Sept. 22, 1959 G. F. C. BURKE 2,905,142

MECHANISMS FOR APPLYING ROD CEMENT

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Fig. 1

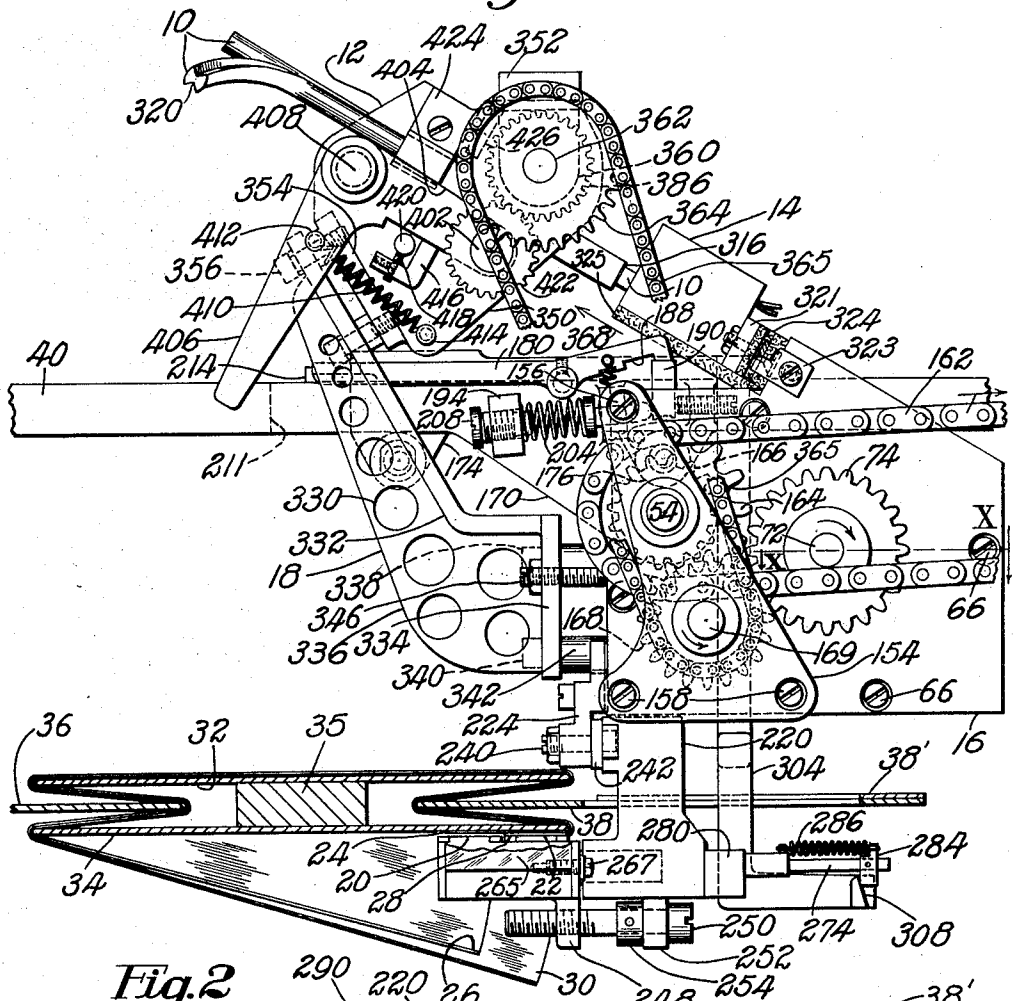
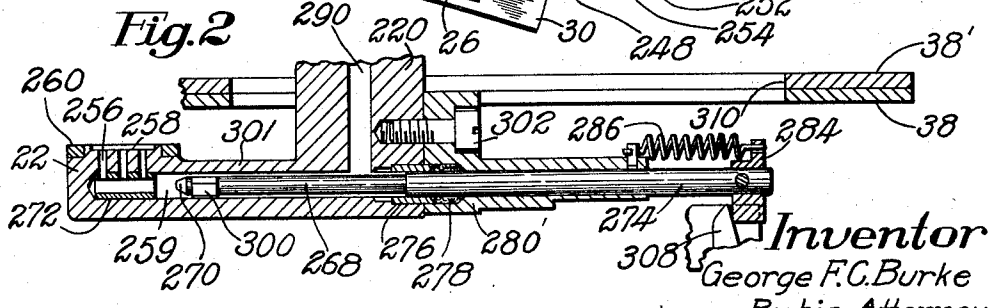


