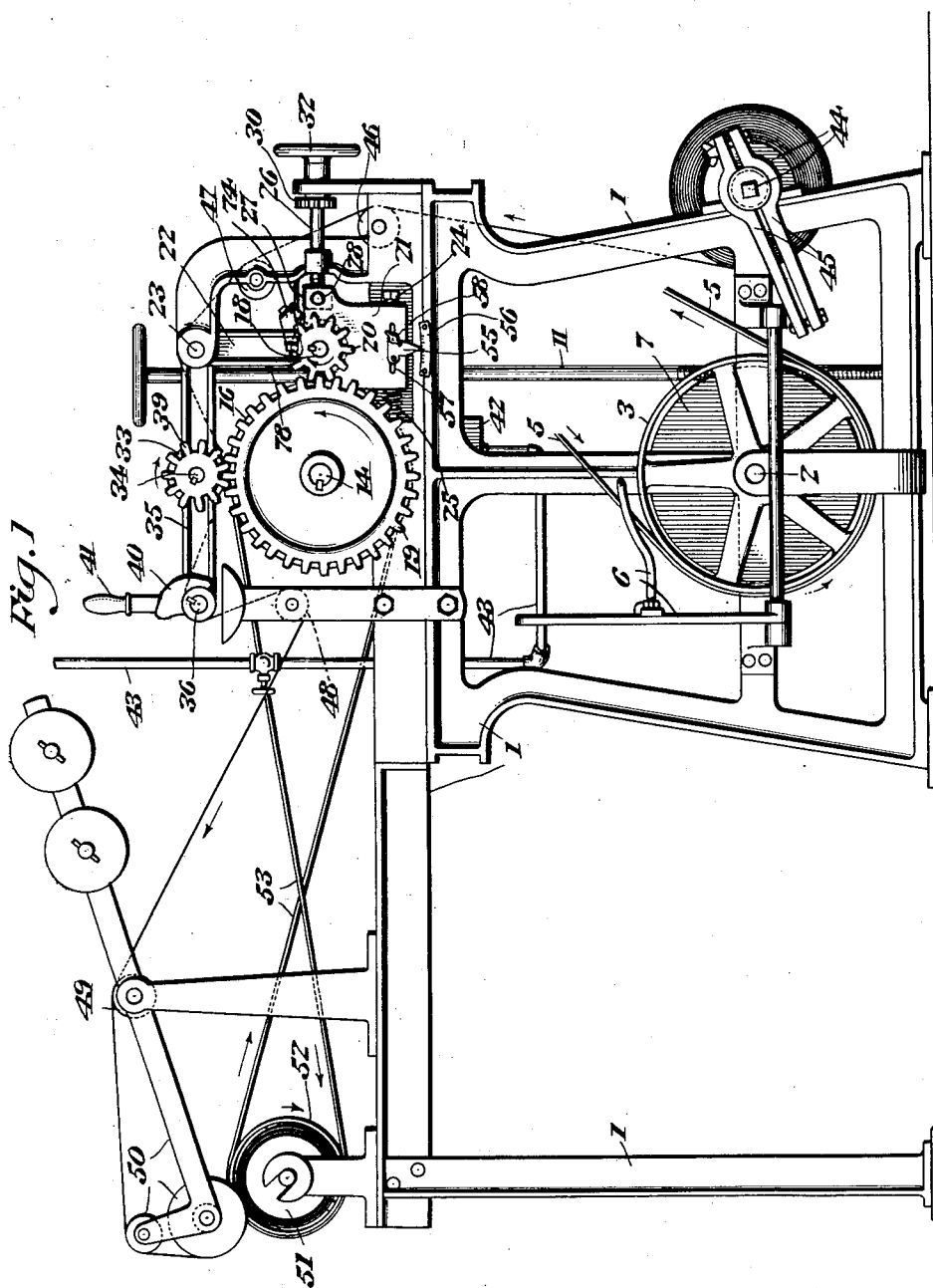


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3 SHEETS—SHEET 1.

