L. E. WILLIAMS, SR., AND F. A. ADAMSKI.

APPARATUS FOR PASTING DRY CELL LININGS.

APPLICATION FILED APR. 6, 1916.

1,366,046. Patented Jan. 18, 1921.

2 SHEETS—SHEET 1.

FIG. 1

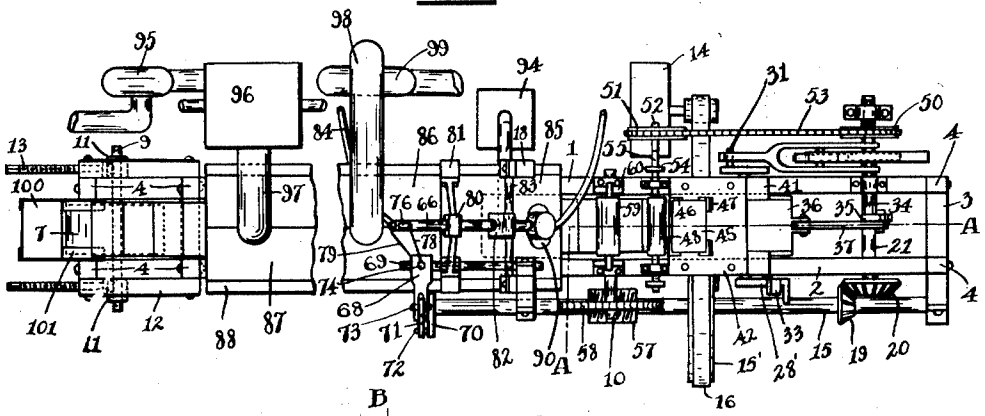


FIG. 2

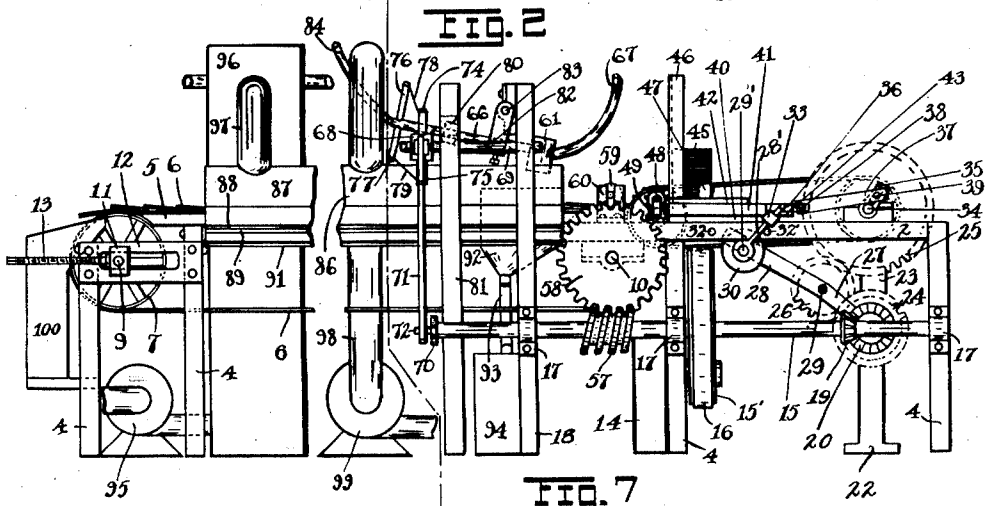
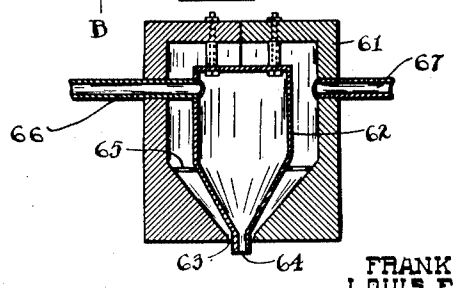


FIG. 7



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2 SHEETS—SHEET 2.