Fig. 2



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Fig. 3

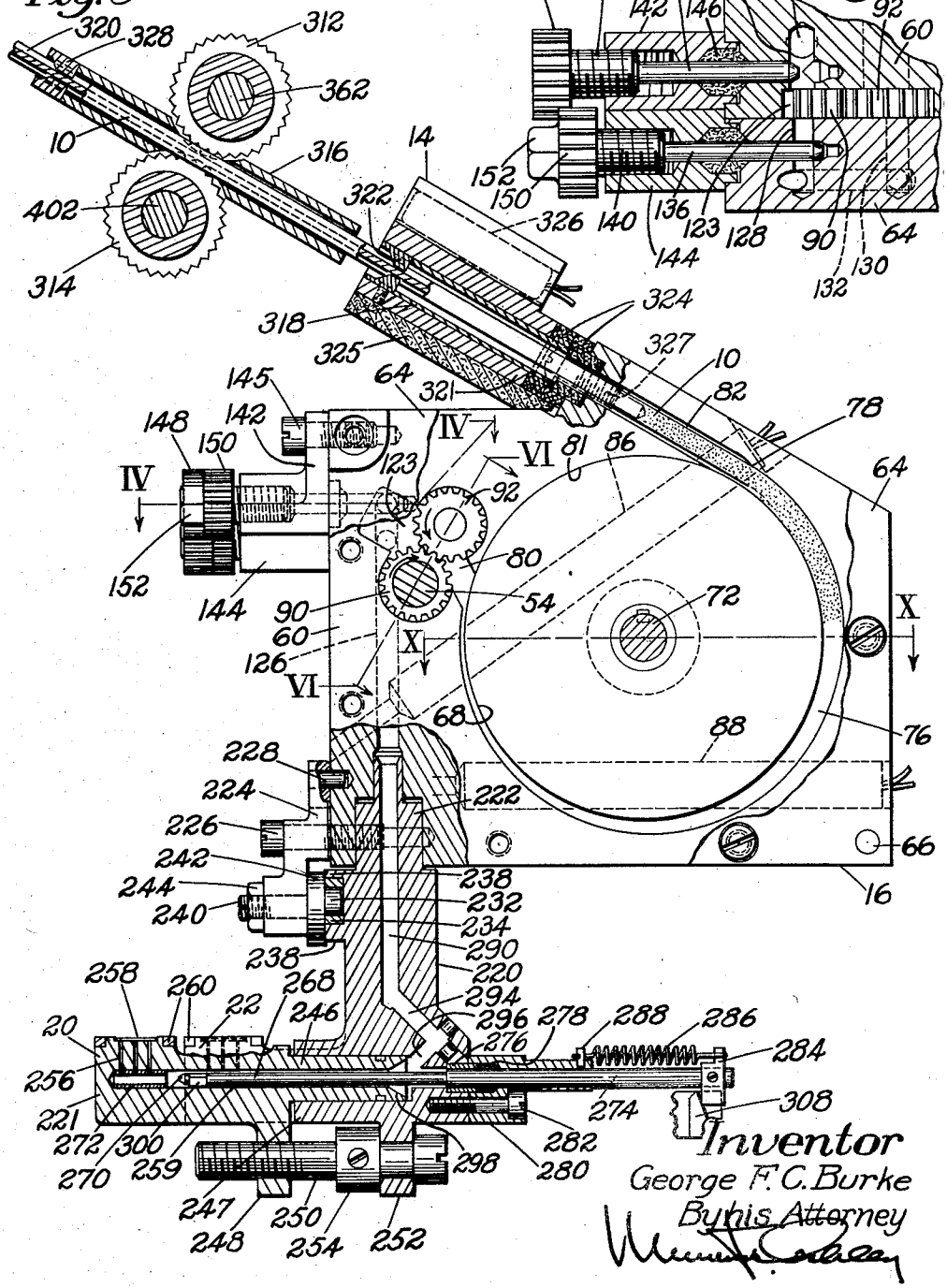


Fig. 4

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Fig. 5

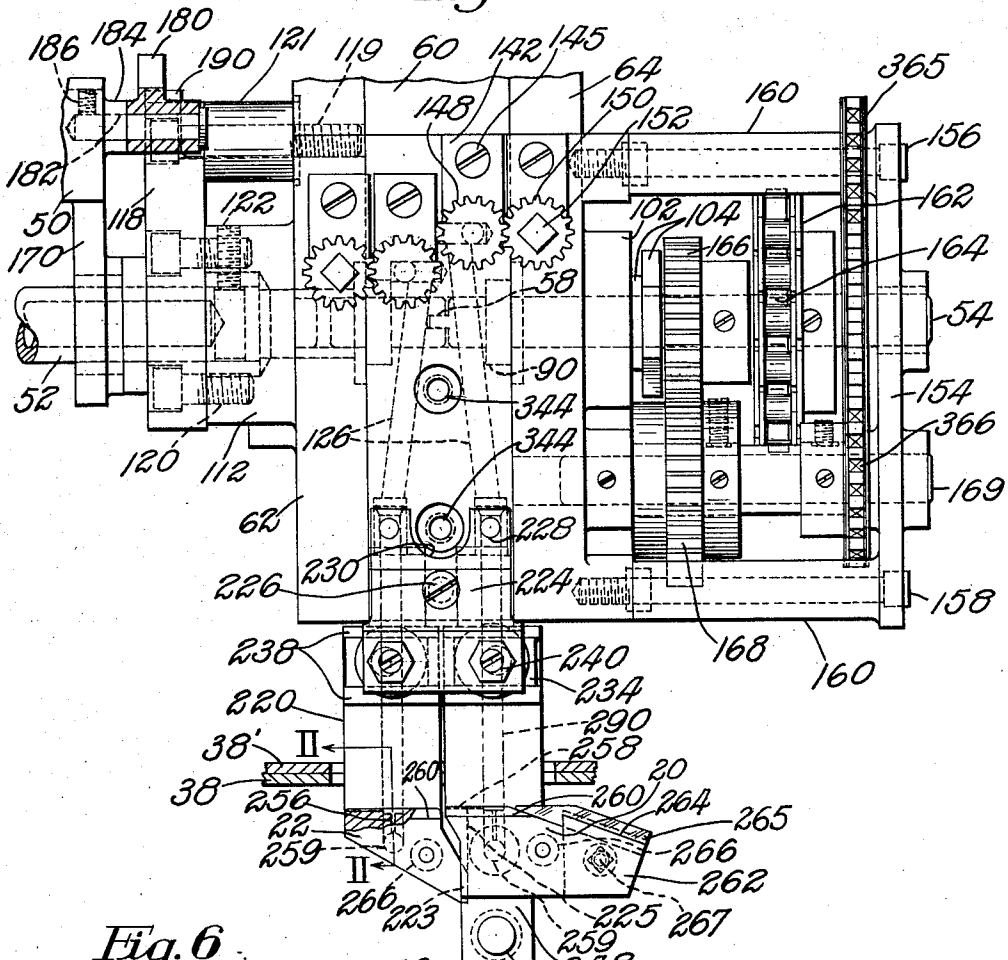
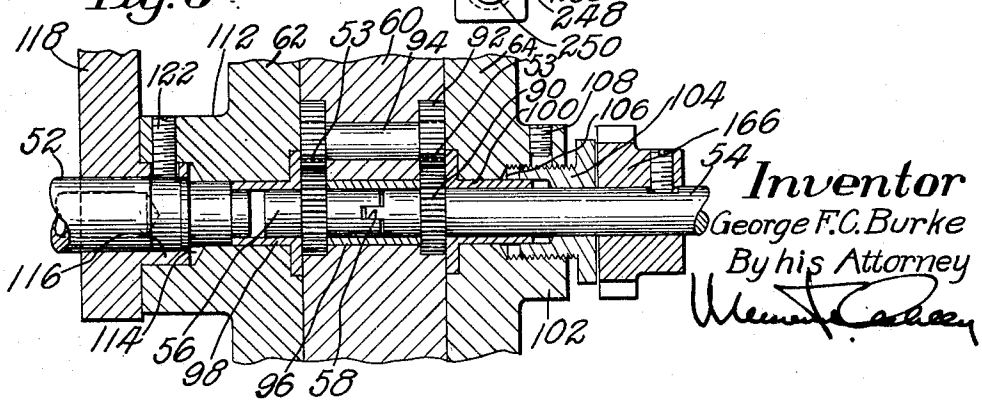


Fig. 6



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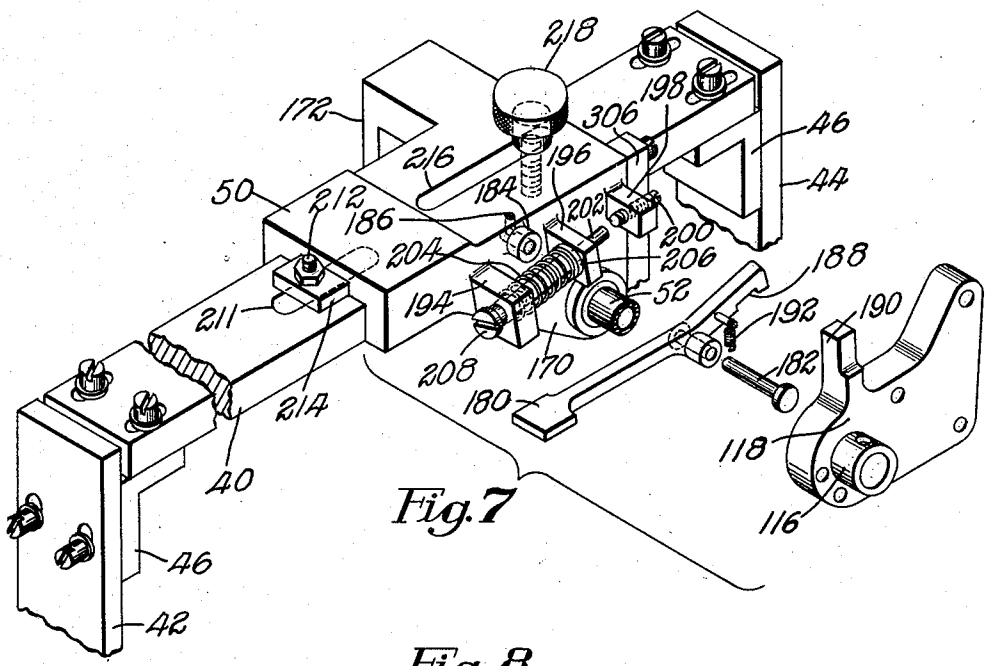
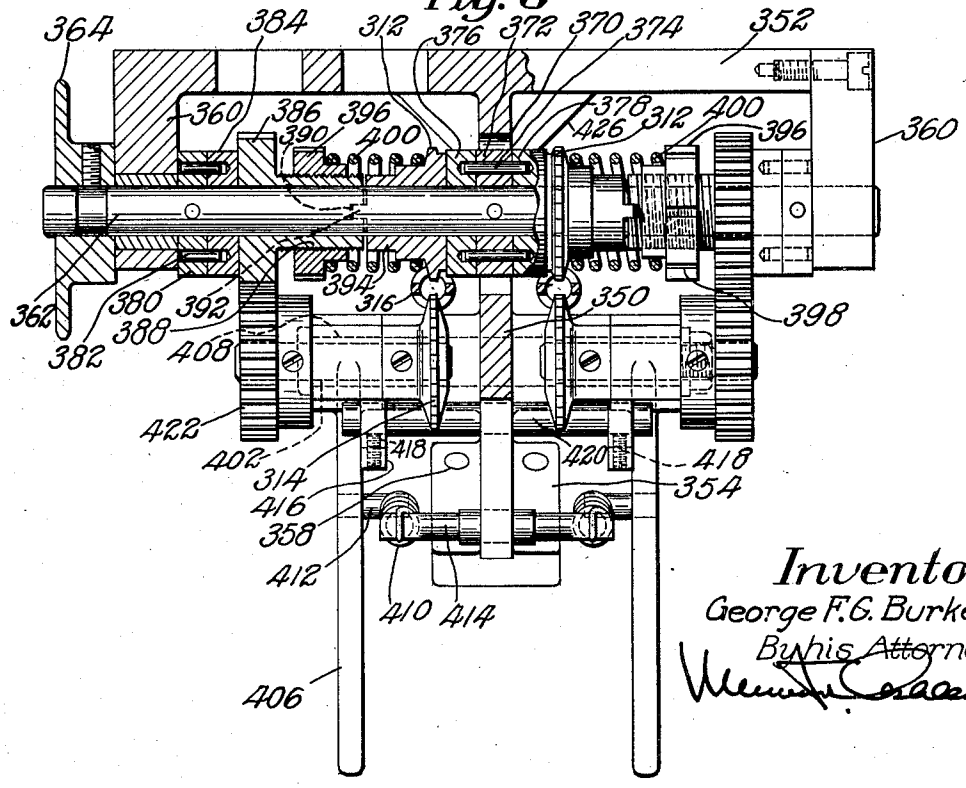


