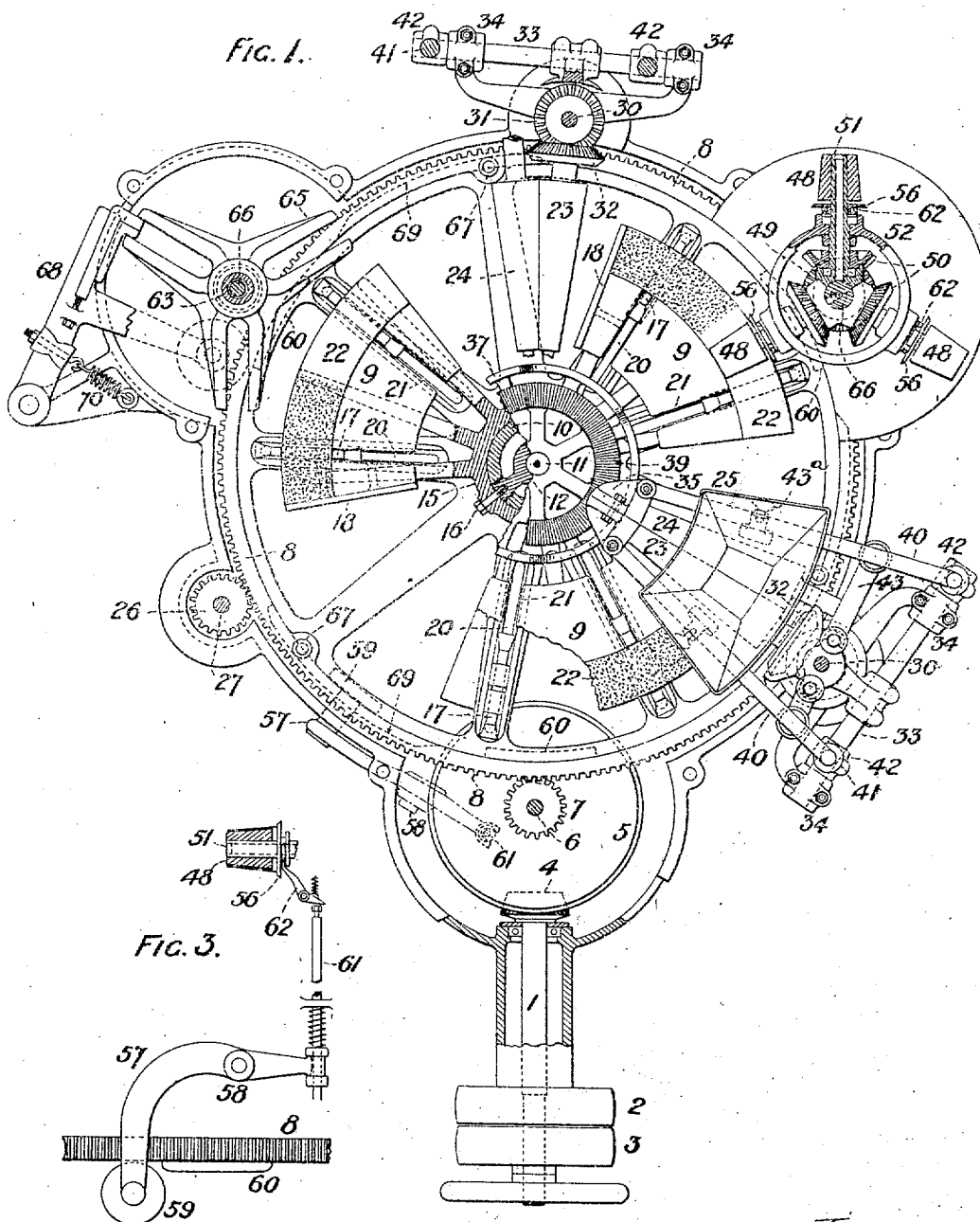


E. Z. TAYLOR.
MACHINE FOR MAKING CONICAL PAPER TUBES.
APPLICATION FILED MAR. 5, 1910.

1,020,165.

Patented Mar. 12, 1912.

