

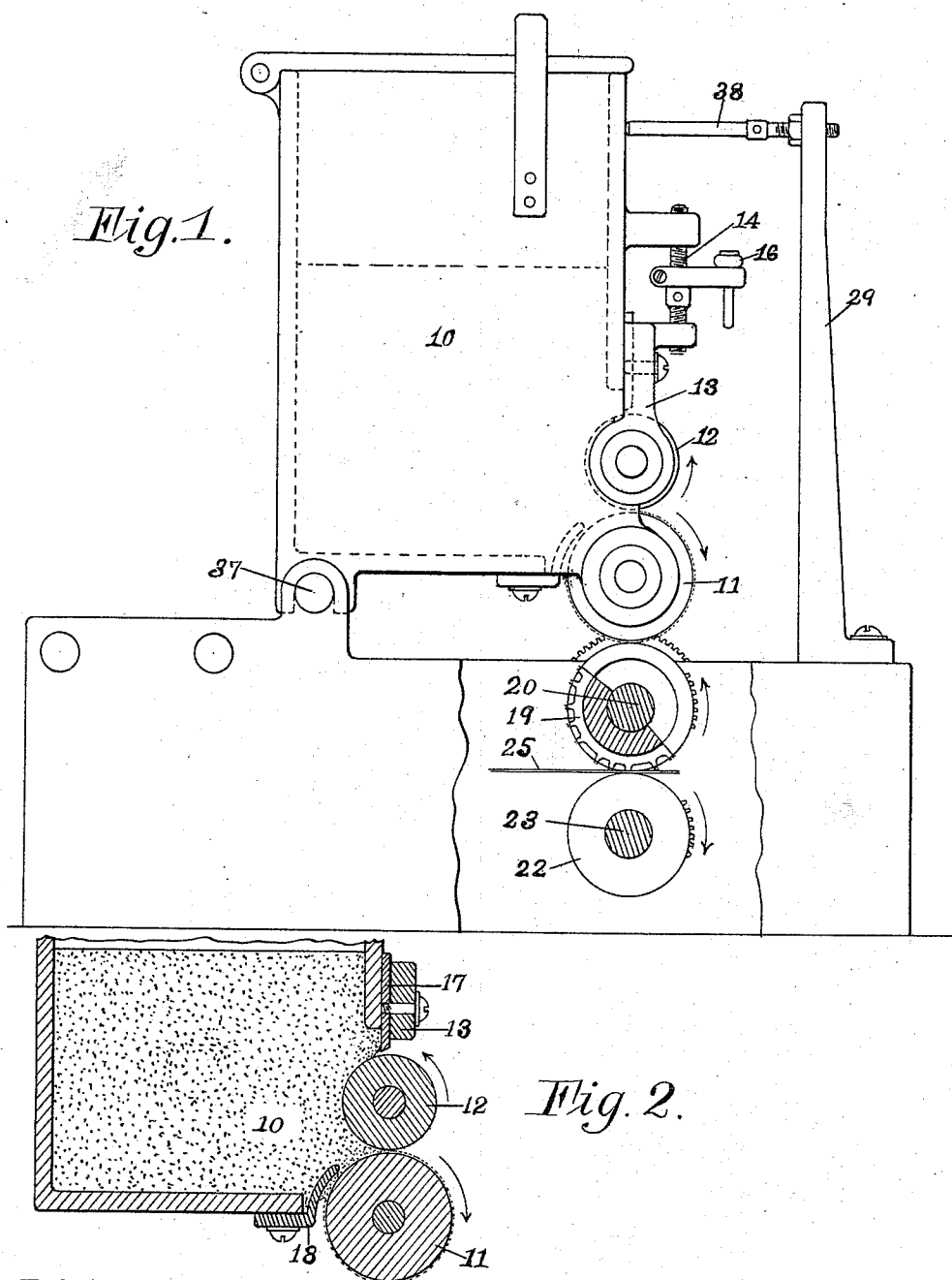
(No Model.)

4 Sheets—Sheet 1.

W. H. HONISS & W. A. LORENZ.
MACHINE FOR APPLYING PASTE TO PAPER, &c.

No. 571,527.