Fig. 7

Fig. 8



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Fig. 9

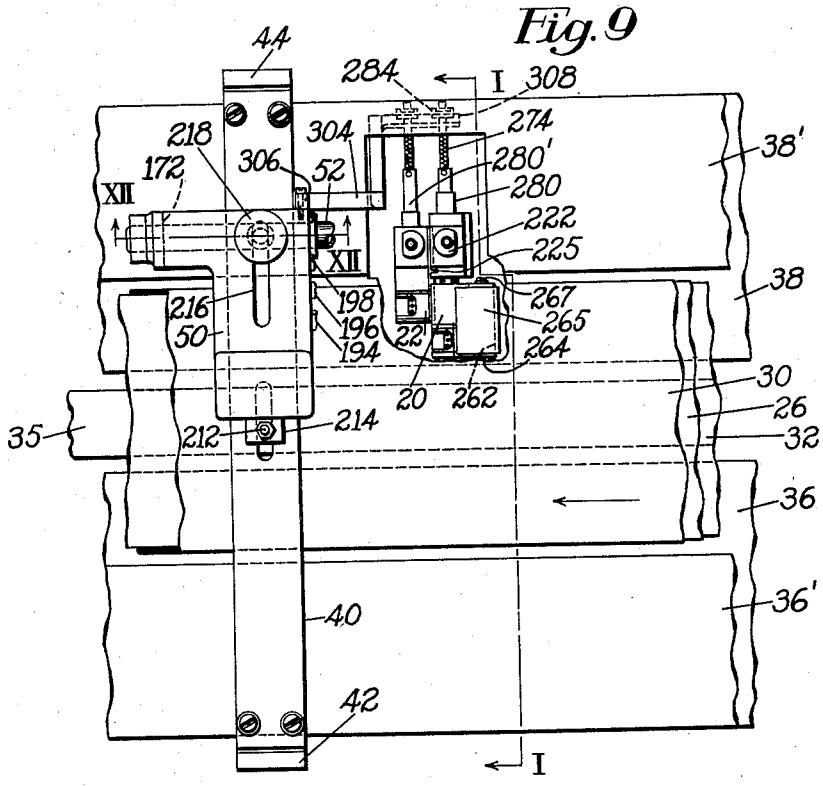
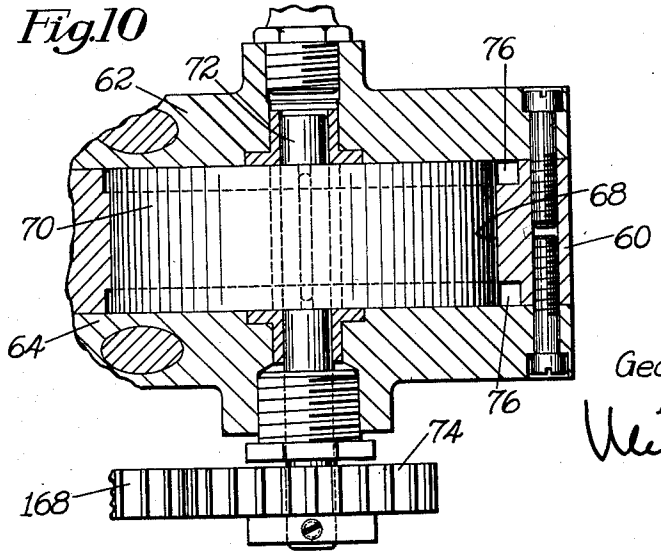


Fig. 10



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Fig.11

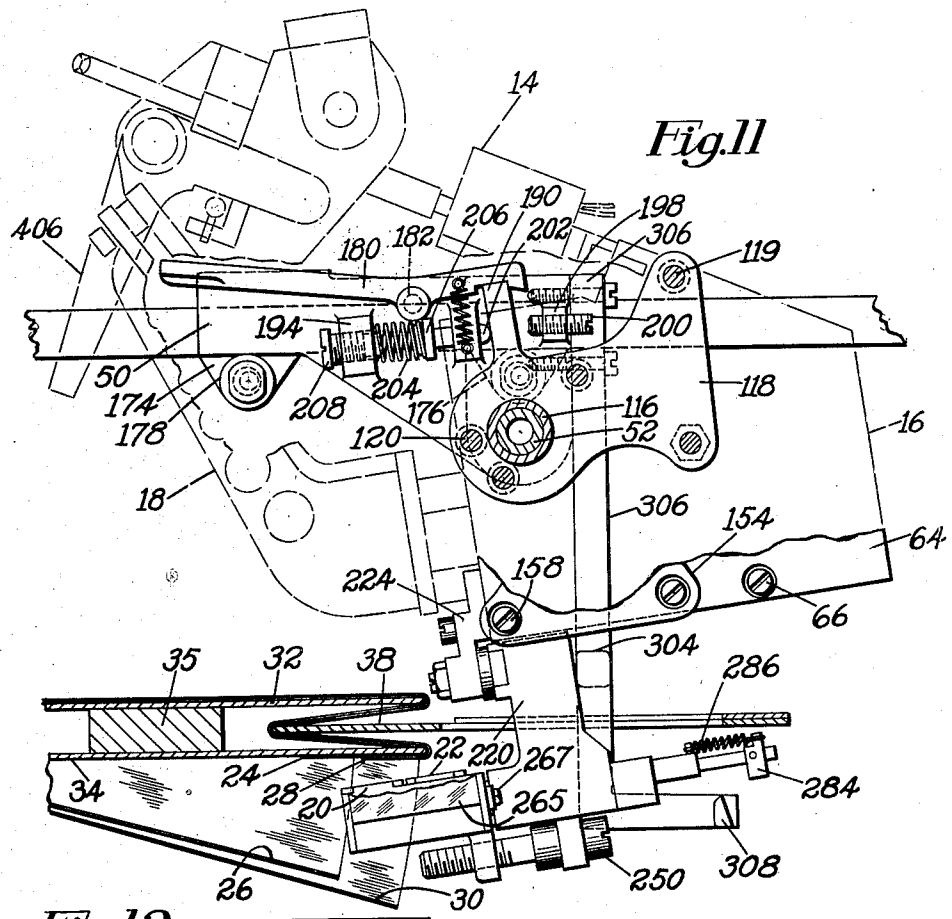
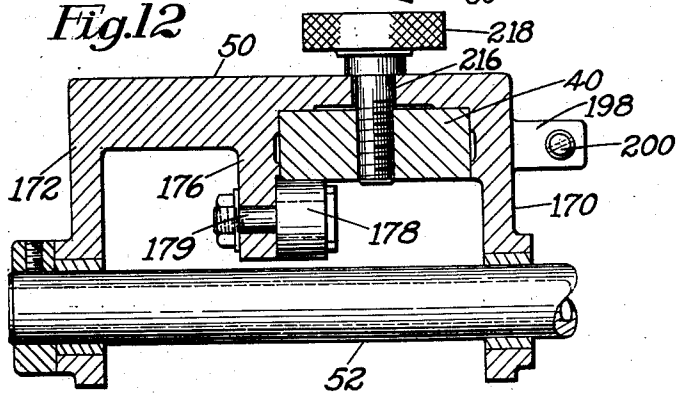