2 SHEETS—SHEET 1.



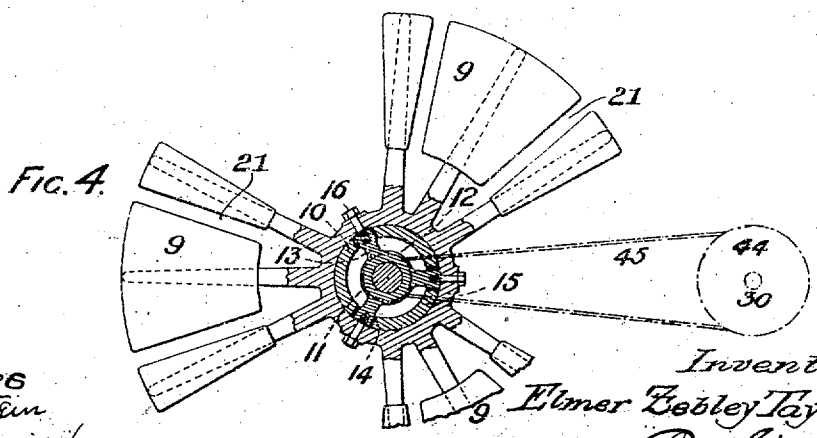
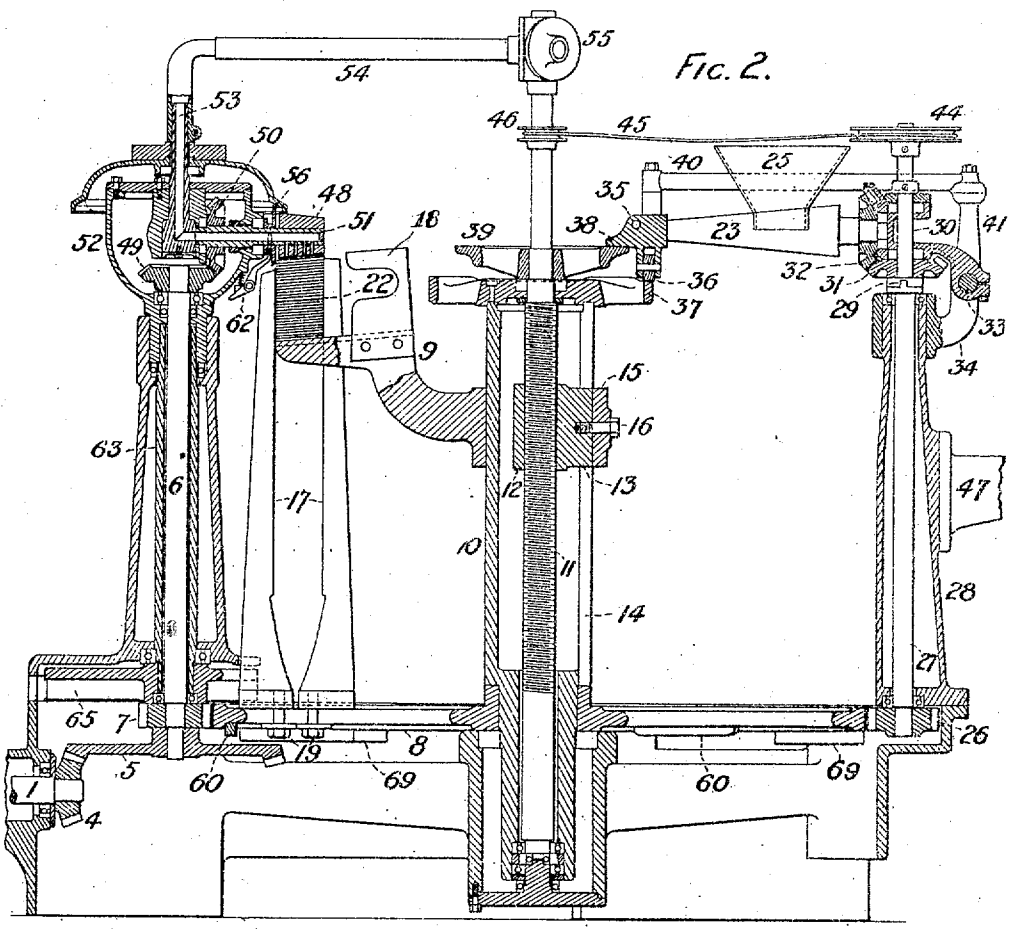
Witnesses
R. Rodstein
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Inventor
Elmer Zebley Taylor
By J. Singer
Att'y

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C. Schallenger

Inventor
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UNITED STATES PATENT OFFICE.