Patented Nov. 17, 1896.



(No Model.)

4 Sheets—Sheet 2.

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Fig. 3.

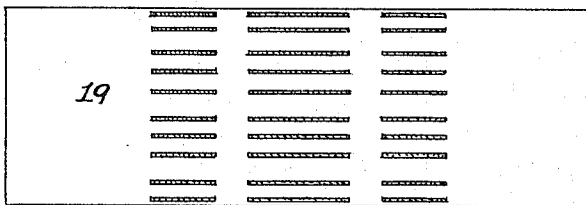
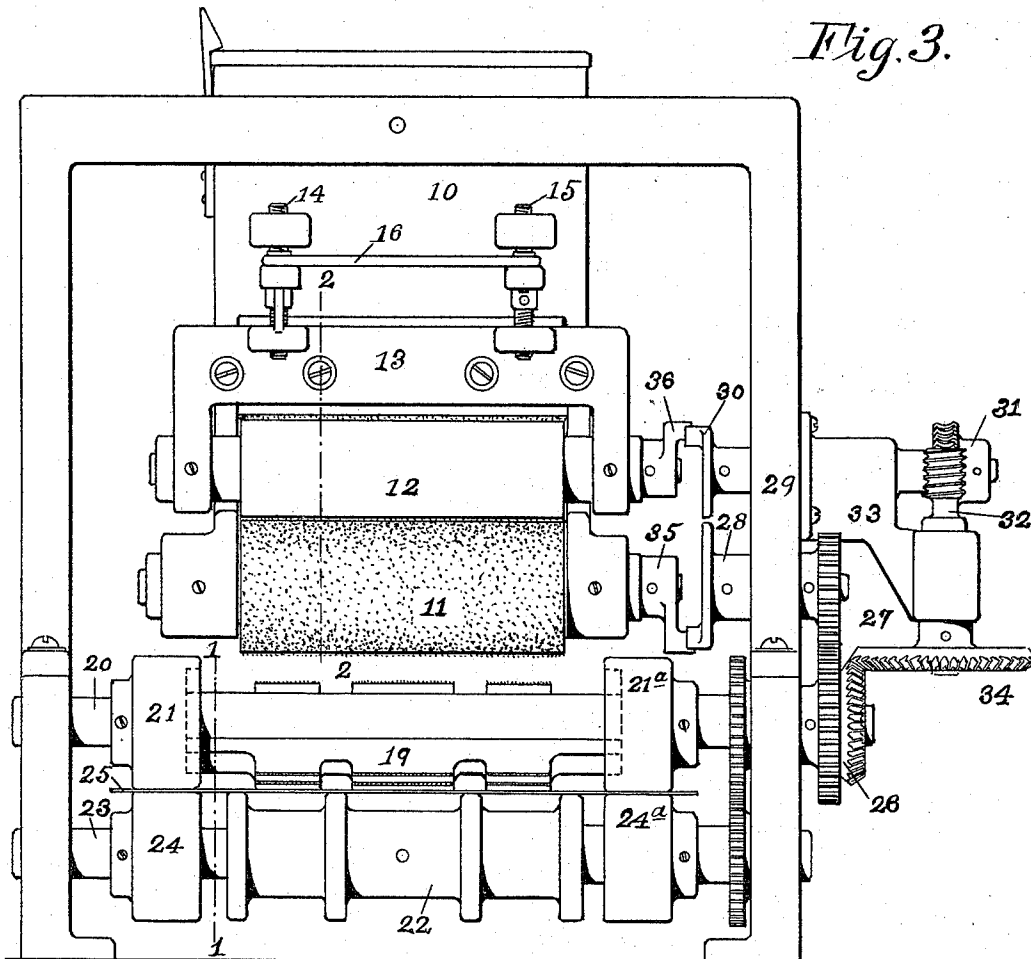


Fig. 4.

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Fig. 5.

