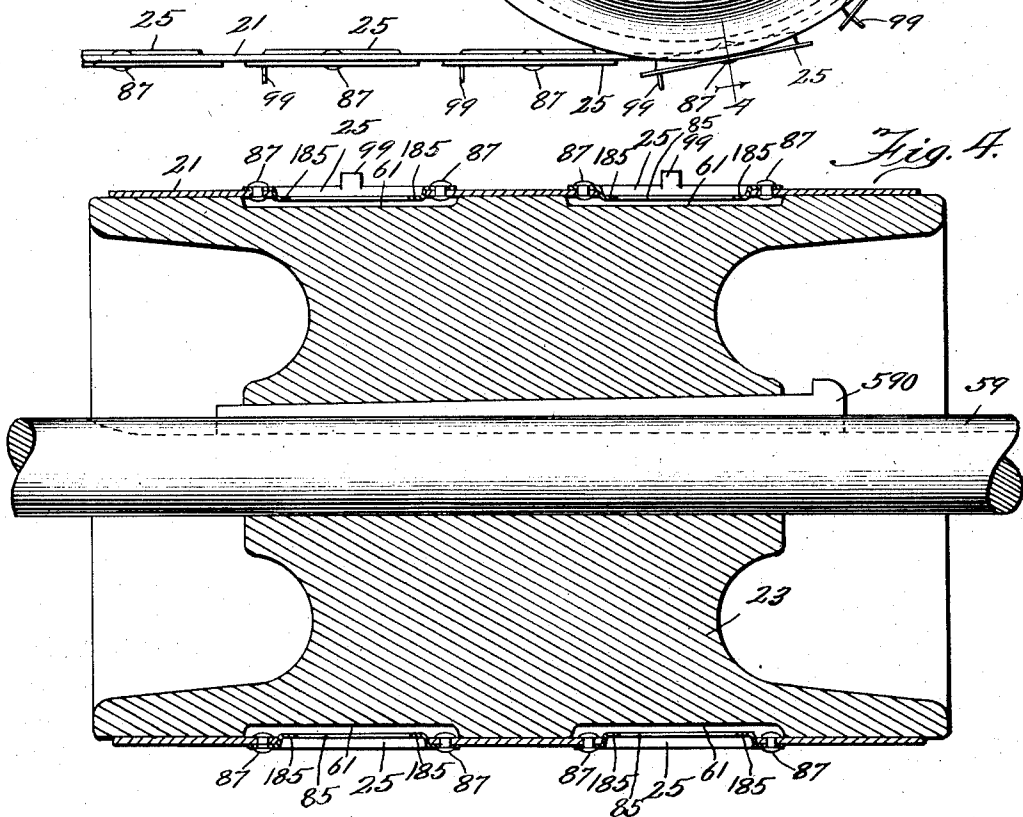
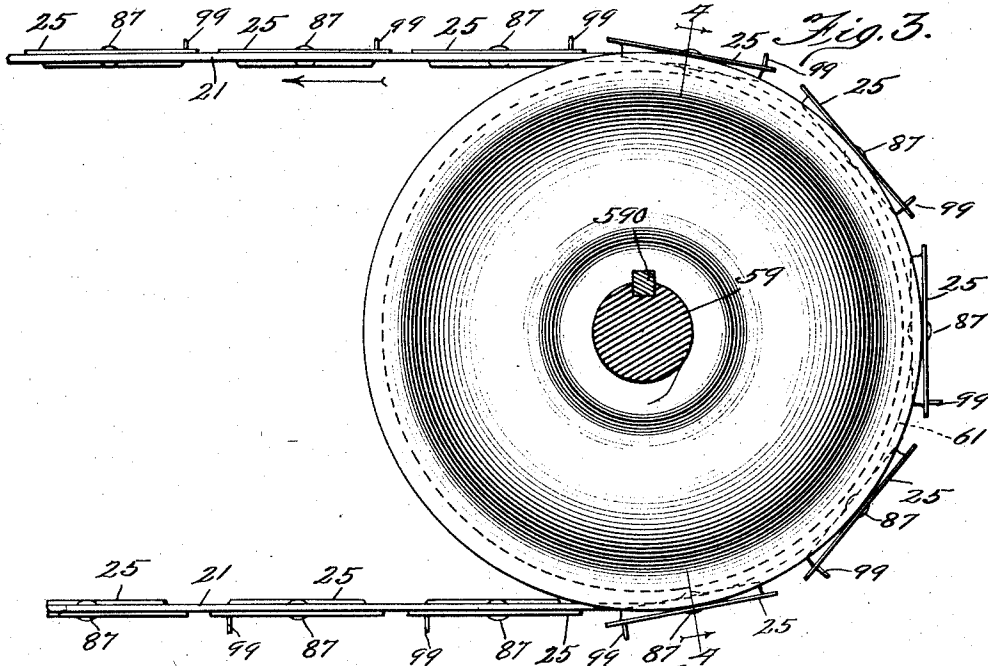
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6 Sheets-Sheet 2