ELMER ZEBLEY TAYLOR, OF LONDON, ENGLAND, ASSIGNOR, BY MESNE ASSIGNMENTS, TO AMERICAN MONO SERVICE COMPANY, OF ATLANTIC CITY, NEW JERSEY, A CORPORATION OF NEW JERSEY.

MACHINE FOR MAKING CONICAL PAPER TUBES.

1,020,165.

Specification of Letters Patent.

Patented Mar. 12, 1912.

Application filed March 5, 1910. Serial No. 547,563.

To all whom it may concern:

Be it known that I, ELMER ZEBLEY TAYLOR, a citizen of the United States, residing at 40, 41, and 42 Percival street, Goswell Road, in the city of London, England, engineer, have invented certain new and useful Improvements in Machines for Making Conical Paper Tubes, of which the following is a specification.

10 This invention relates to machinery for the manufacture of conical tubes of paper, or the like, the object being to provide a machine by means of which the operations of pasting a blank which has been previously cut to the necessary form, and of subsequently rolling such blank up into shape may be expeditiously and economically effected.

20 The machine has been specially designed for use in the manufacture of paper vessels of that class which are used for the delivery of milk or cream to customers, and which are usually of conical form, tapering slightly from the top inward, and comprise a paper body into which a bottom piece, also of paper, is fitted.

25 I will proceed to describe my improved machine in connection with the accompanying drawings, in which:—

30 Figure 1 is a plan view of the machine, with parts in section, and other parts removed to enable the operation to be more clearly seen. Fig. 2 a longitudinal section through such machine, Fig. 3 a detail view of the stripper operating mechanism, and 35 Fig. 4 a sectional plan-view of the platen and means for operating same.

In carrying out my invention I employ a main driving shaft 1, on which fast and 40 loose pulleys 2 and 3 are mounted, and which by means of bevel pinion 4 and bevel wheel 5 communicates motion to a vertical shaft 6, on the lower end of which is a pinion 7 engaging with a large gear wheel 8. The latter thus has a continuous 45 rotary movement imparted to it, which movement is utilized to effect the operation of the various sets of apparatus hereinafter described.

50 In the arrangement illustrated three sets of pasting apparatus and three sets of rolling apparatus are combined and operated in such a manner as to secure the greatest possible output of the machine. It will, how-

ever, be understood that by disconnecting 55 one or more sets of each class of apparatus the output may be modified to suit the requirements, and further, that instead of there being only three sets of each class there may be four, or more. 60

The blanks to be operated on are placed on tables or platens 9, to which rotary movement is imparted by means of the gear wheel 8, which is mounted near the lower end of a central sleeve or column 10, surrounding a 65 screw spindle 11, on which works a nut 12, which is prevented from turning relatively to column 10 by forming it with wings 13, working in slots 14, formed in column 10. The boss 15 of platens 9 is secured to the 70 outer ends of wings 13 by means of bolts 16, and such platens are therefore supported by nut 12, while in addition to the rotary movement imparted to the platens by such column such platens are capable of being raised and 75 lowered by the means and for the purpose hereinafter described.

The blanks are retained in their proper positions on the platens by means of side guides 17 and back supports or fences 18. 80 The side guides 17 may conveniently be carried by the spokes of gear wheel 8, and for the purpose of enabling same to be adjusted to suit different sized blanks are preferably secured by bolts 19 passing through 85 radial slots 20 formed in such spokes. The side guides 17 may also pass through radial slots 21 in the platens 9, and as shown clearly in Fig. 2 will hold the blanks 22 securely in position against sidewise movement. 90

As there will be no tendency for the blanks to move endwise, except in the direction opposed to that of the rotary movement of the platens, it is only necessary to provide the back supports or fences 18, which are preferably bolted to side extensions of the spokes of gear wheel 8, and extend upward to approximately the same height as the uppermost blank of the series on platen 9, their upper edges being inclined at an inclination 95 corresponding to that of the platen surface.