Fig.12



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2,905,142

MECHANISMS FOR APPLYING ROD CEMENT

George F. C. Burke, Beverly, Mass., assignor to United Shoe Machinery Corporation, Flemington, N.J., a corporation of New Jersey

Application December 29, 1954, Serial No. 478,428

9 Claims. (Cl. 118—411)

This invention relates to cement handling mechanisms which are particularly adapted for use with thermoplastic cements. The illustrated mechanism is arranged for use in closing the side seam of a tubular structure intended to be used in making paper bags.

In the making of paper bags, it is common to bend a web of material into a tubular structure and to close the progressively formed tube by means of a stripe of cement applied to one or both of the overlapping marginal edges of the web. Pieces of this tube are cut off and the bottoms closed to make an open topped bag. Such bags are of various sizes and are made of various materials and when, for example, they are to be employed for marketing heavy groceries, such as potatoes, the bags are frequently lined by positioning a second web inside the first web and sealing this lining web at substantially the same time as the outside web is sealed. The quick setting properties of thermoplastic cements make them particularly desirable for such an operation but require the use of heated containers which have frequently been troublesome because they are not readily kept clean.

This trouble has been overcome in other machines by forming the thermoplastic cement as an elongated flexible rod, and by providing a novel melting apparatus in which the rod is progressively softened and melted by means of a rotatable disk turning in a recessed heated casing and carrying the rod through a peripheral passage of gradually reduced dimensions to a pump which forcibly extrudes the cement through a suitable nozzle. Such a device is claimed in United States Letters Patent No. 2,765,768 granted October 9, 1956, on an application filed in the name of Hans C. Paulsen, in which the device is embodied in a machine for folding and cementing shoe parts.

An object of the present invention is to provide an improved cement-handling mechanism utilizing the principle of the Paulsen invention and arranged for use in a machine for making paper bags.

Such bag-making machines are designed for adjustment to enable differently sized bags of different types to be made and by novel mechanism is herein illustrated as embodied in a machine for making lined bags of heavy material and is adapted for use in making a plurality of sizes of bags.

Such lined bags require two stripes of cement, one on the lining and one on the outer web and hence demand a larger quantity of cement than may readily be melted and delivered by a single melting mechanism of the type shown in the Paulsen application. A feature of the invention resides in the utilization of a heated casing which is apertured to receive a single driven melting disk which is several times as wide as a rod is thick and is used for melting a plurality of rods simultaneously. The periphery of the aperture in the casing contacts closely with the mid portion of the periphery of the disk and has tapered grooves opposite to the marginal portions of the disk in which the cement from the respective duplicate rod-feeding mechanism is melted and delivered to

separate gear pumps arranged to carry the melted cement to different nozzles.

In view of the need for accommodating bags of different sizes and styles, the apparatus is provided, in accordance with another feature of the invention, with L-shaped nozzles which may be adjusted heightwise and laterally. These nozzles have delivery openings near the ends of horizontal portions and such horizontal portions may be adjusted laterally to change the positions of the stripes of cement upon the webs. The heightwise adjustment assures proper contact with an adjacent web.

Control of the quantity of cement applied to the work is effected by novel by-pass mechanisms associated one with each of the gear pumps. Each mechanism, as illustrated, has interconnected valves controlling the delivery from the pump and the size of a by-pass passage around the pump. These valves are so interconnected that the opening of one results in the closing of the other with the consequence that the pressure at the nozzle can be controlled by varying the proportion between the quantity which returns through the by-pass and the quantity which is forced through the delivery passage to a nozzle.

In the use of such bag-making machines it is frequently necessary to stop the progress of the webs, when they do not track properly, or when blemishes appear in the paper, or when the web becomes torn. At such times the supply of adhesive is preferably cut off at the delivery outlet with my novel apparatus. In accordance with another feature of the invention this is done automatically upon a movement of the whole apparatus to take the nozzles away from the work.

Inasmuch as it may be desired to treat webs which are differently positioned in the machine or to apply the stripes of adhesive upon the webs nearer to or farther from the edges thereof, the cement handling mechanism as a whole is herein illustrated as mounted upon a support which is slidable transversely of the path of movement of the web. For this purpose a bar, extending widthwise of the machine and illustrated as supported by the side frames thereof, is provided with a slide which carries the cement-handling mechanism. Inasmuch as the thermoplastic cements which are found desirable set up or harden in a fraction of a minute, stopping the bag machine for even a short time will allow the cement to expand and form humps on the nozzle outlets which are likely to cause the webs to be stuck to the nozzles so that the webs have to be torn away if they are not quickly separated from the nozzles. Furthermore, when a stoppage of the webs is required and an operator has to rethread the machine, it is desirable to provide as much space as possible between the nozzles and the webs in order to avoid burning his hands upon the hot nozzles. In accordance with another feature of the invention the whole melting and extruding mechanism is mounted upon a pivot rod extending longitudinally of the webs, thus allowing bodily displacement of the nozzles therefrom, and is held, to keep the nozzles away from the webs, by means of a latch. The arrangement is such that, upon release of the latch, the nozzles may be turned back to a working position where they contact with the webs.

If, in this displaced or tilted position of the mechanism, the cement continues to ooze from the outlets of the nozzles, a gob of cement may form and partially harden. If this happens and the noozles are returned to working position, the gob of cement will probably be carried along by the web and, when passed through the web feeding rolls, is apt to be squeezed outside of the work onto these rolls. If this happens it is necessary to stop the machine and clean the rolls so that it will not stick to

and tear the oncoming web. To avoid these possibilities, and in accordance with another feature of the invention, the nozzles are equipped with valves which are automatically closed during the tilting movement of the apparatus and are opened when the nozzles are swung back into operating position.

The direction of rotation of the melting disk in the casing is such that, when power is applied to rotate this disk, a frictional torque is imparted to the casing, though the cement, which tends to swing the nozzles into contact with the work. If, on the other hand, there is a cessation in the delivery of power to the machine and hence to the cement applying apparatus, then the torque which tends to tilt the apparatus is eliminated. Furthermore, the closing of the valves in the nozzles is accomplished by springs which extend between members, on the valve rods, resting against a fixed part of the support for the cement handling mechanism and the body of the nozzle. With this in mind it will be understood that the casing will be automatically swung aside by the springs as soon as the power stops, thus separating the nozzles from the work as quickly as possible. This will also hasten the closing of the valves.