Fig. 3

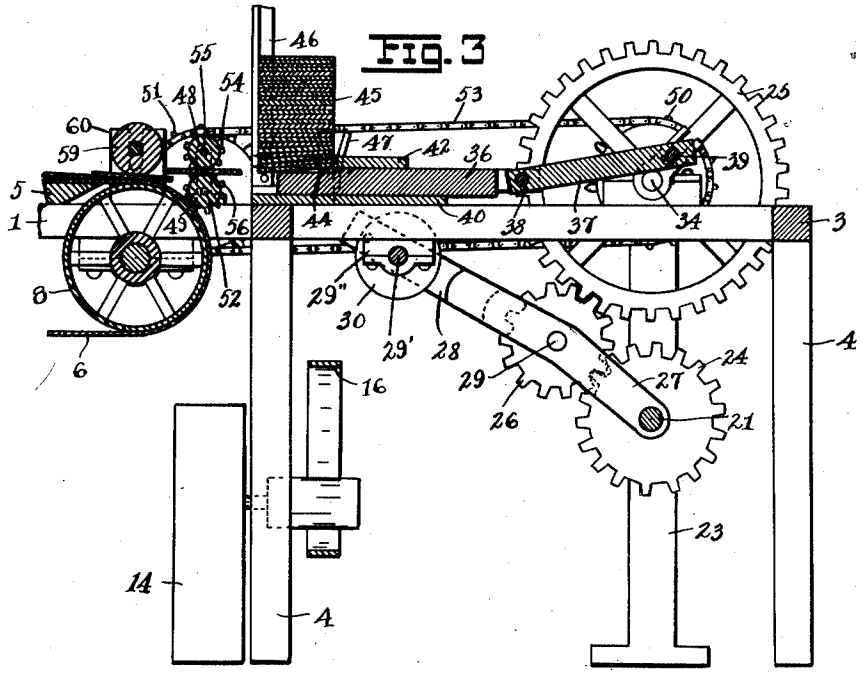


Fig. 4

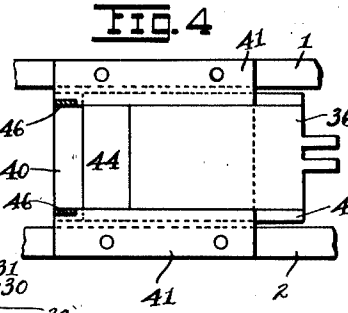


Fig. 5

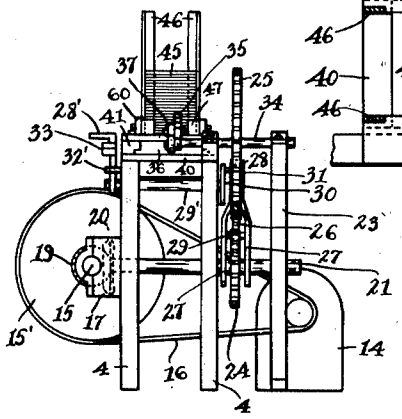
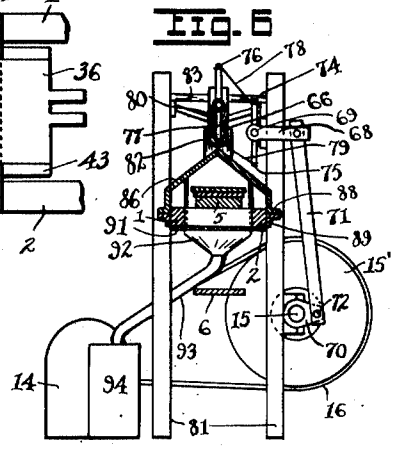


Fig. 6



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UNITED STATES PATENT OFFICE.

LOUIS E. WILLIAMS, SR., AND FRANK A. ADAMSKI, OF FREMONT, OHIO, ASSIGNORS, BY MESNE ASSIGNMENTS, TO NATIONAL CARBON COMPANY, INC., A CORPORATION OF NEW YORK.

APPARATUS FOR PASTING DRY-CELL LININGS.