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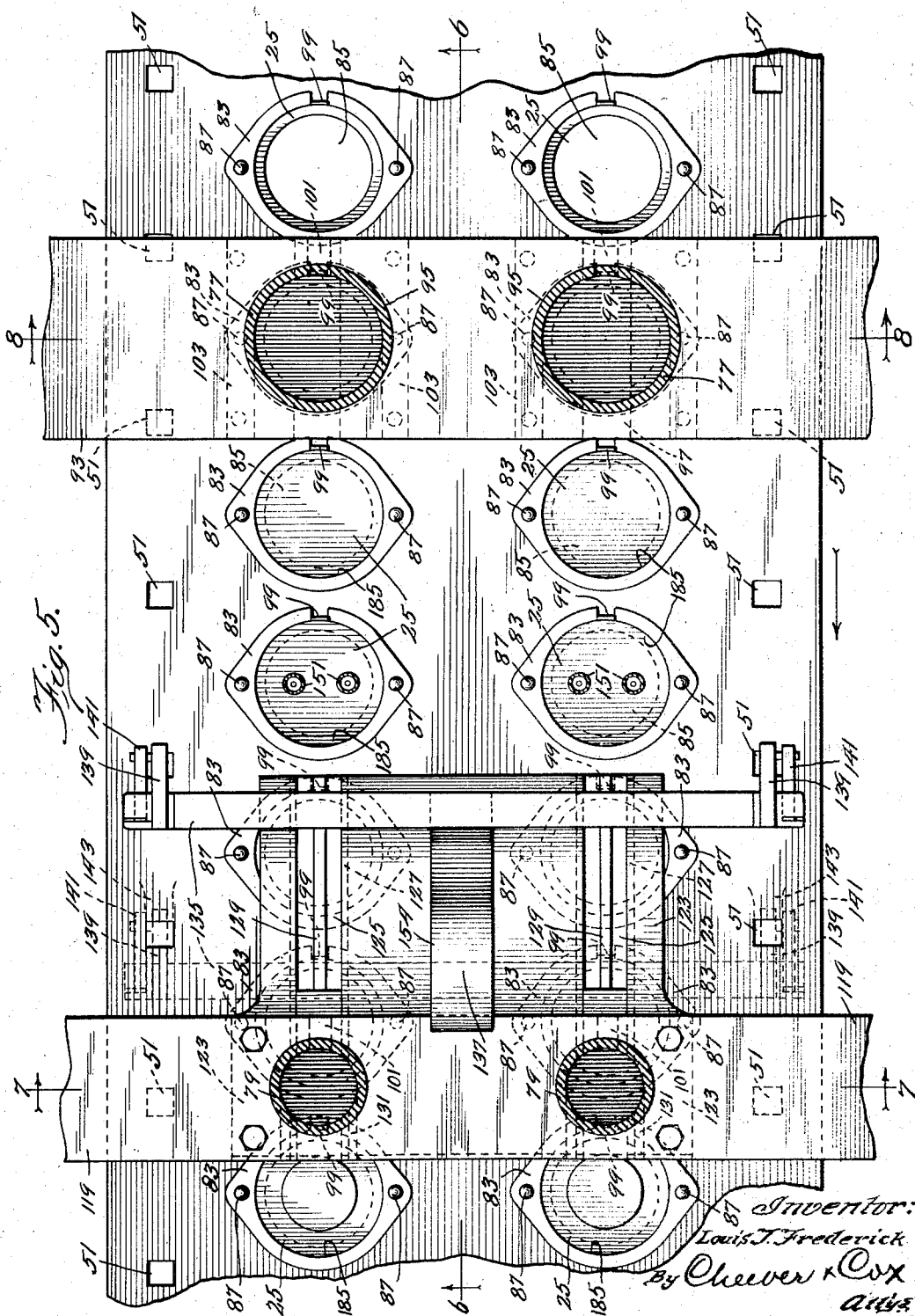
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METHOD AND APPARATUS FOR FEEDING DISKS TO A CLOSING MOLD

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6 Sheets-Sheet 3



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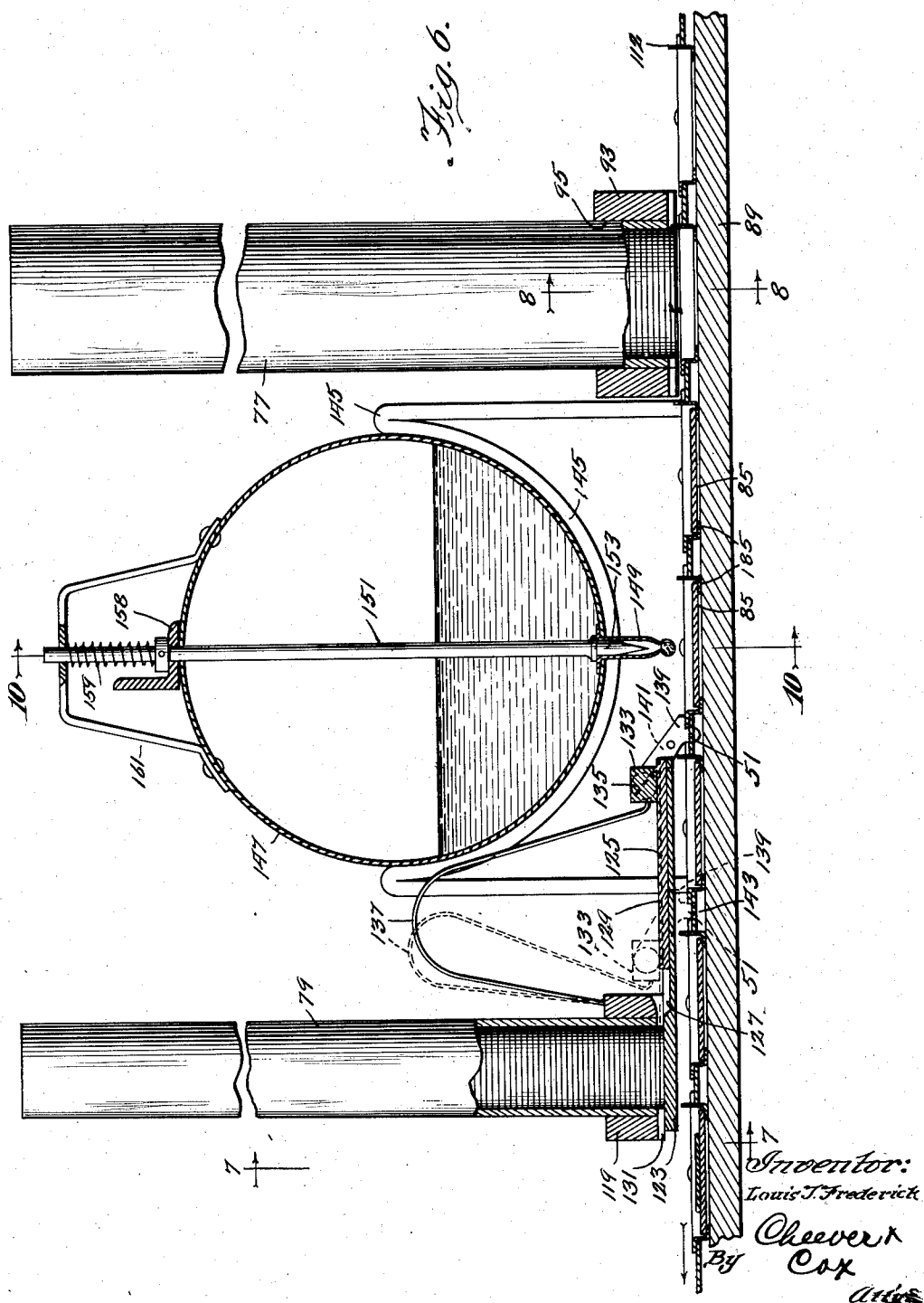
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6 Sheets-Sheet 5

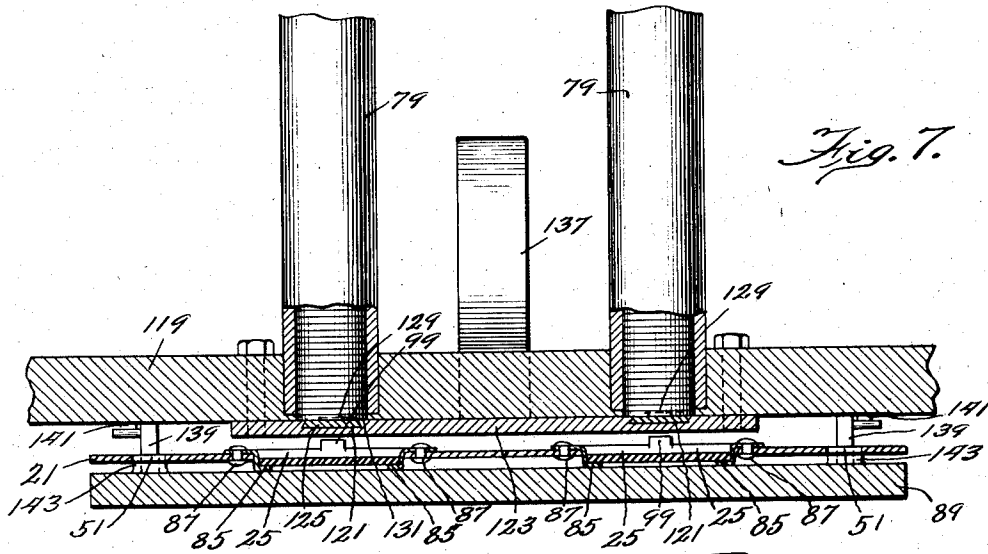


Fig. 7.