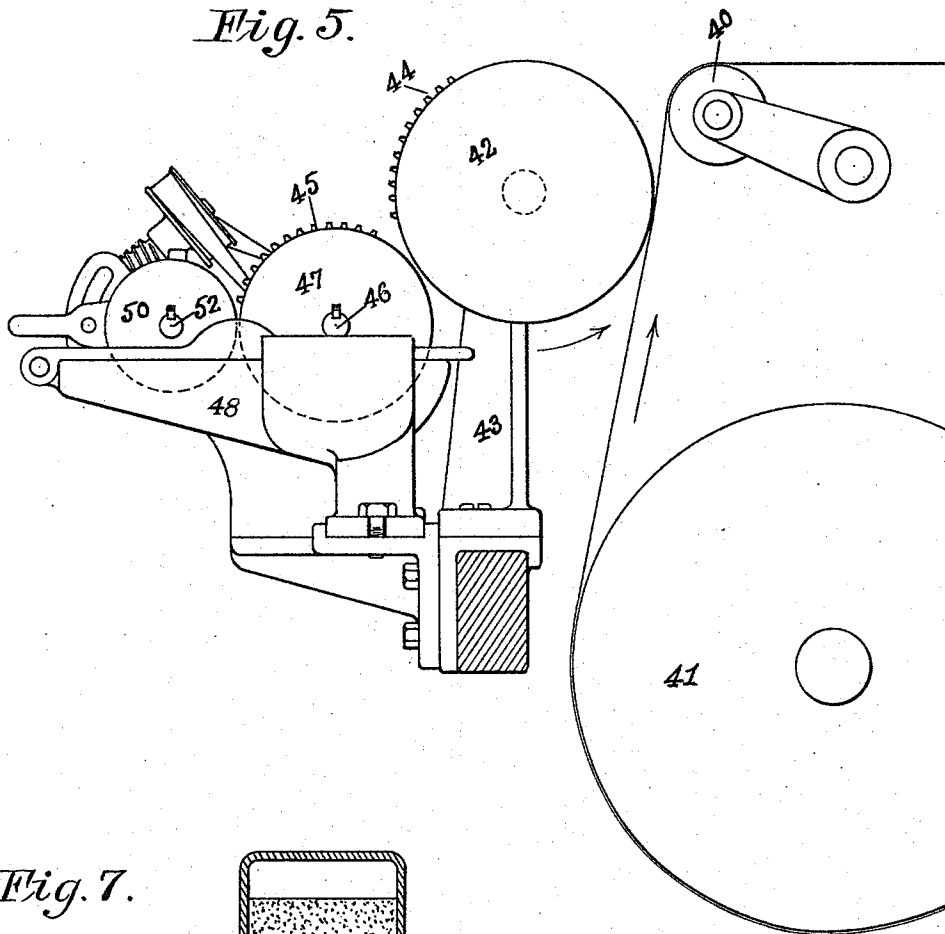


Fig. 7.

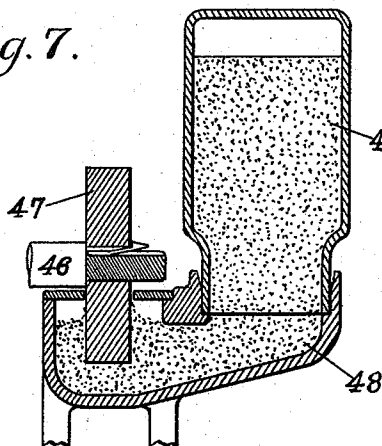
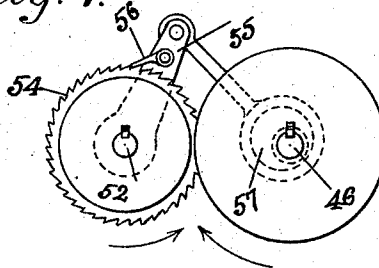


Fig. 9.



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(No Model.)