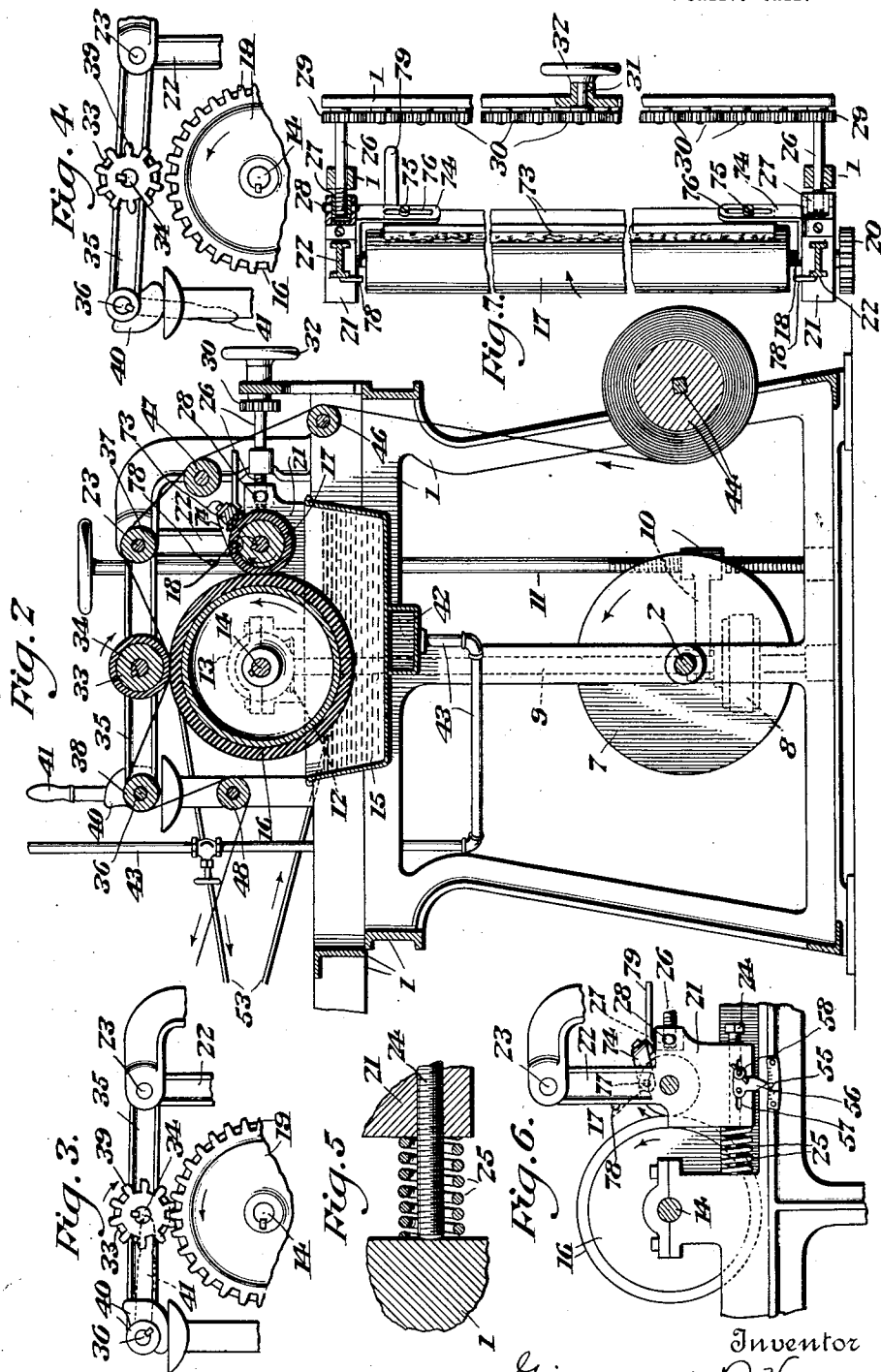


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1,347,066.

Patented July 20, 1920.