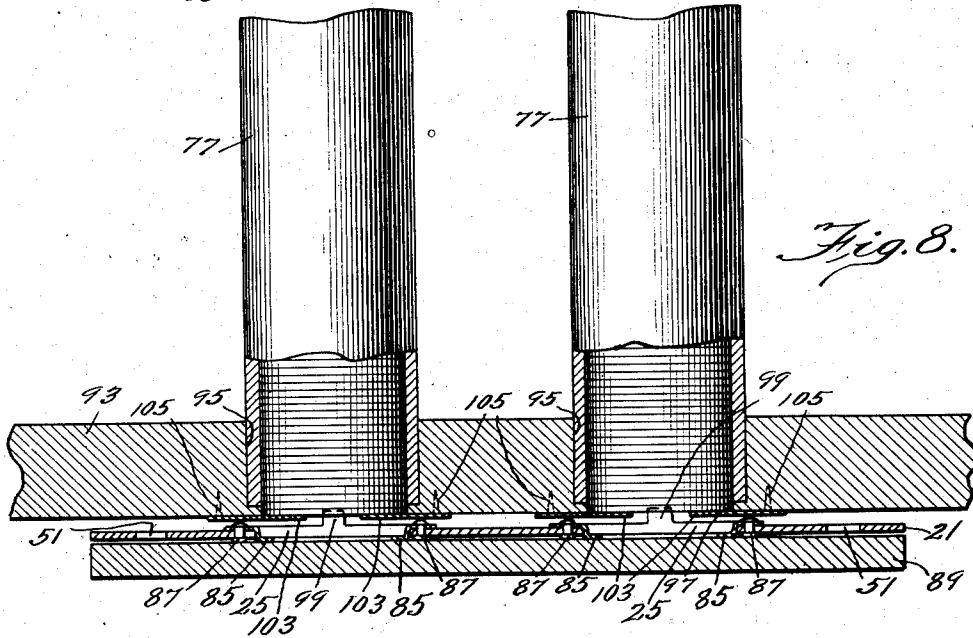


Fig. 8.

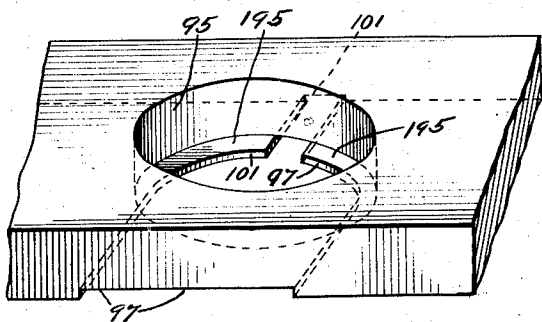


Fig. 9.

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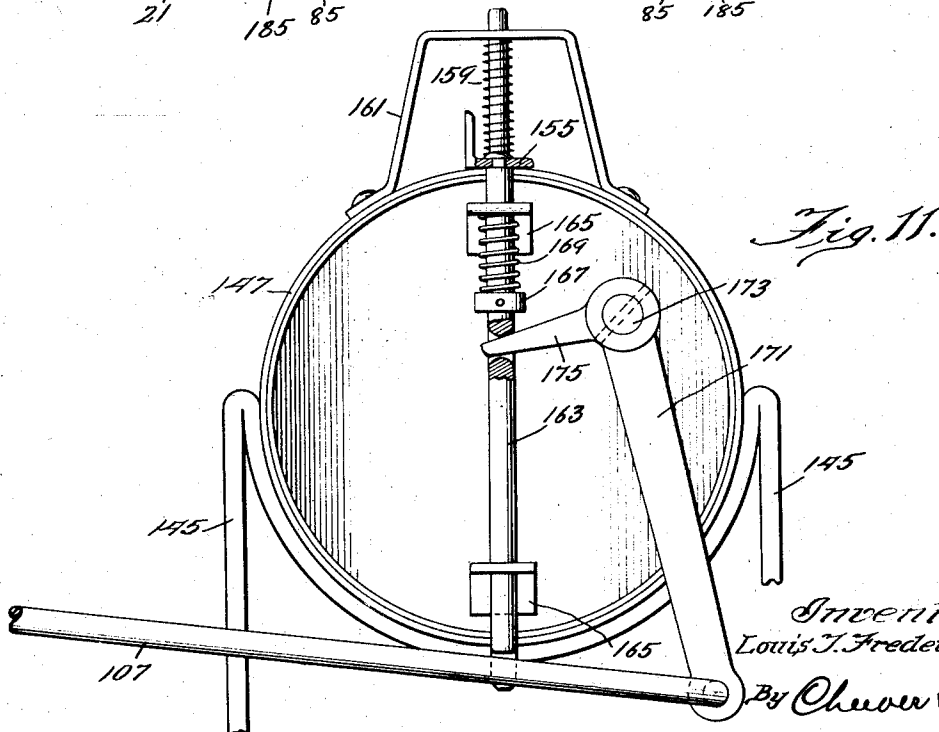
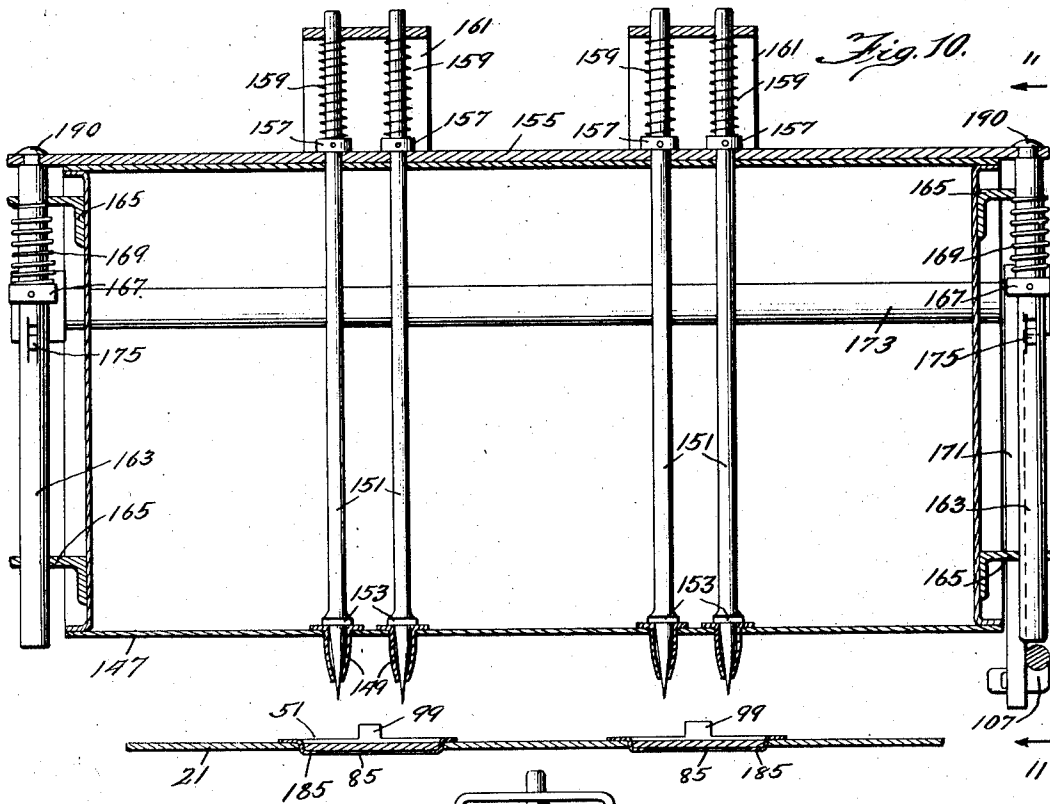
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METHOD AND APPARATUS FOR FEEDING DISKS TO A CLOSING MOLD