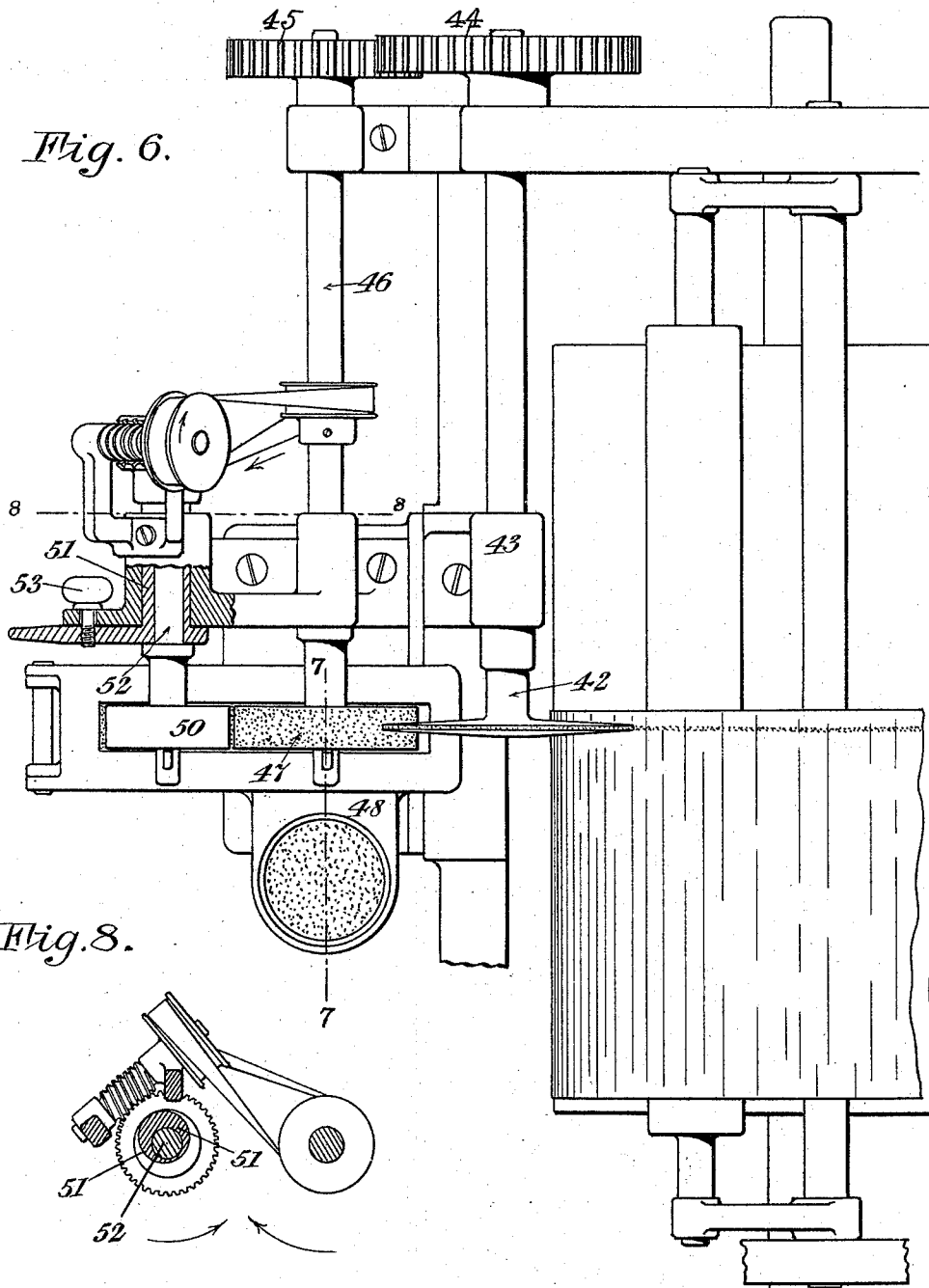
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Fig. 6.



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UNITED STATES PATENT OFFICE.

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MACHINE FOR APPLYING PASTE TO PAPER, &c.

SPECIFICATION forming part of Letters Patent No. 571,527, dated November 17, 1896.

Application filed May 31, 1895. Serial No. 551,146. (No model.)

To all whom it may concern:

Be it known that we, WILLIAM H. HONISS and WILLIAM A. LORENZ, citizens of the United States, residing at Hartford, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Machines for Applying Paste to Paper, &c., of which the following is a full, clear, and exact specification.