3 SHEETS—SHEET 2.



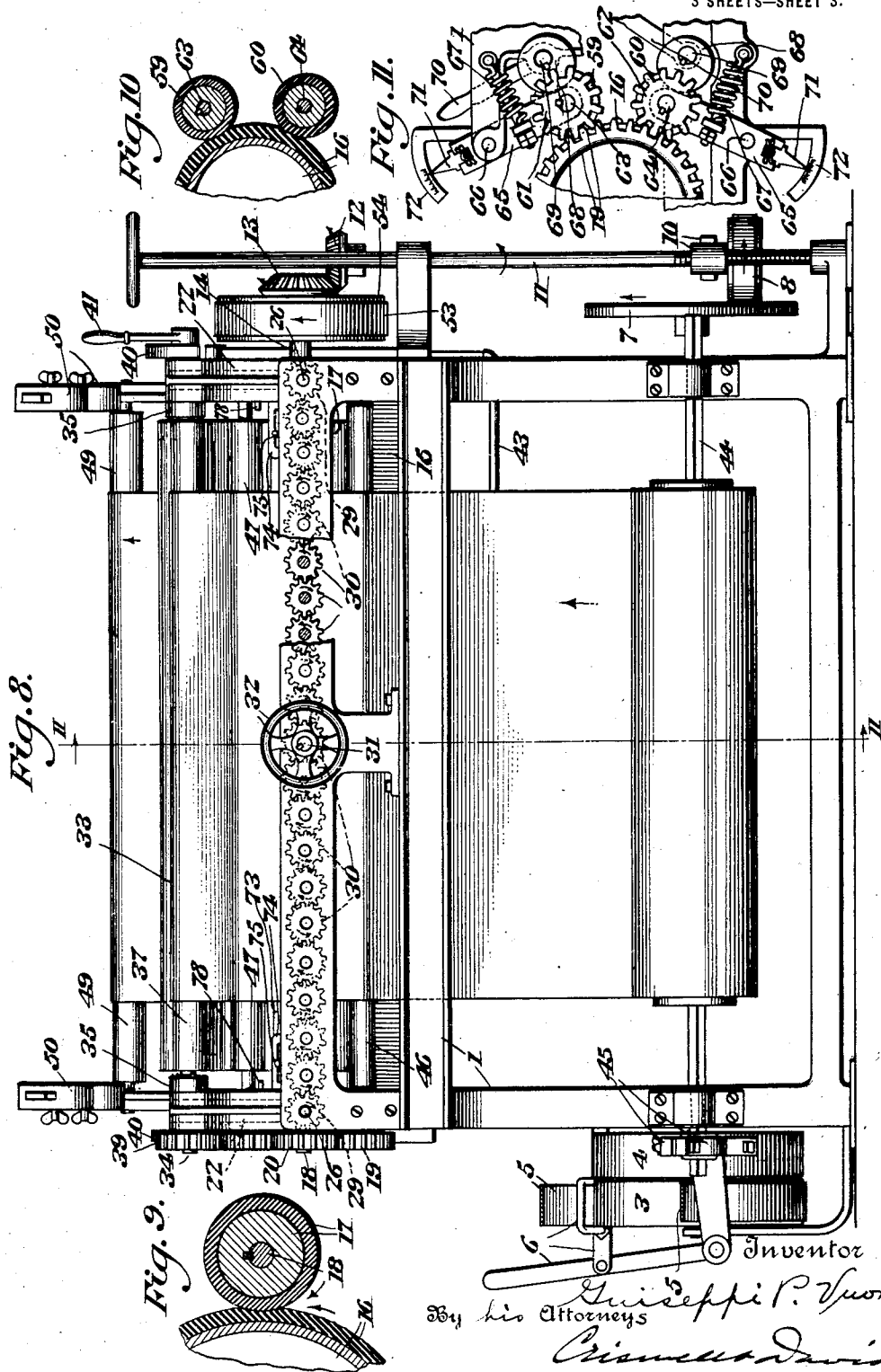
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1,347,066.

G. P. VUONO.
SILK FINISHING MACHINE.
APPLICATION FILED JUNE 30, 1919.

Patented July 20, 1920.

3 SHEETS—SHEET 3.



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UNITED STATES PATENT OFFICE.

GIUSEPPI P. VUONO, OF BROOKLYN, NEW YORK.

SILK-FINISHING MACHINE.

1,347,066.

Specification of Letters Patent.

Patented July 20, 1920.

Application filed June 30, 1919. Serial No. 307,679.

To all whom it may concern:

Be it known that I, GIUSEPPI P. VUONO, a citizen of the United States, and a resident of the borough of Brooklyn, county of Kings, and State of New York, have invented certain new and useful Improvements in Silk-Finishing Machines, of which the following is a specification.