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6 Sheets-Sheet 6



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UNITED STATES PATENT OFFICE

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METHOD AND APPARATUS FOR FEEDING DISKS TO A CLOSING MOLD

Application filed January 18, 1928. Serial No. 247,671.

My invention relates in general to a method and apparatus for feeding material to a forming die and has more particular reference to a novel arrangement for delivering disks between the co-operating forming dies of a closing mold. More specifically, the apparatus of my invention is adapted to feed superposed mica disks, to forming dies adapted to press the disks together in forming a device of the type illustrated and described in my pending application Serial No. 102,820 filed April 17, 1926.

The process heretofore employed in making mica objects of this general nature is described in my U. S. Patent 1,589,464, and comprising heating mica disks and then inserting them in a die, which may be of the type illustrated and described in my pending application Serial No. 147,710 filed November 11, 1926. These operations are accomplished manually by a skilled operator who relies upon his own judgment as to the amount of heating necessary and who transfers the disks from the heating surface to the forming die by means of a small trowel. Such a system is capable of producing 2,500 mica rings per operator per day, and has several disadvantages:

The operator positions the disks in the press by hand, then operates the press and then removes the pressed device and scrap material before a new blank is inserted. This is a slow operation and is wasteful of time. An assistant is necessary to keep the press operator supplied with heated disks. It is necessary to supply safety appliances to protect the operator from the possible operation of the machine while he is positioning the blank. The heating of the blanks is always approximate and uncertain so that uniformity of product is practically impossible.

One object of my present invention is to provide a machine for feeding disks at a uniform rate through a heating oven to a closing mold, the parts being so arranged that the forming die receives disks, properly stacked, as rapidly as is compatible with its successful operation and the disks remain in the oven for a period sufficient to heat the material to

the most efficient temperature for pressing purposes.

Another object of my invention is to provide a machine whereby mica rings and similar articles may be formed rapidly and uniformly without necessitating the employment of a skilled operator and assistant to prepare and position the material.

Another object of my invention is to reduce the cost, while increasing the production and improving the quality, of articles pressed from disks or blanks.

Another object of my invention is the provision of a carrier adapted to receive the disks or blanks from which articles are to be pressed, carry the blanks to a closing mold, positioning the blanks for forming operation and carrying the formed blanks to a discharge point beyond the forming disks.

Another object of my invention is the provision of means for automatically depositing a blank at spaced intervals in the conveyor.

Another object of my invention is to provide a means for positioning a disk at intervals in the conveyor and to thereafter deposit a second disk centrally upon the previously positioned disk in order to eliminate the necessity of preforming a laminated blank.

Still another object of the invention is to provide a device, which I shall hereinafter refer to as an inker, the purpose of which is to deposit a small quantity of adhesive material such as shellac upon the lower disk of the stack before the upper disk is arranged in position upon the lower disk.

Numerous other objects and advantages of the invention will be apparent as it is better understood from the following description which, taken in connection with the accompanying drawings, discloses a preferred embodiment of the invention.

Referring to the drawings:

Figure 1 is an elevation view of an improved apparatus for feeding disks to a closing mold;

Figure 2 is an enlarged perspective view of a part of the apparatus shown in Figure 1, showing the mechanism for operating the inker;

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Figure 3 is an enlarged view of a portion of the conveyor element of the apparatus shown in Figure 1;

Figure 4 is a cross sectional view taken substantially along the line 4—4 in Figure 3, showing the construction of the conveyor rollers;

Figure 5 is a horizontal cross section taken substantially along the line 5—5 in Figure 1 and comprising a plan view of the disk depositing devices;

Figure 6 is a vertical cross section taken substantially along the line 6—6 in Figure 5, showing the shellac and disk depositing devices in side elevation;

Figure 7 is a vertical cross section taken substantially along the line 7—7 in Figure 6, showing the construction of the smaller disk depositing and centering devices;

Figure 8 is a vertical cross section taken substantially along the line 8—8 in Figure 6, showing the construction of the larger disk depositing devices;

Figure 9 is a perspective view of a portion of a magazine support showing the grooves and channels formed therein;

Figure 10 is a vertical cross section taken substantially along the line 10—10 in Figure 6, to show the details of the inker;

Figure 11 is a vertical cross section taken substantially along the line 11—11 in Figure 10; and

Figure 12 is a perspective view of a control cam.

To illustrate my invention I have shown on the drawings in Figure 1, a press and associated apparatus for feeding disks to the press. The press comprises a frame 11 in which a reciprocating die-operating shaft or ram 13 is mounted. This shaft carries at its lower end, a plurality of movable dies 15, adapted to cooperate with lower stationary dies 19 supported in frame 11 to form a closing mold. These dies may be of any convenient form and are preferably of the type illustrated and described in my pending application Serial No. 147,710 filed November 11, 1926. The operating shaft 13 is driven by a fly wheel 19 which in turn may be driven from a suitable power source by any convenient drive means, such as the belt illustrated. The dies 15 and 17 are adapted to receive a stack of mica disks and to press the disks to form an object such as the insulating rings illustrated and described in my pending application Serial No. 102,820, filed April 17, 1926.