10 This invention relates to an improved apparatus for depositing lines of paste upon paper or any other material which it is desired to paste together, in such a way that the lines or spots of paste shall be deposited
15 exactly where required, and of the desired width and volume throughout. It comprises means whereby the paste may be deposited in any desired pattern, or so as to cause certain portions of the fabric to be pasted together, leaving other portions unpasted.

20 The invention relates also to means for so regulating the flow of the paste from the vat or other vessel in which it is contained that it shall be evenly distributed upon the rolls or
25 other devices for applying the paste to the fabric to be pasted.

A well-known difficulty in the various methods of applying paste is that of so gaging the supply of paste that it shall be distributed uniformly. The usual method of regulating the supply of paste is to employ a fixed gage in a suitable relation to the roll, so that the paste taken up by the roll is scraped off by the fixed gage, leaving a film of the desired thickness upon the roll. In practice, however, several objections are found to a fixed gage. The paste usually contains lumps or foreign substances, which, becoming wedged between the gage and the roll, clog the flow of the paste and thus cause it to be deposited in irregular lines upon the roll. Even when the paste is strained and is of a proper consistency for use there is a tendency for it to dry upon the paste-gage and thus gradually to close up the opening between the gage and the roll. These faults are very serious in any pasting apparatus that is employed in connection with fast-running automatic machinery, inasmuch as the
50 checking of the supply of paste often operates to spoil a large quantity of the work by

insufficient pasting before the trouble is noticed and remedied. To obviate these difficulties and to provide a reliable and accurate pasting apparatus which may be employed with thick and lumpy paste, which will prevent the clogging of the gage, and which will roll out and carry away the lumps are the objects of this invention.

Figure 1 of the drawings is an end view, partly in section on the line 1 1 of Fig. 3, of our invention adapted to the application of transverse lines of paste, and represents a paste-box with suitable rollers connected therewith. Fig. 2 is an end view of the lower portion of the paste-box in section, taken on the line 2 2 of Fig. 3, showing the two principal rolls. Fig. 3 is a front view of what is shown in Fig. 1. Fig. 4 is a plan view of a removable "turtle" such as we employ in connection with the apparatus. Fig. 5 is an end view of a modification of this invention adapted to apply lines longitudinally upon a web or traveling sheet of paper. Fig. 6 is a plan view of what is shown in Fig. 5. Fig. 7 is a cross-sectional view taken on the line 7 7 of Fig. 6. Fig. 8 is a cross-sectional view taken on line 8 8 of Fig. 6. Fig. 9 represents a modified arrangement of the devices for rotating the paste-rolls, wherein they are operated by an intermittent motion.

The numeral 10 represents a paste-box suitably mounted adjacent to the work upon which the paste is to be applied, having journaled thereon the paste-feeding roll 11. The gaging-roll 12 is journaled in the frame 13, which is mounted upon the paste-box 10 and is adjusted toward or from the feeding-roll 11 by means of the screws 14 and 15. These screws are connected together by suitable arms and connecting-rods 16, which insure equal motion of the two screws, so as to keep the gaging-roll 12 parallel with the feeding-roll 11 in all positions to which it may be adjusted. A valve 17 is adjustably attached to the frame 13 by means of the screws shown, and a similar valve 18 is also adjustably attached to the frame of the paste-box 10. The turtle 19 is adjustably secured to the shaft 20 by means of the roll-collars 21 and 21^a, and the lower roll 22 is secured to the shaft 23, upon which are also fixed the rolls 24 and 24^a,