These and other features of the invention will best be understood from consideration of the following description, taken in connection with the accompanying drawings, in which:

Fig. 1 is a front elevation of the cement handling mechanism with the webs of material to be coated shown as cut transversely on the line I—I of Fig. 9;

Fig. 2 is a detail view in section on the line II—II of Fig. 5 of one of the nozzles and its shut-off valve;

Fig. 3 shows, in front elevation, the strip melting apparatus, with parts broken away to show a rotating disk and a gear pump therein, the strip feeding mechanism and one of the nozzles being shown in vertical sections;

Fig. 4 is an enlarged detail section taken on the line IV—IV of Fig. 3 of a by-pass control arrangement embodying interconnected axially movable valve rods;

Fig. 5 is a side elevation, taken from the left of Fig. 3, showing the cement handling mechanism and a driving mechanism attached to the front face thereof shown in Figs. 1 and 3;

Fig. 6 is a transverse section through the gear pump of Fig. 3 taken on the line VI—VI therein, and showing a shaft for driving the pump which is coaxial with the axis of tilting movement of the structure as a whole;

Fig. 7 is an angular view, with the parts in exploded position, of a slidable support by which the position of the nozzles transversely of the web may be adjusted and showing a finger latch to hold the pivoted cement handling mechanism in tilted position;

Fig. 8 is a view of a feeding mechanism for cement strips taken in the direction of the arrow **368** near the center of Fig. 1, a part of said feeding mechanism being broken away and in section, the better to show a slip drive therefor;

Fig. 9 is a schematic view in plan showing a portion of a double web of material and parts of the web folding plates around which the tubular bag body is formed;

Fig. 10 is a section on a much larger scale, through the cement-melting disk and the adjacent casing taken on the line X—X of Fig. 1;

Fig. 11 is a view of the cement-handling mechanism included in Fig. 1 but with that mechanism tilted to carry the nozzles away from the work. Part of the mechanism is shown only in dash lines in order to illustrate the latch operating to hold these parts in tilted position; and

Fig. 12 is a vertical section on the line XII—XII of Fig. 9 showing one of the guide rolls which help to hold the supporting slide against tilting on the bar along which it is movable.

Considering first the general arrangement of the mechanism, as shown in Fig. 1, it will be seen that rods **10** of cement are passed through a feeding mechanism **12** and are guided from this mechanism to an intake **14** leading to a heated casing **16** in which there is a cement-handling and melting mechanism. The feeding mechanism **12** is supported upon the casing **16** by a bracket **18**. The melting mechanism in the casing delivers the cement to nozzles **20** and **22** which are positioned to apply stripes of cement to the margin **24** of a lining web **26** and the margin **28** of an outside web **30**, respectively. These webs, the ends of which are shown in Fig. 1, are supported upon an upper forming-plate **32** and a lower forming-plate **34** spaced therefrom. Both plates are attached to a supporting bar **35** on a paper-bag-making machine. Supplementing these forming-plates are gusset plates **36** and **38** which are carried by the sides of the frame (not shown) of the bag-making machine.

The casing **16** is carried by a transverse bar **40** which is attached to the frame of the bag-making machine by means of upright posts **42**, **44** (Fig. 7) joined to the bar by screw-attached angle irons **46**. On this bar there is carried a slide **50** which furnishes a support for a hollow pivot **52**. The melted cement is extruded through the nozzles under a steady pressure by gear pumps **53** (Fig. 6) which are operated through shafts **54**, **56** alined with one another and with the pivot **52** thus permitting the whole handling mechanism to be tiltably mounted about the axis of this pivot to carry the nozzles **20**, **22** laterally away from the webs of the bag-making machine without requiring a change in any adjustment. These pump shafts **54** and **56**, made separate for assembling, are interconnected by a tongue and groove joint **58**.

The casing **16** and its handling and melting mechanism is made up of a center plate **60** (Figs. 3, 5 and 6) and side plate **62** and **64** attached thereto as by means of screws **66** (Fig. 1). The center plate **60** is provided with a round aperture **68** designed to receive a circular disk **70** (Fig. 10) which is provided with a central shaft **72** journaled in the side plates **62** and **64** and provided at one end with a driving gear **74** (Fig. 1). Adjacent to side faces of the center plate **60**, grooves **76** (Fig. 10) are formed in the margins of the wall of the aperture **68**. These grooves are tapered from an inlet **78** to an outlet channel **80** (Fig. 3).

Between these openings, the upper portion **81** of the wall of the aperture **68** lies close to the disk thereby to scrape off melted cement from the disk **70** and force it into the outlet channels **80**, which like the inlets **78** are formed as grooves in this sides of the plate **60**. This portion **81** will be at a higher temperature than the adjacent portion of the periphery of the disk **70**, which has just given up heat to the cement to melt it. It serves then, to conduct heat to the disk before the latter moves into contact with the incoming relatively cool cement rod.

Communicating with each of the inlets is an entrance passage **82** which is substantially tangential to the disk **70** and which receives a strip or rod **10** of thermoplastic adhesive delivered to it by the feeding mechanism **12**. Heat is delivered to the casing **16** by electrical heating units **86** and **88** (Fig. 3) pairs of which are located in each of the side plates **62** and **64**. These are designed to furnish enough heat (at about 450° F., for example) to melt the cement as it passes from an inlet opening **78** and is frictionally dragged along by the disk to the outlet channel **80** when the disk **70** is driven continuously. This frictional drag helps to hold the nozzles against the work. The grooves **76** vary in depth, forming passages tapering from the whole diameter of the cement rod at the inlet opening to a very much reduced thickness suitable for carrying the progressively melted cement which is delivered to the outlet opening **80**.

Since there are two grooves, one adjacent to each of the side plates, the mechanism is provided with two gear pumps **53** (Fig. 6). These comprise driven gears **90** secured to the shafts **54**, **56** having the joint **58** for convenience of assembly. Associated with each of the driven

gears is an idler gear 92 which is mounted upon a transverse shaft 94 journaled in the central plate 60.

Bearing bushings 96, 98 and 100 surround the shafts 54, 56 and in the side plate 64 there is an internally threaded boss 102 receiving a threaded gland 104 for compressing a packing received in the space 106. This gland is held in position by a setscrew 108. The plate 62 has a boss 112 bored to provide a packing-receiving space 114 in which the packing is compressed by a neck 116 upon a lug plate 118 (Fig. 5). The latter is fastened to the boss 112 by screws 120 and to the side plate 62 by a screw 119 passing through a spacer sleeve 121. It is apertured to receive the hollow pivot 52 which has a reduced end forming a shoulder pressing against the bushing 98. The pivot 52 is grooved at its inner end to receive a setscrew 122 which holds the apparatus on the pivot.

The gears of the pumps, as is customary, fit in pairs of recesses formed one in each side of the central plate 60 and carry cement from the outlet channel 80, in the spaces between the teeth of the respective gears, around the peripheries of said recesses and deliver it to the pump outlets 123 (Fig. 3) also cut into the sides of the plate 60 (Fig. 4). Each outlet is connected through a horizontal passage 124 (Fig. 4) to a nearly vertical delivery passage 126 (Fig. 5).

As previously noted, the quantity of cement fed to each delivery passage 126 is controlled by a special by-pass mechanism (shown, for example, in Fig. 4) where it will be seen that the side plate 64 has a by-pass leading from the pump outlet 123 back to the outlet channel 80 (Fig. 3) of the disk mechanism. This comprises a transverse horizontal passage 128, a transverse passage 130 leading to the outlet channel 80 and an interconnecting passage 132. Axially movable valve rods 134 and 136 are positioned to cross and close the transverse passage 124 leading to the delivery passage 126 and the transverse portion 128 of the by-pass respectively. The valve rods have enlarged screw threaded portions 138 and 140 engaging internally threaded recesses in brackets 142 and 144 respectively (Fig. 3).