This invention relates to machines for finishing silk fabrics and has for its general object the provision of a machine which may be readily and accurately adjusted to apply the exact quantity of finishing paste to the fabric necessary to give the fabric a desired finish.

Another object of the invention is to provide an improved construction of paste delivering and applying means adjustable to regulate the quantity of paste delivered and adapted to evenly apply to the fabric all of the regulated quantity of paste delivered thereby.

In the accompanying drawings—

Figure 1 is a side view of the machine;

Fig. 2 a fragmentary central longitudinal sectional view thereof on the line II—II of Fig. 8;

Figs. 3 and 4 detail views showing the pressure roller adjusting means;

Figs. 5 and 6 detail views showing the means for normally forcing the paste regulating roller away from the delivery or distributing roller and for limiting the extent of movement of the regulating roller toward the distributing roller;

Fig. 7 a fragmentary horizontal sectional view showing the regulating roller adjusting means;

Fig. 8 an end view of the machine;

Fig. 9 a detail sectional view on an enlarged scale showing the hard regulating roller pressed into the relatively soft yielding surface of the distributing roller; and

Figs. 10 and 11 detail sectional and end views showing a modified construction in which two regulating rollers are employed.

Referring to the drawings by numerals, 1 designates a frame upon which the several parts of the machine are mounted, and 2 designates the drive shaft of the machine upon one end of which is mounted a loose pulley 3 and a fixed pulley 4. The shaft 2 is adapted to be driven by a belt 5 from a suitable line shaft or other source of power, a belt shipper 6 being provided for shifting the belt from one pulley to the other to start and stop the machine. A friction disk

7 is fixed on the other end of shaft 2 and drives a friction pulley 8 which is slidably keyed to a vertical shaft 9 and is adjustable toward and from the center of disk 7 to vary the speed of rotation of shaft 9 by means of a suitable shifting fork 10 and a screw 11. A bevel gear 12 fixed on the upper end of shaft 9 meshes with a bevel gear 13 fixed on one end of a shaft 14 which extends transversely of the machine.

A finishing paste receptacle 15 is supported in the frame below shaft 14 and a large paste feeding and delivering or distributing roller 16 fixed on the shaft 14 extends partly into the receptacle. The roller 16 is provided with a relatively thick covering of soft yieldable material, preferably soft live rubber and is adapted to be engaged at a point above the level of paste in the receptacle by a smaller regulating roller 17 having a covering of relatively hard material, preferably hard rubber. The roller 17 is fixed on a shaft 18 rotated in a direction opposite to the direction of rotation of shaft 14 and roller 16 through a large pinion 19 fixed on shaft 14 and a small pinion 20 fixed on shaft 18. The shaft 18 is journaled in blocks 21 held to the lower ends of a pair of arms 22 which are pivotally supported at their upper ends on a shaft 23 journaled in the frame. The inner ends of adjustable stop screws 24 threaded through blocks 21 are adapted to engage a part of the frame to limit the extent of movement of roller 17 toward roller 16, and springs 25 coiled about said screws normally tend to move roller 17 away from roller 16.

To regulate the quantity of paste delivered to the silk fabric by the distributing roller 16 the regulating roller 17 is adjusted toward roller 16 to press the periphery of the hard regulating roller into the soft surface of the distributing roller to a greater or less extent according to the character of finish desired. For adjusting the regulating roller and holding the same in its adjusted position two shafts 26 are journaled at opposite sides of the machine having their inner ends threaded in blocks or nuts 27 pivotally held in recesses in the blocks 21 by studs 28. The shafts or screws 26 have pinions 29 fixed thereon adapted to be rotated through a series of gears 30 the central one of which is fixed on a stub shaft 31 adapted to be rotated in either direction by a hand wheel 32.

A pressure roller 33 having a covering

of hard rubber is fixed on a shaft 34 journaled in a pair of arms 35 supported on the shaft 23 at one end to swing about said shaft. The free ends of arms 35 are connected by a shaft 36, and a pair of guide rolls 37 and 38 are loosely mounted on the shafts 23 and 36 at opposite sides of the pressure roller. The shaft 34 and pressure roll 33 are rotated in a direction opposite to the direction of rotation of roller 16 by a pinion 39 meshing with the gear 19. The free ends of arms 35 are adapted to be raised and lowered and held in either of three positions, as shown in Figs. 2, 3 and 4, by means of cams 40 fixed on opposite ends of shaft 36, one of which cams is formed with an operating handle 41 for rocking the shaft and cams.