adapted to engage with the rolls 21 and 21^a, respectively. The shafts 20 and 23 are journaled in the frame of the machine and are so situated with relation to the rest of the machine that the work to be pasted, which is represented by the numeral 25, can be conveniently passed between them. These shafts are geared together, and the upper shaft 20 has fixed upon it the gear 26, composed of a spur and a bevel portion, the former of which engages with the spur-gear 27, as best seen in Fig. 3. The gear 27 is fixed upon the stem of the carriage 28, which extends through and is journaled in the frame 29. A similar carrier 30, also journaled in the frame, extends through and has fixed upon its outer end the worm-gear 31, which is adapted to engage with the worm 32. That worm is journaled in the bracket 33 and has fixed upon its lower end the bevel-gear 34, which engages with the bevel portion of the double gear 26. This gearing is so arranged that the carrier 30 is caused to rotate in a direction opposite to that of the carrier 28 and at a very much lower rate of speed than that carrier. The rolls 11 and 12 have fixed upon their right-hand ends, as seen in Fig. 3, the dogs 35 and 36, respectively, and the centers of those rolls are so located that their axes approximately coincide with the axes of the carriers 28 and 30 by which they are respectively driven. The paste-box 10 is preferably pivotally mounted upon the lower frames at the point 37 and may be adjustably moved upon that pivot by means of the screw 38 in the frame 29, so as to bring the feeding-roll 11 into suitable relation to the periphery of the turtle 19.

The function of the valves 17 and 18 is to regulate the width of the openings adjacent to the ingoing side of the rolls 11 and 12, and those valves are adjusted in relation to the roll, so as to permit the surplus paste that has been carried out between the rolls to pass into the box again. We have discovered after many experiments that the operation of these parts when thus arranged is to carry back into the box the paste that seeks to ooze out of those openings.

The function of the rolls 21 21^a and the rolls 24 24^a is to carry forward between them the work 25 to be pasted, while the roll 22 serves to support the work and hold it in suitable contact with the turtle as it is carried through. The rolls 21 21^a serve also as collars to clamp the turtle to its proper place on the shaft 20.

The modified arrangement of devices shown in Figs. 5 to 9, inclusive, is one which adapts this invention to the feeding and applying of paste in longitudinal lines, as in a paper-bag machine or in a newspaper printing-press.

The sheet or web of paper to be operated upon is passed over the roll 40 from the roll 41, which may represent a roll of paper or a guiding-roll over which the paper is drawn. The upper wheel 42 is journaled in the

bracket 43 in suitable relation to the passing web and has fixed upon its outer end the gear 44, which meshes with the gear 45, fixed on the shaft 46, upon the opposite end of which is carried the feeding-roll 47. That roll may be fixed upon the shaft 46 or may be removably carried thereon, as shown in Fig. 7. A paste-vat 48 is so located as to allow the feeding-roll 47 to be partially immersed therein. It may be provided with the reservoir 49, which also serves to keep the paste free from dust and other impurities. A gaging-roll 50 is located adjacent to the feeding-roll 47, so that it is also partially immersed in the paste, and is preferably carried on a shaft 52, journaled in an eccentric bearing 51, so as to allow of adjusting the gaging-roll toward and from the feeding-roll. This bearing may be clamped in any of its adjusted positions by means of the thumb-screw 53. The gaging-roll shaft 52 may be driven by a worm and worm-gear, as shown in Figs. 6 and 8, or by any other suitable reducing motion, and may receive its motion from the shaft 46 or from any other convenient moving shaft.

The paste-vat 48 is preferably so attached to the machine that it may be readily removed, as shown in Fig. 5, for washing or refilling.

For some purposes an intermittent or step-by-step motion for the gaging-roll may be preferable for either of the two adaptations herein shown, and this is secured by the construction shown in Fig. 9, in which the shaft 52 has fixed upon it the ratchet-wheel 54 and has loosely mounted upon it the arm 55, provided with the pawl 56, which engages with the ratchet-wheel 54. An oscillatory motion imparted to the arm 55 by means of the eccentric 57 on the shaft 46, or upon any convenient shaft, operates to advance the wheel one or more notches at a stroke.