These brackets have upright portions coacting with attaching screws 145 and at their inner faces have necks (Fig. 4) reduced to enter recesses in the central plate 60 and in the outer plate 64 respectively. Further recesses are provided on the inner faces of the brackets around the rods to provide for anti-leakage packing material 146. Secured to the threaded portions of the valve rods are pinions 148 and 150 positioned to mesh with one another and on the pinion 150 is a tool-receiving projection 152 where, for example, a wrench may be applied to turn the valve rod 136 in one direction.

As a consequence of the gear connection between the rods, the valve rod 134 will be turned in the opposite direction when the valve rod 136 moves in to shut off the transverse passage 128, for example, the other rod 134 moves out to open the transverse passage 124 leading to the delivery passage 126. By this arrangement, whenever the delivery passage is partially closed, the by-pass passage is partially opened to allow the surplus material to return to the outlet channel 80 at the inlet side of the pump.

The right end (Fig. 5) of the shaft 54 is journaled in a bearing plate 154 (having a special outline as shown in Fig. 1). The bearing plate is attached to the side plate 64 of the melting casing by means of long screws 156 and 158 which pass through spacing sleeves 160 and are threaded in bosses on the side plate 64. The shaft 54 is driven by means of power supplied from an outside source (not shown) through a chain 162 which is wrapped around a sprocket 164 secured to the shaft 54. On this shaft there is also mounted a gear 166 which meshes with a gear 168 fastened to an idler shaft 169. This gear 168 is turn meshes with and drives the gear 74 which is secured to the shaft 72 of the rotating disk 70.

In using paper-bag-making machines, considerable difficulty is encountered because of the too frequent breaking of the one or two webs which are employed. After such breakage it is necessary for the operator to rethread the web around the forming plates and between the gusset plates. The space for this rethreading process is limited and the operator must often push the web along by means of his hands. Under such circumstances, the operator must be protected from contact with the nozzles which are heated to a temperature such that his hands may be severely burned if he touches them. The novel mechanism herein described overcomes this difficulty and gives more space for manipulation of the web by arranging the casing 16 forming an important part of the cement handling mechanism so that it may be tilted counterclockwise upon the hollow pivot 52 and the attached nozzles moved to the right in a direction to get them away from the work.

This hollow pivot 52 is alined with the pump shaft 54 and on it tilts the lug plate 118 attached to the other side plate 62 of the melting device. The pivot extends through hangers 170 and 172 (Figs. 7 and 12) on the slide 50 which rides on the top of the bar 40. The slide is also provided with depending lugs 174 and 176 (see also Fig. 1) extending downward on the far side of the bar with respect to the melting device and each lug has a roller 178 on a bolt 179 and each roller contacts the underside of the cross bar 40. These bolts 179 are each provided with an eccentric bearing for the roller so that the rollers may be adjusted height-wise into close engagement with the underside of the bar 40, thus preventing the slide from tilting transversely of the cross bar 40 under the weight of the cement handling mechanism.

To hold the mechanism tilted and the nozzles withdrawn, there is a latch 180 pivoted upon a pin 182 which enters a boss 184 on the side of the slide and is held therein by a setscrew 186. The latch 180 has at its left end a finger piece and its right end is provided with a notch 188 adapted to be brought in engagement with a lug 190 which is integral with the lug plate 118. This latch is biased toward the lug by a spring 192 secured to the hanger 170.

Consequently, when it is desired to move the nozzles temporarily away from the work, the casing 16 is tilted on the axis of the shaft 54 i.e. about the hollow pivot 52, to carry the nozzle counterclockwise away from the work until the lug 190 is engaged by the latch 180 and the casing is held in tilted position.

On the hanger 170 of the slide there are integral lugs 194, 196 and 198. The lug 198 is provided with an adjustable stop screw 200 and the lug 190 on the tiltable lug plate 118 rests against this screw 200 when the latch has been released and the melting device and the nozzles are moved back to operative position. In the latched position, however, when the melting device is tilted the lug 190 rests against a pin 202 which is urged toward the lug by means of a spring 204 interposed between a flange 206 on the pin 202 and a screw 208 which supports the spring in position.

It will be noted that the cross bar 40 is provided with a slot 211 through which passes an attaching bolt 212 for securing in adjusted position a stop block 214 which limits the movement of the slide in a direction to carry the nozzles 20, 22 inwardly of the work. The slide itself is also provided with a slot 216 which is parallel to the length of the cross bar 40 and through which passes a clamp screw having a head 218. The screw is threaded in the cross bar 40 and its head engages the top of the slide to hold it in position against the block.

The delivery passages 126 transfer melted adhesive to the nozzles, each of which has an upright stem 220 (Fig. 3) and a horizontal arm 221. The stems are each provided with a reduced head 222 which is flattened at its

outer side (Fig. 9) to keep the nozzle from twisting out of place. The reduced heads are slidably mounted in correspondingly shaped recesses in the central plate **60** of the melting mechanism. Added rigidity to insure parallelism of the two nozzles is secured by providing nozzle **22** with a vertical rib **223** (Fig. 5) entering a vertical groove **225** (Figs. 5 and 9) in nozzle **20**.

An exact heightwise adjustment is made possible by eccentrics **232** (Fig. 3) interposed between a double bracket **224** on the central plate and the nozzle stems. This bracket **224** is secured to the front face of the plate **60** by a center screw **226** and is additionally positioned by dowel studs **228** lying one at each side of a notch **230** in the upper edge of the bracket. The lower portion of the bracket is spaced from the stems **220** of the nozzles and has, one for each nozzle, an eccentric **232** which is received in a circular hole in a slide **234** which lies in a horizontal recess between upper and lower flanges **238** formed on the stem. This eccentric **232** is integral with a stud **240** provided with a spacer **242** and threaded at its outer end to receive a locknut **244**. The threaded end also has a screwdriver slot to provide a way of securing an exact adjustment of the eccentric **232**.

To secure a horizontal adjustment of the outlet openings of the nozzle **20**, its arm **221** is provided with a neck **246** slidable in a recess traversing part of an elbow **247** at the bottom of the nozzle stem **220**. A depending flange **248** on the nozzle is threaded to a screw **250** freely rotatable in a flange **252** which is integral with the bottom of the stem **220**. This screw has a collar **254** to hold it against axial movement with respect to the flange **252** but it will be clear that rotation of the screw serves to adjust the position of the nozzle arm **221** laterally of its stem.

At the outer end of the nozzle arm **221** vertical outlet passages **256** open at their upper ends in a recess **258**. Inasmuch as the work passes from right to left in Figs. 5 and 9, the recess **258** is open at the left side of the nozzle in those figures. Surrounding three sides of the recess is a wear piece **260** of harder metal and it will be noted from Fig. 5 that the nozzle **20** is provided with a rearwardly extending portion **262** having a flange **264** against which rests the edge of a glass plate **265** held by a screw **267** which is threaded in the portion **262** and acts to draw a clamp plate against the other edge of the glass. The rapidly moving lining web **24**, as it is lifted slightly to pass over the nozzle **20** creates considerable friction which tends to wear away a metal structure. This is avoided when the web is supported on the glass plate **265**. Each of the nozzles is provided with an electric heating unit **266**.

When the applying apparatus is tilted to one side, as previously described, in order to permit the operator to reposition the work, there is a tendency for residual cement in the passages to ooze out of the outlet openings **256** and to form a small lump in the recess **258**. If such a lump is allowed to become stiff and the nozzles are again put into normal position where they contact with the work, the lump of cement transferred to the webs of paper will be squeezed laterally of the feed rolls of the paper-bag-making machine with the resulting spoilage of pieces of work and sometimes the soiling of parts of the machine so that a great deal of trouble is caused.