It should be stated that as the sides of the completed vessels are usually of double the thickness of the paper used in their manufacture, it is necessary that the blanks be of 100 such length as to twice encircle the mandrel or former on which they are rolled into shape.

In the operation of the machine the blanks first arrive at the pasting mechanism, which is disposed above them and arranged to be out of contact with the upper one during the first part of the travel, and is then lowered so as to, apply the paste to the second half of the upper blank as the latter passes thereunder.

The pasting apparatus comprises a pair of conical rollers 23, 24, the former of which is mounted at a slightly lower level than the latter and constitutes the paster proper, the roller 24 merely co-acting with it to insure the supply of paste. A reservoir 25 of paste, the lower open end of which is so formed as to be closed by the rollers, is mounted above the latter. Such rollers 23, 24 are continuously rotated, through the gear wheel 8, by means of a pinion 26 on the lower end of a vertical spindle 27 passing through a standard 28. At the upper end of such standard the spindle 27 is enlarged and formed with a tongue 29 normally engaging a groove in the enlarged lower end of a shaft 30 in line with and practically forming a continuation of shaft 27, the motion of the latter being always communicated to shaft 30 when the tongue 29 is in engagement with the groove. On shaft 30 is a bevel gear 31 engaging with a bevel gear 32 on the spindle of roller 23, which is thus rotated, and by its contact with roller 24 also rotates the latter, so that the two by their conjoint action will feed the paste.

The outer extremity of the pasting mechanism is supported by a horizontal shaft 33 carried in bearings 34 at the upper end of the standard 28 above referred to, while at its inner extremity it is provided with a foot piece 35 carrying a roller 36, working in conjunction with a cam 37, mounted on the central screw 11. The upper edge of this cam, on which roller 36 runs, is so formed that as the central screw 11 rotates the pasting mechanism will be alternately raised and lowered, these movements taking place at such times that the piles of blanks 22 will have passed approximately half way under the pasting roller 23 before the latter is lowered into contact therewith, and such roller 23 will be again raised before the next pile of blanks 22 arrives beneath same. The foot piece 35 is also formed with a surface 38 adapted to normally rest, when such foot piece is in its lowered position in relation to cam 37, on the roughened upper surface of a friction disk 39 mounted rigidly on the central screw 11, this contact being utilized to control the upward feed of the piles of blanks, so as to always retain the upper one at approximately the same level. The operation of this arrangement is that when the foot piece 35 presses heavily on the friction disk 39 as for instance when a number of the blanks have been removed

from the piles so that the greater part of the weight of the pasting mechanism is supported by such disk 39, this pressure will have a retarding action on the rotation of the screw, causing it to work slightly through its nut 12, and as the latter cannot turn owing to its wings 13 engaging the slots 14 in central column 10, such nut will be correspondingly raised, carrying with it the platens 9, on which the piles of blanks are mounted, so bringing the upper blanks to their proper height in relation to the pasting mechanism.

The foot piece 35 carries the bearings for the inner ends of the pasting and feed rollers 23 and 24, and is supported from the horizontal shaft 33 by means of rods 40, the outer ends of which are carried by posts 41 provided with bearings 42, mounted on shaft 33. The bearings for the outer ends of the rollers 23 and 24 are supported from these rods 40 by means of a cross bar 43. Such rods 40 also serve to support the paste reservoir 25, which may be secured thereto by means of thumbscrews 44 as shown in Fig. 1.

A belt or cord pulley 44 (Figs. 2 and 4) may be mounted on the upper end of shaft 30 and be connected by a belt or cord 45 with a corresponding pulley 46 on the upper end of the central screw 11, such belt or cord being arranged to run loosely so that it does not transmit motion during the ordinary running of the machine. When, however, the platen 9 has reached its highest position and it is desired to lower it, this may be effected by slightly lifting the inner end of the pasting mechanism, sufficiently to tighten the belt or cord 45 without disengaging the tongue 29 on shaft 27 from the groove in the lower end of shaft 30, when the motion of the latter will be transmitted to the central screw 11, and as this motion will be in the opposite direction to that imparted to it in the general operation of the machine the nut 12 will with the platens 9 carried thereby be returned to their lowest position ready for a fresh charge of blanks.