1,366,046. Specification of Letters Patent. Patented Jan. 18, 1921.

Application filed April 6, 1916. Serial No. 89,387.

To all whom it may concern:

Be it known that we, LOUIS E. WILLIAMS, Sr., and FRANK A. ADAMSKI, citizens of the United States, residing at Fremont, in the county of Sandusky and State of Ohio, have invented a certain new and useful Improvement in Apparatus for Pasting Dry-Cell Linings, of which the following is a full, clear, and exact description.

This invention relates to a method of and apparatus for applying flour paste to the lining of a dry cell. In the manufacture of dry cells of a well known type, a layer of paste made from flour and water is applied to a bibulous paper lining by means of a brush for instance. The pasted lining is placed in the zinc can either in a wet condition or after drying, and the mix is then tamped in the cell.

The paste applied in the above manner is streaked, and not uniform over the entire surface. When a lining pasted in this way is used in a cell it is found upon examination of the zinc container after several months, that its surface shows irregular corrosion corresponding to the irregularities of the paste.

To eliminate the disadvantages referred to, we have devised and illustrated apparatus for uniformly applying the flour paste to the linings.

Referring to the drawings:—

Figure 1 is a plan view of the apparatus with a considerable length of the central portions of the arrangement broken away.

Fig. 2 is a front view having the same portions omitted as in Fig. 1.

Fig. 3 is an enlarged cross section of the lining feed end taken on the line A—A of Fig. 1.

Fig. 4 is a detail view of a part of the slide for feeding the linings.

Fig. 5 is an end view taken from the right of Fig. 1.

Fig. 6 is a sectional view on the line B—B of Fig. 2.

Fig. 7 is a sectional detail view of the spraying nozzle.

The supporting arrangement consists of a suitable framework made up for example, of longitudinal members 1, 2 joined by cross pieces 3 and carried by supporting legs 4 placed at suitable distances along the longitudinal members. A support 5 is placed on top of the cross pieces to prevent sagging on the upper portion of a belt conveyer 6 which passes around two end pulleys 7 and 8. The pulleys are arranged respectively on shafts 9 and 10 and are placed intermediate to the longitudinal members 1, 2. To tighten the belt, shaft 9 is placed in bearings 11 adapted to be adjusted in slotted guides 12 by means of adjusting screws 13.

The driving means which operates the various parts in a manner to be set forth hereafter, consists of a motor 14 that rotates a drive shaft 15 and pulley 15′ through a belt 16. The bearings 17 for shaft 15 are fastened in a suitable manner to legs 4 (Fig. 2) and to one of a pair of supporting legs 18 extending above the longitudinal members 1, 2 for a purpose to be described later. A bevel gear 19 on shaft 15 meshes with bevel gear 20 on one end of a shaft 21 carried in standards 22, 23. The rotation of shaft 21 turns a pinion 24 thereon and drives a gear 25 through an intermediate idler 26. The idler is mounted between the prongs 27, 27 of a fork 28 and rotates on an axis 29. Shaft 21 passes through openings in the ends of the prongs and the other end of the fork 28, together with the idler 26, may be turned around the shaft 21 to enable the idler to be thrown in or out of mesh with gear 25 while maintaining it always in engagement with gear 24. For this purpose a lever 28′ is fitted on one end of a shaft 29′ having bearings 29″ attached to the under side of the horizontal members. At the other end of the shaft is placed a crank 30 having a pin 31 engaging an opening in the end of the fork. The throw of the lever 28′ is limited by means of pins 32, 32′, and a weight 33 is affixed to the lever to maintain it adjacent either pin.

Gear 25 rotates on a shaft 34, one bearing of which is arranged on the horizontal member 1, while the other is in the upper end of standard 23. A crank arm 35 is keyed on the end of shaft 34 and fastened to a slide 36 by means of a connecting rod 37 and pins 38 and 39. The guideway for the slide consists of a lower plate 40, side members 41, a top member 42 and in addi-

tion the slide has projecting ridges 43 which move in corresponding slots in the sides. The feeding end of the slide has a depression 44 of a depth corresponding with the thickness of the linings.