We are aware that paste-feeding rolls have been provided with a slower-moving gaging-roll to regulate the paste supply, but in all such instances known to us the ratio of movement of the gaging-roll has been not less than one-half that of the feeding-roll. In the course of many experiments made by us in connection with this problem we have discovered that in order to have them work satisfactorily the surface-speed of the gaging-roll to that of the feeding-roll should be not more than one to fifty, varying to one to one hundred, according to the thickness of the paste used. When the two rolls are driven at any closer relation than that of one to fifty, their operation is unsatisfactory, the paste adhering to each of them in something like the ratio of their relative surface-speeds, not smoothly, however, but drawn into irregular circumferential ridges of ever-varying width, thickness, and position, so that it is impossible to take off from the feeding-roll a line of paste of uniform volume throughout. It was also very difficult to determine the extent to which

the gage should be opened to supply the required amount on the feeding-roll, inasmuch as the supply which was allowed to pass between the rolls was thus irregularly divided between them; but when the relative speed of the gaging-roll to that of the feeding-roll is reduced to the ratio of from one to fifty to one to one hundred we have found that practically none of the paste adheres to the slower-moving gaging-roll, but all that is allowed to pass out between the rolls will adhere to the faster-traveling feeding-roll in a perfectly uniform film, which operates as a sort of wiper against the gaging-roll to keep it clean all the way across, so that scarcely a trace of the paste is discoverable thereon by rubbing the fingers upon the roll. It will readily be seen, therefore, that the gaging of the supply thus becomes a determinate and simple matter, since it all goes upon the roll where it is wanted.

Another characteristic of this invention, in which it differs materially from all other devices of its kind known to us, is in the partial immersion of the gaging-roll in the paste contained in the vat or reservoir. No such devices, so far as known to us, have been free from the objection that the paste was liable to dry and accumulate upon the gaging-roll. This does not occur in our device, by reason of the continual redampening of the roll by its immersion in fresh paste and the continual lapping action of the faster-traveling feeding-roll.

Since the amount and the distribution of paste upon the feeding-roll is determined by the size and contour of the opening between the rolls, it is evident that the distribution may be varied by altering the form of either of these rolls. By setting either one of the screws 14 15 slightly ahead of the other the corresponding end of the gaging-roll will be raised more than the other, and more paste will be left upon that end of the feeding-roll. This difference will be maintained throughout subsequent adjustments of the screws by means of the connecting-rod 16.

The arrangement herein shown for attaching and adjusting the paste-box and its appurtenances in suitable relation to the rest of the machine is a most advantageous one. It is always desirable and indeed usually necessary to remove the pasting apparatus from the machine at noon and at night for the purpose of washing the vat and its rolls. By this arrangement the box may be thus removed and washed and may be replaced again when desired in exactly its former position with relation to the machine without the use of wrenches or other tools. All of the parts thus removable for the purpose of

washing are preferably made in brass in order that they shall not rust by reason of the frequent washing in water.

Other well-known mechanism may be employed for reducing the relative speed of the gaging-roll to that of the feeding-roll in place of the worm and wheel shown herein, as, for instance, by compound gearing, or by differential gearing, or by various systems of belts and reducing-pulleys. We, however, prefer the worm and wheel, as shown herein, as being the most simple and effective of the devices for this purpose known to us.

We claim as our invention—

1. In a paste-feeding device, a feeding-roll, and an adjacent gaging-roll, the rolls arranged to have the paste fed directly between them, the gaging-roll geared to rotate at so slow a speed relative to the feeding-roll as to cause substantially the entire film of paste passing between them to be smoothly retained on the paste-feeding roll, leaving the gaging-roll substantially dry, for the purpose specified.

2. A pasting device, consisting of a box adapted to hold a supply of paste, a feeding-roll and a slower-rotating gaging-roll journaled thereon, with their working surfaces entering an aperture in the box below the normal paste-level, substantially as described.

3. A pasting device, consisting of a box adapted to hold a supply of paste, a feeding-roll, and a slower-rotating gaging-roll journaled thereon, with their working surfaces entering an aperture in the box below the normal paste-level, the sides of the aperture adjacent to the peripheries of the rolls being provided with valves adjustable toward and from the surfaces of the rolls, for the purpose specified.

4. In combination with a machine for carrying and suitably presenting objects to be pasted, and provided with means for operating the pasting-rolls, the herein-described pasting device, consisting of a paste-box adapted to be removably supported on the machine, and having a pasting-roll and a slower-moving gaging-roll journaled thereon, each provided with suitable arms or carriers adapted to engage with corresponding actuating arms or carriers of the machine, substantially as described.

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