It will be seen that with the arrangement above described, as all the parts of the pasting mechanism are mounted pivotally in relation to shaft 33, such entire mechanism can, if desired, be turned right over on such shaft as a pivot, enabling easy access to be had to parts not otherwise readily accessible, and also permitting of the pasting mechanism being thoroughly cleaned when necessary by pouring hot water over same, or otherwise. A bracket 47, (shown broken off in Fig. 2) may conveniently be secured to the outer side of standard 28 and be provided at its outer end with a part with which the foot piece 35 may come in contact when the pasting mechanism is thus turned over.

After the pasting of the blanks has been

effected in the manner above described, such blanks are in the continuous operation of the machine brought to the rolling mechanism, which is arranged to take the pasted top blank from each pile and roll it up to the desired form. For this purpose it is preferred to employ an arrangement such as that illustrated, in which each set of rolling mechanism comprises a plurality (three as shown for instance) of the actual appliances for effecting the rolling operation, these separate appliances operating one at a time and being then brought to an inoperative position in which the attendant may remove the rolled blank.

Each rolling apparatus comprises a roller or mandrel 48 of conical form corresponding to that desired in the finished article, and to which a continuous rotary motion is imparted by means of bevel gear wheels 49 and 50 mounted respectively on the shafts 6, 66, 66 and on horizontally arranged spindles 51 carried in a head 52. To cause the conical rollers 48 to grip the blanks when they come in contact therewith suction may be employed, the rollers 48 in this case being finally perforated along the whole length of that portion of their circumference which contacts with the forward edge of the blank. The spindles 51 on which the rollers are mounted are preferably hollow, and the bore is, when the roller is in its operative position, connected up to that of a hollow vertical spindle 53, the upper end of which communicates through pipe 54 with a fitting 55 through which the suction is produced by any suitable means. The forward edge of the blank being taken up by the means described, the continued movement of the platen and the rotary movement of the conical roller 48 on its spindle 51 will cooperate to roll up the whole length of such blank on the roller, bringing the pasted portion into contact with the outer surface of the unpasted portion and causing it to adhere thereto.

When the blank has been completely rolled up it is ready for delivery from the machine, and for the purpose of assisting its removal, which may be effected by hand, a stripper 56 is employed, same being mounted on the hollow spindle 51 of each of the rolling appliances. The means for operating such stripper is shown more particularly in Fig. 3 and comprise a bent lever 57 pivoted at 58 to the standard in which the shafts 6, 66, operate. At its outer free end lever 57 carries a roller 59, which works against a cam 60 on the under side of gear wheel 8, while its other end engages between collars on a vertical shaft 61 the upper end of which is caused, when cam 60 actuates lever 57, to come into contact with the tail end of the lever 62 for operating the stripper 56, turning the lever 62 on its

pivot and thereby causing its forked end to engage the stripper and force it outward, so that as such stripper is normally in contact with the edge of the rolled up blank, which as shown projects slightly beyond the edge of roller 48, such rolled up blank will be forced slightly outward, just sufficiently to free it from the roller, and it can then be removed by hand. Such action of the stripper and removal of the rolled blank are preferably, as in the arrangement shown, deferred until the roller 48, which has been in use, has been turned to an inoperative position, and which may be effected in the following manner:—The head 52 carrying the spindle 51 on which the rollers 48 are mounted is arranged so as to be capable of turning in relation to the central spindles 6, 66 by which the rotary motion is communicated to the rollers, such head being carried by a sleeve 63 surrounding shafts 6, 66 and having keyed thereto at its lower end a star wheel 65 to which an intermittent motion may be imparted by any suitable means, as for instance by causing such star wheel to engage rollers 67 mounted on gear wheel 8. It will be seen that as the latter is revolved the rollers 67 will enter the slot of one arm of the star wheel, and the continued rotation of the gear wheel 8 will turn such star wheel on its pivot for (in the arrangement shown) exactly one third of a revolution, and as sleeve 63 connects the star wheel with head 52 carrying rollers 48, such head will also be turned for a third of a revolution, bringing another roller 48 into operative position, and the one that has just operated into a convenient position for the removal of the rolled blank.