To correct this difficulty, the nozzles herein shown have horizontal passages **259** provided with sliding stems **268** each having a tapered end **270** (Fig. 3) which, in the inoperative position of the nozzle, seats upon the end of a tube **272** lining the nozzle passage to act as a valve therein. Each lining tube **272** is apertured to communicate with the outlet passages **256**, of which there may be one or several according to the needs of the work. It will be seen from Figs. 2 and 3 that the valve stems have enlarged sections **274**, each of which slides in a lining sleeve **276** which serves also as a gland to compress packing **278** in the recesses of laterally extending blocks **280** or **280'** (Figs. 2 and 9) which are attached to the right-hand sides of the nozzles by screws **282** and **302** respectively. At its outer end, each valve rod **274** is provided with a collar **284** and a spring **286** is interposed between this collar and a pin **288** upon the block **280** or **280'**. This spring acts to draw the valve to closed position when the applying mechanism is tilted to carry the nozzles to inoperative position.

The upright stem **220** of the nozzle **20** has a passage **290** communicating with the passage **259** in the horizontal arm **221** by means of two inclined passages **294** and **296**. The passage **296** opens at a point to the right of the end of neck **246**, in its innermost position, and the neck is also recessed at **298** to facilitate a connection between the inclined passage **296** and the horizontal passage **292** at that time. Adjacent to the head **270** of the valve stem is a guide block **300** fitting the passage **292** but slabbed off at a number of sides in order to provide sufficient space to allow a free passage of the adhesive from one side to the other of this block.

As shown in Figs. 2 and 5 the arm **301** of the nozzle **22** is shaped somewhat differently from that of the nozzle **20** and is integral with its stem **220** since there is less need for adjusting it horizonally with respect to its stem because it is used to coat the margin **28** of the outside web **30** which lies close to the edge of the forming plate **34** and any needed adjustment may be secured by adjustment of the stop **214** for the slide **50**.

It will also be seen from Fig. 2 that a block **280'** which corresponds to the block **280** on the nozzle **20** does not extend as far out from the nozzle as the latter since the movement of the valve rod **274** therein is much shorter. This block **280'** is attached to the nozzle by a screw **302**.

When the casing **16** and the attached nozzles are returned to the operative vertical position shown in Fig. 1, the valves are withdrawn from the seats provided by the lining tubes **272** by means of an arm **304** (Fig. 9). This arm has an upright portion **306** attached by screws to a corner of the slide **50**, and has a crooked connection with a substantially horizontal stop portion **308** which coacts with the inner face of the collars **284** and operates to open these valves by displacing the valve rods against the tension of the springs **286**. Also, by reason of the contact of the collars **284** with the stop portions **308** the springs **286** are effective, in case of any cessation in the delivery of power to the driving chain **162**, to tilt the casing around the axis of the hollow pivot **52** and thus to move the nozzles away from the stationary webs. The chance of thus having these nozzles stick to and eventually tear the webs is thus automatically avoided.

Inasmuch as the gusset plates **36** and **38** are attached to side flanges of the machine and extend inwardly therefrom they are reinforced by means of superposed plates **36'** and **38'**. The plates **38** and **38'** are cut away to form an opening **310** (Figs. 2 and 9) through which the stems **220** of the nozzles pass and this opening is large enough to permit the tilting movement already described.

To provide a steady supply of cement to the entrance passage **82** of the melting mechanism, each half of the feeding mechanism **12** is provided with upper and lower feed rolls **312** and **314** having peripheries which are notched for better engagement with a rod **10** of a thermoplastic adhesive to push the same through a guide tube **316**, across a space and into a passage provided in an entrance tube **318** supported in the intake **14**, this being in alinement with the entrance passage **82** of the melting device. Each rod of cement **10** delivered, for example, from a reel (not shown) may advantageously be grooved on top and bottom as at **320** (Figs. 1 and 3). This grooved rod has been found advantageous for various reasons such as better gripping of the rod by the feed wheels and a further advantage that the consequently increased surface of the rod makes it easier to transfer heat to it. Each of the two entrance tubes **318** has in-

wardly projecting fins 322 which substantially fit the grooves 320 of the rod and tend to prevent any oozing of the melted material back along the entrance tube 318 when the driven disk 70 in the casing 16 has been stopped.

Each tube 318 is supported in the intake 14, which is a metal casting, but the transfer of heat by conduction from the heated casing 16 is reduced by interposing insulating plates 324 one of which is bolted to a flange 321 integral with the intake. The innermost one is received in a cross slot at the top of the casing and is in the form of a crossbar held by screws 327 (Fig. 3) as well as by clips 323 with bent ends which engage the plates 324 to hold the intake on the casing. A sheet of insulation 325 protects the intake from convection currents rising from the casing 16. At the same time the intake 14 is provided with a heating unit 326 to which electrical power may be delivered under the control of a thermostat (not shown) so that the temperature of the entrance tubes 318 is independently held as nearly constant as may be. In this connection it will be noted that the constant introduction of new material 10 to the entrance tube tends to reduce its temperature while a cessation of movement of the cement rod 10 permits an increase in the temperature of the intake and its tube 318. The action of the automatically controlled heater 326 tends to maintain a uniform temperature (for example, 200° F.) at which the rod will slide freely over a warm surface of the tube but will not become unduly heated so that melted portions tend to back out of the entrance to said tube.

The guide tube 316 is spaced from the entrance tube 318 so that there may be no transfer of heat from one to the other by conduction, it being understood that a raising of the temperature of the guide tube would tend to soften the incoming rod so that it might stick to the tube when the rod is stationary. Inwardly extending projections 328 in the guide tube 316 overcome any tendency of the rods to twist and keep the grooves of the rods alined with the feed wheels.

For similar reasons, a transfer of heat from the much hotter casing 16 to the working parts of the feeding mechanism 12 is undesirable and consequently the latter is supported upon the bracket 18 (Fig. 1) the temperature of which is kept as low as possible by providing a multiplicity of holes 330 and arranging the feed rolls so that they are not positioned directly above the heated casing 16. This bracket is made up of an inclined plate 332, an end plate 334 and spaced side flanges 336, all welded together. It is supported on the casing 16 by screws 338 and 340 which pass through spacers 342 and enter tapped holes 344 (Fig. 5) in the face of the central plate 60. In addition, the end plate 334 is provided with screws 346, one on each side of the end plate, and these screws, when brought into engagement with the upright surface of the casing 16, tilt the bracket slightly in order to aline the guide tube 316 with the entrance tube 318.

Various parts of the feeding mechanism 12 are shown in Fig. 8 supported on the bracket 18 by means of a center plate 350 which is integral with a cross bar 352. The center plate 350 has flanges 354 at its lower end which are attached to the upper end of the inclined plate 332 of the bracket by screws 356 (Fig. 1) passing through spacer blocks and engaging tapped holes 358 in the flanges.

At the ends of the cross bar 352 are hangers 360, one being removably attached, in which there is journaled a drive shaft 362 carrying at one end a sprocket 364 connected by means of a chain 365 with a sprocket 366 (Fig. 5) which is clamped to the idler shaft 169. It will be recalled that Fig. 8 is viewed in the direction of an arrow 368 in Fig. 1. The center plate 350 is apertured at 370 to give room for parts mounted on the shaft 362.

At the center of this shaft 362 is a disk 372 pinned on the shaft and provided with cross pins 374 which engage adjacent disks 376 and 378 which rest against the side faces of the adjacent cement-rod feed wheels 312 and provide a frictional drive therefor. One of the coacting faces is chrome plated steel and the other is cast iron to get continued friction, without any sticking. The shaft 362 is held against displacement between the hangers 360 by means of end disks 380 which are pinned to the saft. The end disks have pins 382 parallel to the axis of the shaft which drive disks 384 frictionally engaging the end faces of gears 386 which have inwardly extending sleeves 388 provided with diametrically opposite notches 390. These notches receive prongs 392 upon sleeve-like projections 394 of the adjacent feed wheels 312. The outer surfaces of the sleeves 388 are threaded to receive threaded nuts 396 which are provided with notches 398 so that they may be adjustably positioned by means of a spanner wrench, thus enabling adjustment of the compression of springs 400 which are interposed between the feed wheels 312 and these nuts 396.