In order to most conveniently feed the disks, between the dies, I have provided a conveyor 21 comprising a continuous strip of steel carried on spaced rollers 23. The conveyor has receptacles 25, adapted to receive the stacked disks, arranged at spaced intervals and the belt is moved progressively through the closing mold, each cup remaining

centered between the dies of the mold for an interval sufficient to allow the dies to press together upon the mica disks contained therein and deform the disks to the desired shape. When the dies open, the belt is moved until the next succeeding cup is arranged between the dies. The belt is moved periodically by a mechanism driven by a motor 27 suitably supported upon a bracket 29 mounted on the frame 11 of the press. The motor 27 operates through reduction gears 31 to drive a gear 33 which is mounted upon a shaft 35 suitably journaled in the punch press frame 11. The shaft 35 carries a disk having a crank pin 37 set therein. A crank arm 39 pivoted at one end on the pin 37 is pivotally connected at its other end with an arm 41 which is mounted upon a shaft 43 suitably journaled in the frame 11. The shaft 43 carries at both ends a pawl-carrying arm 45 having a pawl 47 pivotally arranged at its lower end. The pawls 47 are carried in position to ride along the upper surface of the conveyor 21 behind the closing molds, the punch press frame 11 at that point being arranged to provide a substantially flat surface 49 upon which the belt 21 rests. The belt is provided with a series of spaced apertures or driving slots 51 arranged along each side of the belt in position to be engaged by the tips of the pawls 47. As the shaft rotates, the pawls 47 are carried back and forth along the surface of the belt and tips of the pawls engage in the belt apertures 51 during their rearward travel and move the belt a distance equal to the spacing between the driving apertures 51. The receptacles 25 and the apertures 51 are so arranged in the belt with respect to the pawls 47 and the dies 15 that when the belt is stationary a receptacle 25 is centered directly between each pair of dies, which co-operate through apertures 85 in the conveyor and thus distort the mica disk contained in the receptacles. For purposes of illustration I have shown a plurality of co-operating dies 15 and 17, it being understood that as many pairs of dies may be arranged in the press as may be desired, limited only by the size of the press itself, a duplicate row of receptacles being formed in the conveyor for each pair of dies arranged in the press. In pressing molded rings or other articles from said blanks it is necessary to accurately center or otherwise position the blanks in the dies. Unless this is done a high percentage of mis-centered disks occur during production. Heretofore this centering has been accomplished by a skilled operator, but by properly adjusting the conveyor and operating mechanism above described, I am able to accurately position the disks between the dies.

The shaft 35 also carries a cam 53 adapted to control the operation of the dies through a mechanism including a bell crank 55, pivoted in the frame 11 and having a cam fol-

lowing arm actuated by the cam 53, and an arm engaging a rod 57 adapted to control the die operating connection of the fly wheel 19 and the shaft 13. This control is of a well known type and has not been illustrated in detail on the drawings, it being sufficient to say that the parts are arranged so that the upper die 15 is depressed when the cam 53 engages the bell crank, remains in depressed position while the cam engages the bell crank and is released when the cam disengages the bell crank. The cam is arranged on the shaft 35 in such a position that the dies close only when the belt is stationary, that is to say when the pawls 47 are being moved forwardly. The control cam 53 is arranged to hold the dies in closed position for an appreciable period or "dwell" in order to allow the heated mica disks to chill and set in the form to which they are pressed by the operation of the dies.

The conveyor illustrated is of the endless type and is carried upon two rollers or drums 23 mounted on shafts 59. Each roller is secured to its shaft by means of a key 590 and is provided with peripheral grooves or depressions 61 to accommodate the passage of the receptacle belt around the roller without warping or jamming. The rearmost roller is supported in a stand 63 which is secured to the supporting base on which the various elements of my device may be arranged, the shaft 59 of the roller being suitably journaled in a bearing carried in the stand 63. The punch press is carried in a supporting base 65 and the forward roller 23 is mounted in a frame or stand 67 extending outwardly in front of the punch press and secured to the base 65, the shaft of the roller being suitably journaled in a bearing slidably mounted in the frame 67; and I have provided a control screw 69 and operating handle for moving the bearing in which the forward roller is carried in order to adjust the belt tension to take up the slack.

In order that the mica disks may be distorted to the desired shape without rupturing, it is desirable to preheat the disks before pressing them in the closing mold. In the past it has been customary to preheat the disks upon a heating surface and to feed the heated disks by hand into the closing mold. In my present invention I have provided a heating oven 71 carried upon the stand 67 by means of a support member 73. The oven 71 is arranged to enclose the belt 21 between the forward roller 23 and the press. The oven is heated by means of heaters 75 which may be of any convenient type such as electrical heating units or gas jets or other controllable heating means. By controlling these heaters, I am able to maintain a desired temperature within the heating oven such that the disks, which pass through the oven at a uniform rate, may

be heated to a desired temperature within small limits of variation.

I have found that a slight difference in temperature of the disks fed to the mold will materially effect the quality of the objects produced by the mold and when it is understood that such objects are valuable because of their electrical insulating properties, the advantage of accurately controlling the temperature of the heated disks as they are fed to the closing mold, will be readily appreciated.

The apparatus described thus far may be operated by laying a stack of disks in each receptacle of the belt before it passes into the oven 71. This may be accomplished manually by operators who deposit the disks in the receptacles, or the disks may be preassembled in concentric relationship to form laminated blanks as illustrated and described in my co-pending application Serial No. 247,672 filed Jan. 18, 1928, and such a blank may be deposited in each cup by hand or automatically by feeding the blanks from a suitable magazine arranged above the belt to discharge a blank into each receptacle in the belt as it passes beneath the discharge end of the magazine. This magazine may be similar to the magazines 77 and 79, which I will hereinafter describe.

I have shown a means for mechanically assembling disks of unequal size in superposed and concentric relationship in the receptacles.

The disks are arranged in magazines 77 and 79 arranged above the belt to deposit disks in the receptacles as the belt passes into the oven. The magazines 77 are each adapted to contain a stack of the larger disks which are deposited in the receptacles first. The receptacle then is drawn under an inker 81 which is adapted to deposit adhesive material upon the upper surface of the disk. The receptacle then moves under the smaller magazine 79 which drops a disk into the receptacle centrally upon the lower disk. When the disks are preassembled to form laminated blanks, the larger magazine may be used alone.

The receptacles 25 are formed from metal punchings 83 having an aperture 85 formed therethrough. An annular flange is offset from the body of the receptacle at the edges of the aperture 85 and provides a ledge 185 upon which the edges of the large disk are supported. The conveyor is provided with an aperture adapted to receive this offset flange and each receptacle is secured to the belt by means of rivets 87 which are arranged on opposite sides of the cup and on a line perpendicular to the direction of motion of the belt. This construction allows the cups to pass around the guide rollers 23 without warping or twisting the belt as shown clearly in Figures 3 and 4 of the drawings, the receptacles assuming a tangential position as the belt passes around the roller.