In order to insure that the star wheel and parts connected therewith shall be brought to rest in their correct positions the arrangement shown at the left of Fig. 1 may be employed, comprising a pivoted catch or dog 68 the nose of which is caused to enter the slot of one of the arms of the star wheel 65 immediately the latter arrives at its stopping position, and which remains engaged with such slot until the star wheel is just about to move again. The catch 68 is acted upon by cams 69 formed on gear wheel 8, against the action of a spring 70 which tends to normally hold it in engagement with the star wheel.

As hereinbefore stated the stripper 56 is preferably arranged to be operated after the roller 48 carrying a rolled blank has been turned to a position out of the path of travel of the pile of blanks, thus facilitating the subsequent removal of such rolled blank by hand by the attendant.

I claim—

1. A machine for the purpose described comprising in combination, a continuously rotating platen on which a pile of shaped

blanks is placed, such platen being capable of rising automatically to accommodate itself to the decreasing height of the pile of blanks thereon, means for imparting rotary movement to such platen, means at the axis of rotation of said platen for automatically raising such platen during bodily rotation thereof, means for lowering such platen when necessary, means for positioning the blanks thereon, means for applying paste to such blanks, and means for rolling the pasted blanks to conical form substantially as specified.

2. A machine for the purpose described comprising in combination, a continuously rotating platen on which piles of shaped blanks are placed, such platen being capable of rising automatically to accommodate itself to the decreasing height of the piles of blanks thereon, means for imparting rotary movement to such platen, means at the axis of rotation of said platen for automatically raising such platen during bodily rotation thereof, means for lowering such platen when necessary, means for positioning the piles of blanks thereon, a plurality of appliances for pasting such blanks, and a plurality of appliances for rolling up the pasted blanks to conical form, substantially as specified.

3. A machine for the purpose described comprising in combination a rotatable platen on which shaped blanks are placed, means for imparting rotary movement to such platen, a central screw, a slotted sleeve or column surrounding such screw, a nut engaging said screw and provided with wings engaging the slots in the sleeve or column to which wings the platen is secured, means for applying paste to the blanks and means for rolling the pasted blanks to conical form, substantially as specified.

4. A machine for the purpose described comprising in combination, a continuously rotating platen on which piles of shaped blanks are placed, such platen being capable of rising automatically to accommodate itself to the decreasing height of the piles of blanks thereon, a pinion and gear wheel for imparting a rotary movement to such platen, means for automatically raising such platen, means for lowering such platen when necessary, means for positioning the blanks thereon comprising a back support or fence and side guides adjustably carried by the gear wheel by which rotary movement is imparted to the platen, such side guides passing through slots in the platen, means for applying paste to the blanks, and means for rolling the pasted blanks to conical form, substantially as specified.

5. A machine for the purpose described comprising in combination a rotatable platen on which shaped blanks are placed, means for imparting rotary movement to such

platen, means for positioning the blanks thereon, means for applying paste to such blanks comprising a conical pasting roller and a conical feed roller rotating in contact therewith, means for imparting continuous rotary motion to the pasting roller, a reservoir of paste or the like supported above such rollers and so formed that the open bottom thereof is closed by them, and means for rolling the pasted blanks to conical form, substantially as specified.

6. A machine for the purpose described comprising in combination a rotatable platen on which shaped blanks are placed, means for imparting rotary movement to such platen, means for positioning the blanks thereon, a horizontal shaft, mechanism for applying paste to such blanks comprising rollers and a reservoir the whole of which are mounted in bearings on such horizontal shaft so that such mechanism is free to turn in relation thereto and can if desired be reversed, and means for rolling up the pasted blank, substantially as specified.

7. In a machine for the purpose described the combination of a rotatable platen on which shaped blanks are placed, means for imparting rotary movement thereto, means, mounted in bearings on a horizontal shaft, for applying paste to the blanks, a central screw rotatable independently of the platen, a cam carried by such central screw for controlling the contact of the pasting mechanism with the blanks, and means for rolling up the pasted blanks, substantially as specified.

8. In a machine for the purpose described the combination of a rotatable platen, means for imparting rotary movement thereto, a central screw, a slotted sleeve or column surrounding such screw, a nut engaging the screw and provided with wings engaging the slots in the sleeve or column and to which wings the platen is secured, a pasting mechanism, and means for controlling the height of the platen in accordance with the level of the blanks carried thereby, such means comprising a friction disk carried by the central screw, and a foot piece of the pasting mechanism adapted to press more heavily on the friction disk as the height of the pile of blanks decreases.