The lower feed wheels 314 are attached to short shafts 402 carried by inwardly extending ends 404 (Fig. 1) of hand levers 406 swingably mounted upon a pin 408 received in and supported by the center plate 350. The two feed wheels are held in engagement with two like cement rods by means of springs 410 extending between studs 412 on the levers and a cross pin 414 carried by the mid plate 350. At their outer ends the short shafts 402 which support the lower feed wheels are provided with gears 422 meshing with gears 386 on the shaft which is driven by the chain connection to the sprocket 364. Another cross pin 420, mounted in the mid plate 350, coacts with abutment screws 418 in hook-like hangers 416 (Figs. 1 and 8) on the respective hand levers 406 to determine the inner position of the lower feed rolls 314 against the cement rods. The guide tubes 316 are supported upon the mid plate 350 by screw-attached lugs 424. The mid plate 350 is braced with respect to the cross bar 352 by means of an angular bracket 426 (Fig. 1) welded between the two. Thus, there is provided an impositive drive for the cement rods which keeps an adequate supply in the entrance tubes 318 but does not push more cement into the melting apparatus unless some of the cement therein has been forced out through the nozzles.

In preparing to use the machine, the two webs of paper will be threaded around the forming and the gusset plates as shown in Figs. 1 and 9. Supplies of strip or rod cement will be hung (not shown) on the machine and the ends threaded through the guide tubes 316, after displacing the lower feed rolls 314 by the hand levers 406 for this purpose. The rod ends will be carried ahead through the entrance tubes 318 of the intake 14 into the casing 16. There they will be pushed ahead until the ends contact the disk 70. The latches 180 of the casing having been released so that the mechanism may be swung around to cause the nozzles to contact the work, thereby opening the valves in the nozzles, the drive for the web feed (not shown) and the drive chain for sprocket 164 (Fig. 5) may be started. Therefore, stripes of melted cement will be applied to the margins of the lining web 26 and the outside web 30. These margins will be brought against the corresponding margins at the other edge of each web and pressed together by feed rolls (not shown) of the bag-making machine. The bonds will be completed quickly because of the quick-drying property of the cement and pieces of tubing can then be cut off for bottom closing and any other steps needed for the completion of individual bags.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent of the United States is:

1. In a cement handling mechanism, a heated casing

for progressively melting thermoplastic cement supplied to it in a pair of continuous strips, said casing comprising a center plate having a round opening, a disk approximately as thick as the center plate rotatably mounted in said opening, side plate secured to the center plate to close said opening and provided with bearings for said disk, said casing having two inlet openings through which said strips of cement may be presented to the disk, and outlet openings through which melted cement may be delivered, said center plate being cut back around a major portion of the periphery of the disk to form grooves therein positioned opposite the margins of its peripheral surface, said grooves being tapered from the inlet end, where they are adapted to receive the unmelted strip, to a much smaller dimension adjacent to the outlet opening through which the melted cement is delivered, the periphery of the round opening of the center plate lying closely adjacent to that portion of the disk which, at any moment, lies between the outlet and the inlet openings, thereby to force melted cement into the outlet openings and to conduct heat from the casing to the disk.

2. In a cement handling mechanism for a thermoplastic cement, a heated casing comprising a center plate and side plates, said center plate being provided with dual melting and feeding mechanisms, gear pumps in recesses formed in the sides of said center plate for receiving the delivered cement from the respective mechanisms, the casing having delivery passages communicating with the delivery side of each of said pumps, said side plates being attached to the opposite sides of the center plate and closing said recesses, each of the side plates having a by-pass passage leading from the receiving side to the delivery side of a respective pump, valves controlling the delivery passages and the by-pass passages respectively, said valves being threaded in the casing for movement from open to closed position, and gears connecting the valves whereby the closing of one valve is accompanied by the opening of the other valve.

3. In a cement extruding mechanism, a casing having a delivery passage, a gear pump in said casing for receiving cement and forcing it through the delivery passage to a piece of work, the delivery end of said pump being provided with laterally extending passages, valve rods movable in paths intersecting said passages and arranged to close them, said delivery passage communicating with one lateral passage, a by-pass communicating with the other lateral passage and extending to the receiving end of the pump, packing means for said rods surrounding the same, brackets screwed on the casing to comprise said packing means, the outer ends of said valve rods passing through threaded openings in the brackets, and meshing pinions interconnecting said valve rods whereby the quantity of cement passing through the discharge passage and the quantity of cement traveling through the by-pass passage are equally and oppositely adjusted by the rotation of said pinions.

4. In a cement handling mechanism, a cement melting and feeding device having a casing, a rotary disk journaled therein, said casing having an outlet, said device having a nozzle communicating with said outlet and adapted to apply a strip of cement to one surface of a web movable past the casing, means for supporting said device for tilting movement to carry the nozzle laterally away from the web, and means for automatically stopping the movement of cement through the nozzle as said device is tilted away from the work.

5. In a cement handling mechanism, a tiltably mounted delivery mechanism for furnishing cement under pressure, a nozzle connected to said delivery mechanism provided with a horizontally extending arm having an outlet passage positioned vertically in the outer end of said arm for applying a strip of cement to a web movable past the casing, a sleeve within said nozzle arm communicating with said outlet passage, a valve in the arm, said valve including a slidable valve rod cooperating with the end of the sleeve to stop the flow of cement to said passage, means for moving said valve rod into engagement with the sleeve to close the valve as the delivery mechanism is tilted away from the web, and a stop adjacent to said valve rod for moving the valve rod away from the sleeve to open the valve as the nozzle is moved back to operative position adjacent to the work.

6. In a web-handling machine, means including a casing for delivering cement under pressure, a nozzle extending laterally from said casing positioned to apply a stripe of cement to one surface of a web movable past the casing, a support attached to said machine, a pivot in said support upon which the casing is tiltable, said support having spaced stops, said casing having a lug projecting to a position between said stops whereby the extent of tilting movement is controlled, one of said stops comprising a member yieldably mounted upon said support, and a latch coacting with said lug for holding the casing in tilted position against said yielding stop with the nozzle out of engagement with the work.

7. In a machine for applying a stripe of cement to the margin of a web of material, means for moving said material along a fixed path, a bar extending transversely of said path and of said machine and attached thereto, a slidable support mounted for movement along said bar, means for clamping the support to the bar, a delivery mechanism on said slidable support for delivering cement under pressure including a nozzle extending laterally therefrom to a desired position upon the margin of the web, means for tiltably supporting the delivery mechanism upon said slidable support, spaced stops on the support one of which is yieldable, said delivery mechanism having a lug extending toward the support into a position between the stops, and a latch for holding said lug against the yieldable stop with the delivery mechanism in a tilted position whereby the nozzle is held away from the work.

8. In a web-handling mechanism, means including a tiltably supported casing for delivering cement under pressure to the web, a nozzle extending laterally from said casing and positioned to apply a stripe of cement to one surface of a web movable past the casing, and a driven rotatable member within said casing, said casing being provided with a passage around at least a portion of the periphery of the rotary member to permit the latter to drag the cement along said passage by frictional engagement therewith and thereby to exert a force on the casing tending to tilt it in a direction to hold the nozzle in contact with the work.

9. In a web handling machine, a power driven rotary member, a tiltably mounted heated casing having inlet and outlet openings and recessed to receive said rotary member, said casing having a passage extending around part of the periphery of said member in which cement is dragged by said member from the inlet to the outlet opening, a nozzle extending laterally from the casing and connected to the outlet thereof for applying a stripe of cement to a web movable past the casing, a support upon which said casing is tiltably mounted, and a spring between the nozzle and the support tending to tilt the casing to draw the nozzle away from the work when no power is supplied to rotate said driven member and in a direction opposite to the torque imparted to the casing through the cement.

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