July 27, 1965 G. E. ENGELSTAD ETAL 3,197,614

FUSER UNIT FOR ELECTRONIC PRINTING MACHINE

Filed Aug. 31, 1961 7 Sheets-Sheet 1

FIG. 1

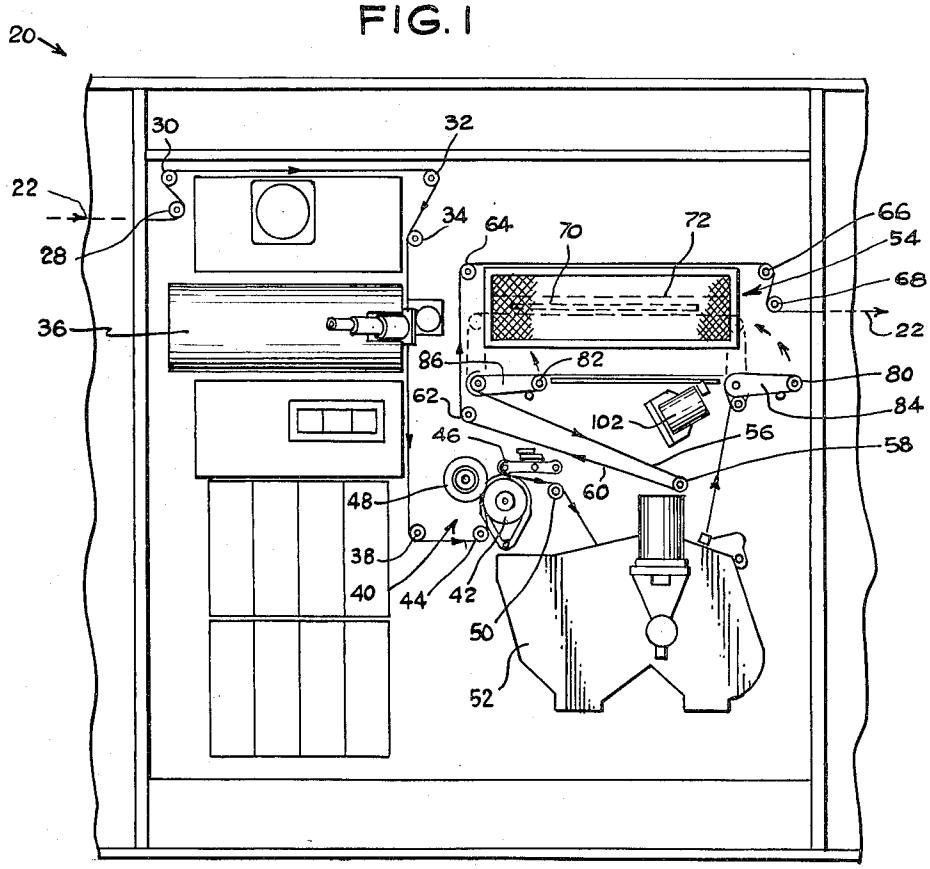
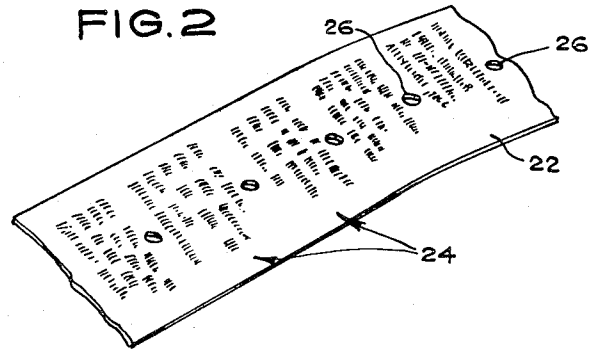