9. In a machine for the purpose described the combination of a rotatable platen, means for imparting rotary movement thereto, a horizontal shaft, means mounted in bearings on such horizontal shaft, for applying paste to the blanks, a foot piece for such pasting means, a central screw rotating independently of the platen, a nut working on such screw and to which the platen is secured, a friction disk mounted on the plain upper end of the central screw and on which friction disk the foot piece of the pasting mechanism bears, substantially as specified.

10. In a machine for the purpose described, the combination of a platen for supporting the blanks, means for imparting bodily rotation to the platen, a tiltably mounted pasting mechanism for applying paste to the blanks during bodily rotation of said platen, threaded means at the axis of rotation of said platen for automatically raising the same during rotation thereof in accordance with the changing height of the pile of blanks, means for operating the pasting mechanism, and devices operatively connecting said last named means with said threaded means for returning said platen to its lowermost position when the pasting mechanism is tilted, substantially as described.

11. A machine for the purpose described comprising in combination, a continuously rotating platen on which shaped blanks are placed, such platen being capable of rising automatically to accommodate itself to the decreasing height of the piles of blanks thereon, means for imparting a rotary movement to such platen, means at the axis of rotation of such platen for automatically raising such platen during rotation thereof, means for lowering such platen when necessary, means for applying paste to the blanks, means for rolling up such blanks comprising a conical roller through which a suction is produced at the point where same first comes in contact with the blanks to be rolled, and means for continuously rotating such roller, substantially as specified.

12. A machine for the purpose described comprising in combination a rotatable platen on which shaped blanks are placed, means for imparting rotary movement to such platen, means for applying paste to such blanks, means for rolling up such blanks comprising a plurality of conical rollers mounted in a single head, means for continuously rotating such rollers, and means for intermittently rotating the head whereby at each movement one roller will be brought into position for use and one which has just been in operation will be brought into position for the removal of the rolled blank, substantially as specified.

13. A machine for the purpose described comprising in combination a rotatable platen on which shaped blanks are placed, means for imparting rotary movement to such platen, means for applying paste to such blanks, means for rolling up such blanks comprising a plurality of conical rollers mounted in a single head, means for producing a suction through each of such rollers at the point where it first comes in con-

tact with the blank to be rolled, substantially as specified.

14. A machine for the purpose described comprising in combination a rotatable platen on which shaped blanks are placed, means for imparting rotary movement to such platen, means for applying paste to such blanks, means for rolling up such blanks comprising a plurality of continuously rotating conical rollers mounted in a single head, a sleeve on which such head is mounted, and means for intermittently rotating such head comprising a star wheel secured to the sleeve, rollers adapted to engage slots in such star wheel, and a rotating part of the machine on which such rollers are carried, substantially as specified.

15. A machine for the purpose described comprising in combination a rotatable platen on which shaped blanks are placed, means for imparting rotary movement to such platen, means for applying paste to such blanks, means for rolling up such blanks comprising a plurality of continuously rotating conical rollers mounted in a single head, a sleeve on which such head is mounted, and means for intermittently rotating such head comprising a star wheel secured to the sleeve, rollers adapted to engage slots in such star wheel, a rotating part of the machine on which such rollers are carried, and a stop mechanism by which the star wheel and the rolling mechanism connected therewith will be brought to rest in their proper positions and locked in such positions until the star wheel is again about to be operated, substantially as specified.

16. A machine for the purpose described comprising in combination, a continuously rotating platen on which shaped blanks are placed, such platen being capable of rising automatically to accommodate itself to the decreasing height of the piles of blanks thereon, means for imparting rotary movement to such platen, means at the axis of rotation of said platen for automatically raising such platen during rotation thereof, means for lowering such platen when necessary, means for applying paste to the blanks, means for rolling up such blanks comprising a conical roller, and a stripper by means of which the rolled blank is released from such roller, substantially as specified.

In testimony whereof I affix my signature in presence of two witnesses.

ELMER ZEBLEY TAYLOR.

Witnesses.

RAY BALL,

ROSE FEUERLIGHT.