While passing beneath the magazines and inker the conveyor is supported upon a table 89 which in turn is mounted on support members 91 carried by the stand 67. The large magazines 77 are mounted in a magazine carrying frame 93 which is supported at both ends from the table 89 at a height sufficient to allow the conveyor to slide by underneath and which has sockets 95 formed therein to receive the lower ends of the magazines. The magazines comprise cylindrical tubes and the sockets extend into the frame 93 to adjacent the lower surface thereof, forming ledges 195 on which the lower ends of the magazines are adapted to rest. A groove or channel 97 is formed in the lower surface of the frame 93 from the lower end of the socket to the forward end of the frame through which a disk may be slid edge-wise when dropped thereon from the magazine above. The receptacle 25 passes across the table 89 beneath the strip and is provided at its rearward edge with an upstanding portion or tooth 99 bent up from the body of the receptacle and the lower surface of the frame 93 is grooved at 101 to allow the tooth 99 to pass thereacross and engage behind a disk in the channel 97. Retaining strips 103 are secured by means of screws 105 across the lower surface of the frame 89 on each side of the channel 97 to support the deposited disk in the channel in position to be engaged by the upstanding tooth 99 on the receptacle 25. As the receptacle passes beneath the magazine the tooth 99 slides through the groove 101 and engages the rear-most edge of the disk dropped from the magazine and pushes it along the channel 97, the disk being retained in the channel by the strips 103 until the disk has passed beyond the forward edge of the frame, at which time the disk falls into the receptacle. Thence the receptacle passes beneath the inking device 81 which deposits a drop of adhesive material on the upper surface of the disk, the inker being operated by a mechanism comprising a rod 107 actuated periodically by a pin 109 on the die-operating rod 13 by means of the mechanism, shown in Figure 2 of the drawings, in which the pin 109 engages a finger 111 mounted on a rod 113 suitably journaled in the press frame 11 every time the rod 13 descends. As the dies close, the pin 109 depresses the finger 111 which operates the inker by turning the rod 113, just described, which in turn moves the inker rod 107 which at one end is secured to an arm 115 mounted on the rod 113. The inker is thus operated each time the dies close, i. e., when the conveyor and receptacles are stationary. The discharge nozzles of the inker are positioned immediately above a point in the table 89 where the receptacles remain stationary while the dies are operating so that each time a cup passes beneath the inking nozzles adhesive

material is deposited upon the disk contained therein.

From beneath the inking nozzles the receptacles each containing an "inked" disk, pass beneath the second or smaller disk magazines 79. These magazines contain smaller disks than are arranged in the larger magazines 77, and it is necessary to provide a means for centering the smaller disk upon the previously deposited larger disk, as it is deposited in the receptacle.

The magazines 79 are carried in a frame 119 similar to the frame 93 and having sockets, similar to the sockets 95, formed therein to receive the lower ends of the magazines. The frame 119 is suitably supported from the table 89 and has disk receiving channels, similar to the channels 97 formed in the frame 93. The frame 119 is also provided with a groove 121 similar to the groove 101 of the frame 93. A plate 123 is secured across the lower surface of the frame 119 and closes the lower end of the disk receiving channels. This plate has a function similar to the retaining strips 103 in that it supports the disks deposited in the channels until they are discharged into the receptacles 75. In order to eject the disks from the grooves into the receptacles centrally upon the larger disks deposited therein from the magazines 77, I have provided slides 125 adapted to operate in grooves 127 formed in the plate 123 diametrically beneath the discharge ends of the magazines 79 and parallel to the axis of the disk channels. Each slide has a lower bevelled portion adapted to engage a groove 127 and has an upwardly extending ridge 129 formed along its upper edge, the forward end of which is adapted to engage the disk supported in the groove 131, the ridge sliding laterally along in the groove 121 to allow the forward end to engage behind the disk. Each slide at its rear or butt end is provided with a lug 133 through which a rod 135 is journaled to insure the simultaneous operation of the slides 125. A spring 137 retains the slides in the normally retracted position shown in Figure 6 of the drawings. This spring is secured between the frame 119 and the rod 135. The rod 135 carries pawls 139 in position to engage the slots 51 in the conveyor. Each pawl is resiliently urged to contact the upper surface of the belt by a spring strip 141 secured in the rod 142 and acting upon a pin secured in the body of the pawl. As the belt passes across the table 89, the tips of the pawls 139 engage in the slots 51 as shown in Figure 6 of the drawing and further movement of the belt projects the slides forward against the tension of the spring 137, to the position shown in dotted lines in Figure 6 at which point cam surfaces 143, formed on the table, operate to release the pawls 139 from engagement in the slots, whereupon the slides will be retracted

by the spring 137 to their normal position. As the slides move forward, as aforesaid, the forward edges of the ridges 129 engage behind the disks in the channels and move the latter forwardly until they pass beyond the forward edge of the plate 123 which is so arranged that the disk then falls into the receptacle which is in position therebeneath to receive the second disk centrally upon the first.

The inker 81 is supported from the table 89 by any convenient means, such as the strap iron carrier 145, and comprises a substantially cylindrical reservoir 147 having discharge nozzles suitably arranged therein. The discharge through the nozzles is controlled by needle valve stems 151 having sealing tips 153 formed at their lower ends. The valve stems extend upwardly through the reservoir and through an operating bar 155 arranged across the top of the reservoir. Above the operating bar the rods are provided with collars 157 which engage the lower ends of springs 159 which are threaded about the valve stems. The upper ends of the valve stems pass through lugs 161, secured to the top of the reservoir, which serve the dual purpose of guiding and supporting the needle valve rods and furnishing resisting shoulders for the upper ends of the springs. The operating bar 155 extends laterally beyond the sides of the reservoir and is secured to lifter rods 163 which are slidably supported in lugs 165 formed on the sides of the reservoir. Each rod 163 has a collar 167 formed thereon and carries a spring 169 arranged between the collar and the upper lug 165. The operating rod 107 extends adjacent the inker and is operatively secured to the lower end of a crank arm 171 which operates to turn a shaft 173 suitably journaled in the reservoir ends. This shaft carries, at each end, a finger 175. These fingers have operative engagement with the lifter rods 163 and when the operating rod 107 is moved by the mechanism heretofore described and shown in Figure 2, the fingers 175 raise the lifter rods and the bar 155 against the tension of the springs 169 which are compressed between the collars 167 and the lugs 165. The upward movement of the bar 155, which is secured below the collars 157 on the needle valve stems, raises the latter against the tension of the springs 159. When the sealing tips 153 are raised, adhesive material flows downwardly through the discharge nozzles 149 and falls upon a disk which is in a receptacle immediately underneath. The operating mechanism shown in Figure 2 is so arranged that the sealing tips are raised for a period sufficient to allow the escape of a limited amount of adhesive material per nozzle, sufficient to secure the smaller disk in place upon the larger when it is thereafter dropped in place thereon as heretofore described.