The finishing paste in the receptacle 15 is heated to maintain the same in a fluid state by means of a steam drum 42 to which steam is supplied through a pipe 43. The roll of silk to be finished is supported on a core or spindle 44 journaled in suitable bearings 45 on the frame and the fabric is passed over guide rollers 46, 47 and 37, thence under pressure roller 33 and over roller 38, thence under guide roller 48 and over guide roller 49, thence about a suitable tension device 50, and the edge thereof secured to a core or spindle 51. The spindle 51 is connected with a suitable chuck driven by a pulley 52. The pulley 52 is driven by a belt 53 passing over said pulley and a pulley 54 fixed on shaft 14.

A pointer 55 is carried by one of the blocks 21 and coöperates with a scale 56 fixed on the frame 1 to indicate the extent to which roller 17 is pressed into roller 16. The pointer is slidably guided in a slot 57 in block 21 and is adapted to be locked in its adjusted position by a thumb nut 58. By shifting roller 17 until it just touches roller 16 and then adjusting the pointer to zero on the scale and locking the pointer in its adjusted position, it will be obvious that the pointer will indicate the extent to which the roller 17 is subsequently forced into the soft roller 16.

In the modified construction shown in Figs. 9 and 10 two regulating rollers 59 and 60 are employed, said rollers being rotated by pinions 61 and 62 meshing with the pinion 19 on the shaft carrying the soft distributing roller 16. The rollers 59 and 60 are held to shafts 63 and 64 journaled in pairs of swinging arms 65 pivotally held to the frame by pivots 66. The pairs of arms 65 are normally rocked away from the roller 16 by springs 67 and are adapted to be forced toward said roller by eccentrics 68 fixed on rock shafts 69. Each rock shaft 69 has a handle 70 fixed thereon for rotating the shaft. One of each of the pairs of arms 65 is provided with a scale pointer 71

adjustably held thereto by a suitable thumb nut extending through a slot in the arm. Each pointer 71 coöperates with a scale 72 on the frame of the machine. The roller 59 has a covering of hard rubber and the roller 60 has a covering of soft rubber.

The operation is as follows:

The spindle 44 carrying the roll of silk to be finished is mounted in the bearings 45 and the fabric is passed over rolls 46, 47 and 23 and between the large roller 16 and pressure roller 33, the pressure roller being held out of contact with roller 16 by cam 40 as shown in Fig. 4. Cam 40 is then swung to the position shown in Fig. 3 and the machine started, whereupon rolls 16 and 23 will feed the fabric in the direction indicated by the arrows on the drawing and the operator passes the advancing fabric about the remaining guide rolls and tension device, as shown, and connects the end thereof to the spool or core 51. The cam 40 is then swung to the position shown in Figs. 1 and 2 in which position the downward pull of the fabric as it passes over roller 38 during the continued operation of the machine serves to cause the hard pressure roller 33 to press into the soft roller 16. The hard controlling roller 17 is adjusted toward the soft roller 16 until it presses into the soft roller to the desired extent, according to the character of finish to be given the fabric.

By adjusting the rollers 16 and 17 to cause roller 17 to press into roller 16 an even distribution of the finishing paste upon the roller 16 is obtained, notwithstanding the inevitable slight variations of parts of the perimeters of the rolls from true cylindrical form, or inexact alinement of the shafts of the rolls, as the surfaces of the rollers will always engage each other throughout their length since the soft resilient surface of the large roller along the line of deformation thereof by the small hard roller will expand or yield as required to compensate for such inequalities or inaccuracies.

A further important result obtained by the use of a soft applying roller and a hard controlling roller, is that the quantity of paste carried to the silk by the applying roller can be regulated with the necessary nicety. The soft roller will always yield sufficiently to prevent the hard roller from squeezing all of the paste picked up by the soft roller back into the tank. The employment of a hard controlling roller affords an accurate regulation of the quantity of paste, as the squeezing action of the rollers can be more accurately controlled than if two soft rollers were employed, and a greater pressure or more powerful squeezing action can be obtained within the necessarily narrow limits of adjustment of the controller roller. The surface of the soft rubber covering of the

applying roller has minute cells or cavities therein which receive the glue, so that the soft rubber roller will take up more glue than the hard rubber, while at the same time it will be non-absorbent. By providing a soft, porous, non-absorbent, inherently resilient applying roller, the amount of glue delivered to the silk may be nicely varied within narrow limits by the squeezing action of the hard controlling roller.