The linings are fed by the slide from a stack 45 and are alined in proper position over the slide by two angle irons 46 and two flaring guides such as the split irons 47.

The linings are fed by the slide between a pair of rolls 48, 49, rotated in opposite directions by a driving mechanism consisting of a toothed wheel 50 on shaft 34 and a toothed wheel 51 on axis 52 of roll 49 and a chain 53 in engagement with the toothed wheels 50 and 51. The second roll 48 is driven from the first by means of a gear 54 on shaft 55 meshing with a gear 56 on axis 52.

The means for moving the conveyer consists for instance, of a spiral gear 57 on the drive shaft 15, meshing with a gear 58 on the shaft 10. A small roller 59 is placed vertically over pulley 8, and has protruding ends slidable in guides 60 attached to the horizontal members.

The paste sprayer as shown in Fig. 7 consists of two spaced casings 61, 62 each tapering at the outlets 63, 64. The two are maintained in a spaced relation by any suitable means such as the perforated ring 65. A tube 66 passing through both casings feeds paste into the inner casing and a second tube 67 feeds air into the outer casing. The direction of the spray is inclined to the horizontal so that the overlapped portions are not subjected to the force of the sprayer which would tend to move or blow the linings out of position and expose the overlapped portion to the spray. The sprayer is moved from side to side to spread the spray evenly over the entire lining. The spray oscillating mechanism consists of a double bell crank member 68 which is turned through a certain angle around an axis 69 by means of the rotating crank 70, connecting rod 71 and pins 72 and 73. The bell crank has two oppositely projecting arms 74, 75 which are connected with a pair of oppositely projecting arms 76, 77 on the tube 66. The arms 74, 76 are connected by a cord 78 and arms 75, 77 are similarly connected by a cord 79. Bearings for the tube consist of a support 80 fastened between uprights 81 and a swinging bearing 82 suspended from an axis 83 attached to the uprights 18. A flexible hose 84 is attached to the end of the tube 66 to feed paste thereto.

Upon the horizontal members 1, 2 are placed a number of sections of hoods 85, 86, 87 which have projecting flanges 88 secured to an angle iron 89. A suitable opening 90 is provided in hood 85 for the sprayer and the end adjacent the lining feed is closed by an end member having an opening adapted to allow the passage of plank or support 5, belt 6 and the linings. The opposite end of hood 76 is similarly closed. To completely incase the conveyer, plates 91 may be fastened to the under side of the longitudinal supports.

The paste not deposited on the lining will be removed by means of the drain box 92 and pipe 93 to the tank 94 arranged as shown in Figs. 1, 2 and 6.

Although for purposes of illustration we have shown only a relatively short section of hoods, it will be understood that the section broken away is of sufficient length to permit the linings to be dried. This will be facilitated by forcing air taken in by a fan 95 through an air heater 96 and then through a pipe 97 into the conveyer casing. The air will then be removed by means of a pipe 98 and fan 99 located at the other end of the casing. The linings move in a direction opposite to the direction of the air current.

After being dried, the linings pass through the end of the casing and slide down strips 101 into a receptacle 100 as the belt passes over the end pulley 7.

To place the apparatus in operation, the air heater 96 and fans 95, 99, will be started, thus drawing air from heater through the conveyer casing to fan 99. A stack of linings 45 will be placed between the guideways 46, 47 and the motor 14 started. By throwing lever 28′ to the position shown in Fig. 2 the lining feed will be driven from the main shaft 15 through bevel gears 19, 20, thus placing shaft 21 and gear 25 in rotation. The movement of the lever 28′ turns shaft 29 and pin 31 through a certain angle and raises the fork 28 and idler 26 into engagement with the large gear 25, which operates the lining feed shaft 34. Each rotation of this shaft will operate the slide 36 to remove one lining from the base of the pile and will move it far enough forward to cause it to be engaged by the rollers 48, 49. The rollers are driven from the same shaft as the lining feed mechanism through toothed wheels 50, 51, chain 53 and gears 54, 56. The linings are carried by the rollers to a point where they will be received between the belt conveyer 6 and the roller 59. The movement of the conveyer is produced through the spiral gear drive consisting of spiral 57 and gear 58 on the shaft 10 of pulley 8. The roll 59 is rotated by frictional engagement with the linings on the conveyer belt. In the present case it is not necessary to apply paste to one edge of the lining because when the jacket is coiled in the cell the upper end is turned in to cover the mix after it is tamped in the container. The timing of the various operations will therefore be such that a lining does not pass