The disks are stacked in the receptacles as described and are carried to the dies 15 and 17 through the oven which heats the stacked disks. The dies form and chill the heated blank and the conveyor then carries the formed article and the scrap material from the dies over the flat table surface 49 and discharges them through a chute 177 into a receiver placed beneath the chute. This receiver may be a sorting table, where an operator inspects the device for imperfections or may be a bin or other receiver. By forming the apertures 85 of the receptacles sufficiently small, the scrap material, which comprises an annular portion sheared from the edges of the disks by the forming dies, is carried along without falling through the aperture 85 into the chute 177 and is discharged over the end of the rear roller 23 into a scrap receiver. In this way the formed rings may be separated from the scrap automatically and the necessity of sorting the product thereafter is eliminated.

I have found that a machine of the type herein described has a production capacity per day of approximately five times that of a skilled operator and assistant and by providing a press having a plurality of dies each fed by a series of receptacles or pockets in the belt, the ultimate capacity of a single press may be realized instead of limited, as at present, to the capacity of a single skilled operator. I have also discovered that the quality of the product is materially improved by carefully regulating the temperature of the heating oven, a variation in temperature of a few centigrade degrees, from the desired ideal, causing the quality of the insulating rings produced to be materially effected. The device of my invention is thus not only adapted to increase the production of a single press, but also produces a more uniform product of improved quality and moreover permits the regulation of the desired characteristics of the product.

It will be apparent that numerous changes may be made in the form and arrangement of the various parts herein described without departing from the spirit and scope of the invention, the description being of a preferred embodiment for purposes of illustration only.

Having thus described my invention what I claim as new and desire to secure by Letters Patent is:—

1. In a device of the class described, a pair of forming dies, a conveyor adapted to receive material, means for moving said conveyor between the dies, means interrupting said movement whereby the material carried by the conveyor may be held stationary between said dies, and means for closing the dies while the material is so positioned whereby to configure the material directly between the dies.

2. In a device of the class described, a pair

of forming dies, means comprising a heated zone adjacent said forming dies, a conveyor adapted to receive a disk, means for moving said conveyor at a uniform rate through said heated zone and between said dies, means interrupting said movement whereby a disk carried in said conveyor may be arranged between said dies and means for operating said dies while a disk is so arranged.

3. In a device of the class described, a pair of forming dies, a conveyor adapted to receive moldable material, a reciprocating driving element having periodical driving engagement with the conveyor to move the same between the dies, said means being arranged to position said conveyor so that the moldable material carried thereby is positioned in definite alignment between the dies upon the material, and means for closing dies while the material is so positioned.

4. In a device of the class described, a pair of forming dies, a conveyor adapted to receive disks therein, means for moving said conveyor between the dies, said means being adapted to leave the belt stationary at periodic intervals in a position such that a said disk is aligned between the dies, and means for closing the dies upon opposed sides of the disk while said disk is so aligned.

5. In a device of the class described, a pair of forming dies, a conveyor adapted to receive disks, means providing a heated zone adjacent said dies and means for moving the conveyor periodically between the dies whereby each portion of the conveyor remains within the heated zone for a definite period.

6. In a device of the class described, forming dies, a conveyor for carrying disks to the forming dies, said conveyor having a spaced series of disk receiving receptacles formed therein, means for moving said conveyor whereby said receptacles may be successively arranged between said forming dies and means for operating the dies when the disk receiving receptacles are stationary therebetween, said receptacles being formed and arranged to permit the dies to operate upon the opposed faces of the disks.

7. In a device of the class described, a pair of forming dies, a conveyor for carrying disks to the forming dies, said conveyor having a spaced series of disk receiving receptacles formed therein, which receptacles comprise an individual cup secured in the conveyor and adapted to rock about an axis normal to the direction of movement of said conveyor whereby the conveyor may pass around guide rollers without interference from the receptacles.

8. In a device of the class described, a pair of cooperating forming dies, a conveyor for carrying moldable material to the forming dies, said conveyor having a spaced series of material receiving receptacles formed at intervals thereon, which receptacles comprise

a cup secured to the conveyor on a line perpendicular to the direction of motion thereof.

9. In a device of the class described, a closing mold, a conveyor adapted for carrying disks to the closing mold, said conveyor having disk receiving receptacles arranged at intervals therein, each receptacle comprising a cup shaped member secured to the conveyor and having a central aperture and an adjacent disk supporting shoulder, and means for arranging said receptacles in alignment in said closing mold whereby a mold portion may operate on a disk through said apertures.

10. In a device of the class described, a closing mold, a conveyor adapted for carrying disks to said closing mold, said conveyor having a disk containing receptacles arranged therein, said receptacles comprising a cup secured to said conveyor and having a central opening therein and an annular disk supporting shoulder formed adjacent opening, means for moving said conveyor to align said receptacles in said closing mold, and means for operating said closing mold while said receptacles are so aligned whereby the closing mold may operate through the said opening therein.

11. In a device of the class described, forming dies, a conveyor for carrying moldable material to the forming dies, said conveyor having material supporting receptacles formed therein, the center portion of said receptacles cut away to permit the forming dies to co-operate upon the material through the opening.

12. In a device of the class described, co-operating forming dies, a conveyor for carrying disks between the forming dies, disk supporting receptacles comprising cups comprising a portion by which they may be attached to the conveyor, a disk supporting shoulder, and a circular opening, secured in said conveyor, means for aligning said receptacles consecutively between said forming dies and means for operating said forming dies when a receptacle is so aligned whereby the forming die may operate through said aperture.

13. In a device of the class described, a closing mold, a conveyor adapted to carry disks to the closing mold and comprising a plurality of disk supporting receptacles arranged in an endless support, each receptacle comprising a cup formed in a central opening and an offset disk supporting shoulder arranged about said opening.

14. In a device of the class described, a closing mold, a conveyor adapted to carry disks to the closing mold and comprising a plurality of disk supporting receptacles arranged in an endless support, guide rollers for carrying said endless support, each receptacle being arranged to rock in the support about an axis parallel to the axis of said support roll-

ers whereby said support may pass freely around said rollers.

15. In a device of the class described, a closing mold, a conveyor comprising an endless belt for conveying material to the closing mold, support rollers about which said belt operates, a receptacle secured to the belt at points on a line normal to the direction of the belt travel whereby the receptacle may rock upon the belt while passing around the support rollers.

16. In a device of the class described, a closing mold, a conveyor for carrying a disk to the closing mold, a disk containing magazine and means on said conveyor for drawing a disk from said magazine onto said conveyor at a predetermined point therein as the conveyor progresses to the closing mold.