By providing a hard pressure roller pressing the fabric against a soft applying roller, the fabric is pressed into the yielding surface of the applying roller and all of the paste on the applying roller is forced into the fabric. It will also be obvious that this construction insures an even application of the paste to the silk notwithstanding inequalities in the surfaces of the pressure and applying rollers, or inexact alinement of said rollers.

By adding a soft controller roller, as shown in Figs. 10 and 11, the capacity of the machine for applying different varieties of finish to the fabric is increased. When it is desired to apply relatively large quantities of paste the hard roller 59 is shifted out of contact with the applying roller 16 and the soft roller is pressed against the applying roller causing deformation of both rollers at the squeezing point. Owing to the fact that the surfaces of both rollers are yieldable a relatively large quantity of paste may pass between the rollers.

In order that the regulating roller 17 may be readily cleaned when desired, a cleaning brush 73 is provided adapted to be shifted into and out of engagement with the roller. The brush 73 comprises a bar, preferably somewhat shorter than the roller 17, and having a strip of sponge or other suitable material secured to one side thereof. The brush is held at its ends to a pair of arms 74 by means of screws 75 which pass through elongated slots 76 in the arms. The arms 74 are pivotally held at 77 to the roller supporting means and are adapted to be swung upwardly against stops 78 formed on the arms 22 to support the brush in its inoperative position. The brush is provided with a handle 79 for shifting the same into and out of engagement with the roller 17 and for reciprocating the brush longitudinally when it is in engagement with the roller, the pin and slot connections between the brush and arms 74 permitting endwise reciprocation of the brush.

What I claim is:

1. In a silk finishing machine, the combination of a paste container, a paste-applying roller formed of soft inherently resilient non-absorbent material having minute cells or cavities in its surface to take up and hold the paste, a pressure roller engaging the applying roller, a regulating roller engaging

the applying roller at a point between the paste container and the pressure roller, means for rotating said rollers, and means for adjusting the regulating roller to cause the same to deform the resilient cellular surface of the applying roller.

2. In a silk finishing machine, the combination of a paste applying roller having a yieldable surface, a pressure roller having a rigid surface, means for feeding a web of fabric between the applying and pressure rolls, means controlled by the fabric for pressing the pressure roller against the yieldable applying roller, a regulating roller having a rigid surface, means for adjusting the regulating roller to cause the same to engage and deform the yieldable surface of the applying roller.

3. In a silk finishing machine, the combination of a paste applying roller having an outer surface of soft rubber, a rigid regulating roller, means for rotating the rollers in opposite directions, and means for adjusting the regulating roller to cause the same to deform the soft rubber surface of the applying roller different extents to vary the amount of paste fed between the rollers.

4. In a silk finishing machine, the combination of a paste container, a paste supplying roller having a thick outer covering of soft live rubber, a pressure roller engaging the supplying roller, a regulating roller having a rigid surface, means for rotating said rollers, means for adjusting the regulating roller toward the supplying roller to cause the same to engage and press into the soft rubber outer covering of the supplying roller to varying extents to vary the amount of paste passing between said rollers, and means for indicating the distance the rigid regulating roller is pressed into the yieldable surface of the supplying roller.

5. In a silk finishing machine, the combination of a paste applying roller having a yieldable surface, a pressure roller having a rigid surface, means for feeding a web of fabric between the applying and pressure rolls, means controlled by the fabric for pressing the pressure roller against the yieldable applying roller, a regulating roller having a rigid surface, means for adjusting the regulating roller to cause the same to engage and deform the yieldable surface of the applying roller, a scale held to a fixed part of the machine, and a pointer cooperating with said scale and shiftable with the regulating roller when said roller is adjusted to indicate the extent of deformation of the yieldable surface of the applying roller by the pressure of the regulating roller thereagainst.

This specification signed this twenty-third day of June, A. D. 1919.

GIUSEPPI P. VUONO.