entirely through the space between roller 59 and belt 6 until the front end of the succeeding lining is deposited thereon.

To prevent covering the belt with paste this will not be fed to tube 66 until the linings have gotten under the sprayer 61. The paste will be very finely divided by the sprayer and will be uniformly distributed by its movement from side to side. This movement is produced by the rotation of the crank 70 which turns the toggle 68 and the arms 74, 75 through a certain angle, and this movement will in turn be transmitted to arms 76, 77 through the connecting cords 78, 79. The excess paste will be withdrawn through the drain 92 to tank 94. After passing the sprayer the linings are dried by the heated air current produced in the manner already described. It is not essential in the operation of the apparatus to use either of the fans, if the belt conveyer is long enough, as the linings could then be dried in the open air.

When the linings pass over the pulley 7 they slide down the inclined strips 101 into the box 100.

In the preceding description certain apparatus has been described for carrying out our invention, but it will be evident that different mechanical equivalents may be used without departing from the spirit of our invention. While we have described the paste sprayer as using flour paste and air with a certain type of sprayer, it is not essential to use these two materials or to mix the materials in the particular manner described, as the paste may be atomized by steam or by mechanical means.

Having described our invention, what we claim is:—

1. In apparatus for coating dry cell linings, a movable conveyer, a sprayer for applying coating material to the linings, means for retaining a stack of linings, a reciprocating slide for feeding a lining from the stack and a pair of rollers for depositing linings on the conveyer at a rate such that the linings overlap.

2. In apparatus for coating dry cell linings, a supporting frame, a source of supply for liquid coating material, a sprayer attached to the frame, a guide for a pile of linings, a continuously moving conveyer, a pair of rotating rollers for depositing linings from the the guide to the rollers, a slide for feeding linings thereto at a rate such that the linings overlap, and means for moving the conveyer and linings past the sprayer.

3. In apparatus for coating dry cell linings, a conveyer for the linings, means adapted to place linings on the conveyer with an edge of one lining overlapping an edge of an adjacent lining, and a sprayer for applying coating material to the linings, said sprayer being inclined so that the force of the spray is directed away from the overlapped edge.

4. In apparatus for coating dry cell linings, means for retaining a stack of linings, a conveyer for the linings, a sprayer for applying coating material, a reciprocating slide adapted to remove a lining from the stack and feed it to the conveyer, said conveyer moving at such a rate in relation to the reciprocation of the slide that one lining overlaps the other on the conveyer whereby an uncoated edge is provided on the lining, and means for moving the conveyer and lining past the sprayer.

5. In apparatus for coating articles whereof part of the surfaces are to be left uncoated, a sprayer and means for conveying the articles successively past the sprayer with their adjacent ends overlapping to the extent to which the overlapped article is to be left uncoated, said sprayer being disposed at an acute angle to the plane of travel of the articles and arranged to direct the coating material onto the articles away from the points of contact of the overlapping edges.

6. In apparatus for coating articles whereof part of the surfaces are to be left uncoated, a sprayer, means for conveying the articles successively past the sprayer with their adjacent ends overlapping to the extent to which the overlapped article is to be left uncoated, said sprayer being disposed at an acute angle to the plane of travel of the articles and arranged to direct the coating material onto the articles away from the points of contact of the overlapping edges, and means for oscillating the sprayer.

In testimony whereof we hereunto affix our signatures.

LOUIS E. WILLIAMS, Sr.
FRANK A. ADAMSKI.