17. In a device of the class described, a closing mold, a conveyor for carrying a disk to a closing mold, said conveyor having a disk supporting receptacle formed therein, a disk containing magazine arranged adjacent said conveyor, and means on said conveyor for drawing a disk from said magazine into said receptacle as the receptacle passes the magazine on its way to the closing mold.

18. In a device of the class described, a closing mold, a conveyor for carrying a disk to the closing mold, said conveyor having a disk supporting receptacle arranged therein, a disk containing magazine arranged adjacent said conveyor and means on said receptacle for drawing a disk from said magazine into said receptacle as the latter passes the magazine.

19. In a device of the class described, a closing mold, a conveyor for carrying a disk to the closing mold, a disk magazine past which said conveyor moves to the closing mold and having cooperating means actuated by said conveyor for expelling a disk from the magazine onto said conveyor at a predetermined point therein.

20. In a device of the class described, a closing mold, a conveyor for carrying a disk to the closing mold, said conveyor having a disk supporting receptacle formed therein, a disk containing magazine past which said conveyor carries said receptacle and means cooperating with said conveyor and actuated by the movement thereof for expelling a disk from said magazine into said receptacle.

21. In a device of the class described, a closing mold, a conveyor adapted to carry disks to the closing mold, means for moving the conveyor, a disk containing magazine past which said conveyor is moved, means on said conveyor for drawing a disk from said magazine onto the conveyor, a second magazine past which said conveyor is moved and means for depositing a disk from said magazine centrally upon said priorly deposited disk.

22. In a device of the class described, a

closing mold, a conveyor adapted to carry disks to the closing mold, means for moving the conveyor, a disk containing magazine past which the conveyor is moved, means on said conveyor for drawing a disk from said magazine onto the conveyor, an inking device past which said conveyor is moved, means actuating said inking device to deposit adhesive material on said disk as it passes the inking device, a second magazine past which said conveyor is moved and means actuated by said conveyor for depositing a disk from said magazine centrally upon said priorly deposited disk.

23. In a device of the class described, a closing mold, a conveyor adapted to carry disks to the closing mold, means for moving the conveyor, a disk containing magazine past which the conveyor is moved, means on said conveyor for drawing a disk from said magazine onto the conveyor, an inking device past which said conveyor is moved, means actuated by the conveyor moving means for operating said inking device to deposit adhesive material on said deposited disk as it passes the inking device, a second magazine past which said conveyor moves and means actuated by said conveyor for depositing a disk from said magazine centrally upon said priorly deposited disk.

24. In a device of the class described, a closing mold, a conveyor adapted to carry disks to the closing mold, means for moving the conveyor, a disk containing magazine past which the conveyor is moved, means on said conveyor for drawing a disk from said magazine onto the conveyor, a second magazine past which said conveyor is moved and means for depositing a disk from said magazine centrally upon said priorly deposited disk, and an oven through which said conveyor carries said deposited disk.

25. In a device of the class described, a pair of forming dies and a perforated conveyor for carrying disks between the forming dies, said dies being adapted to co-operate through said perforations in forming said disks.

26. The method of feeding disks to a closing mold which comprises arranging said disks in stacked relationship in a conveyor and guiding the conveyor between the closing mold in such a manner that said stacked disks are centered in the closing mold.

27. In a device of the class described, a mold for configuring flat elements, a conveyor for carrying said elements to the mold, means for holding the flat elements accurately positioned on the conveyor and other means for accurately positioning the conveyor relatively to the mold whereby the flat elements may be accurately positioned relative to the mold.

28. In a device of the class described, a mold for configuring flat elements, a con-

veyor for carrying said elements to the mold, means for holding the flat elements accurately positioned in the conveyor, and means associated with said mold for positioning the conveyor relative thereto whereby a flat element may be accurately aligned relative to the mold.

29. In a device of the class described, a mold for configuring flat elements, a conveyor for carrying said elements to the mold, means for holding the flat elements accurately positioned on the conveyor, and means associated with the mold for arranging the flat elements in position during the configuring operation.

30. In combination, a mold for configuring flat elements, a conveyor belt for supporting said flat elements in definite position in the belt and conveying them to the mold, and rollers for guiding said belt to the mold, and means for advancing the belt, said belt being of substantially non-stretchable, nonshrinkable material, whereby the flat elements may be accurately conveyed to a definite position in the mold.

31. In a combination, a mold for configuring flat elements, a conveyor belt for supporting said flat elements in definite position in the belt and conveying them to the mold, and rollers for guiding said belt to the mold, and means for advancing the belt, said belt being formed of a substantially nonstretchable metallic material whereby the flat elements may be accurately conveyed to a definite position in the mold.

32. In a device of the class described, a mold, a flexible conveyor for carrying flat elements to the mold, said conveyor having receptacles arranged therein to receive the flat elements, said receptacles being substantially non-flexible.

33. In a device of the class described, a mold, a flexible conveyor for carrying flat elements to the mold, said conveyor having substantially rigid receptacles arranged at definite positions therein.

34. In a device of the class described, a mold, a flexible conveyor for carrying flat elements to the mold, said conveyor having substantially rigid receptacles arranged in apertures formed therethrough.

35. The process of making pressed mica products which comprises, forming a plurality of flat mica elements, arranging a film of binder between adjacent elements, heating said elements and configuring said heated elements in a chilled mold to form a pressed article and scrap and separating said article from the scrap.

36. The process of making pressed mica objects, which comprises preforming a laminated mica blank, heating said blank, pressing said blank in a chilled mold to form a pressed article and scrap and separating said article from the scrap material.

37. The method of making pressed mica products which comprises arranging flat mica elements in superposed relationship, heating, accurately positioning and configuring said arranged elements in a chilled mold, to form a pressed article and scrap, ejecting said article and scrap from the mold, and sorting the same.

38. In a device of the class described, a closing mold, a conveyor for carrying a disk to the closing mold, said conveyor having a disk supporting receptacle formed therein, a disk containing magazine, past which said conveyor is moved, and means for expelling a disk from said magazine into said receptacle, as it passes the magazine.

39. In a device of the class described, a pair of forming dies, a perforated conveyor for carrying disks between the forming dies, means for guiding the conveyor between the forming dies in such a manner as to support the disk in aligned position between the forming dies, means for operating the forming dies to configure the disk therebetween, and means for moving the conveyor whereby to carry the formed disk away from the dies.

40. In a device of the class described, a pair of forming dies, a perforated conveyor for carrying disks between the forming dies, means for guiding the conveyor between the forming dies in a position to support the disk in aligned position between the forming dies, means for co-operating the forming dies through a perforation of the conveyor to configure the disk between the dies, and means for moving the conveyor whereby to carry the forming disk away from the dies.

In witness whereof, I have hereunto subscribed my name.

LOUIS T. FREDERICK.