FIG. 2



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FUSER UNIT FOR ELECTRONIC PRINTING MACHINE

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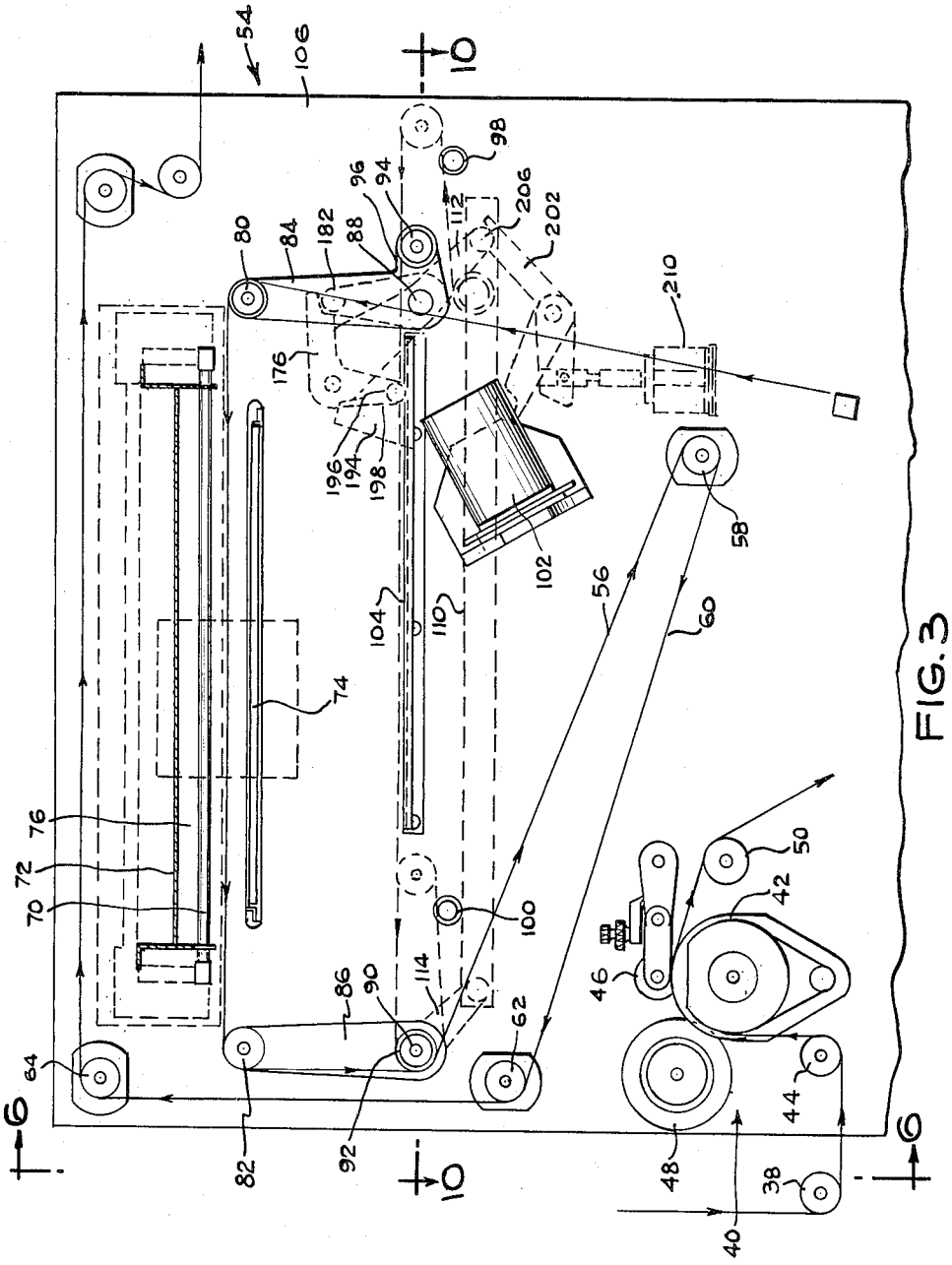

FIG. 3

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FUSER UNIT FOR ELECTRONIC PRINTING MACHINE

Filed Aug. 31, 1961 7 Sheets-Sheet 3

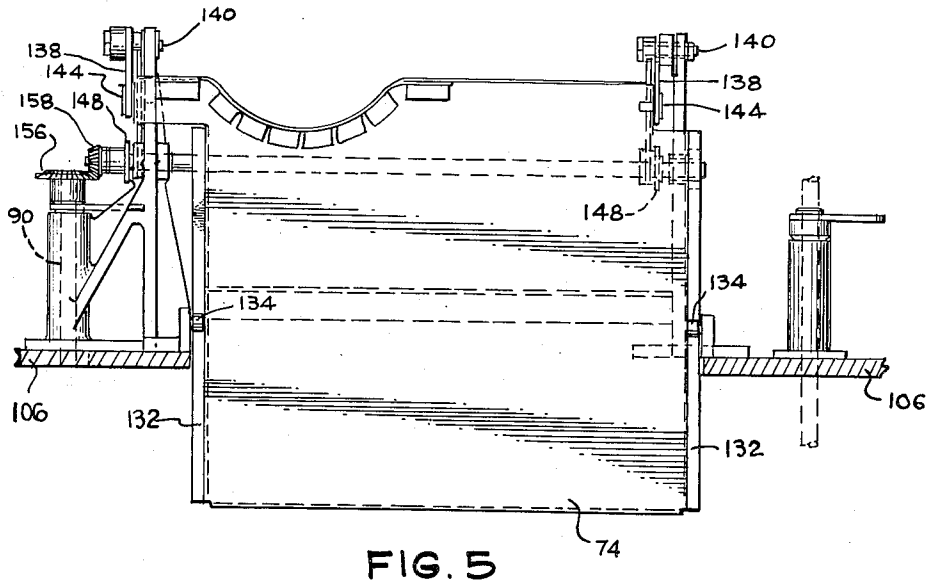

FIG. 5

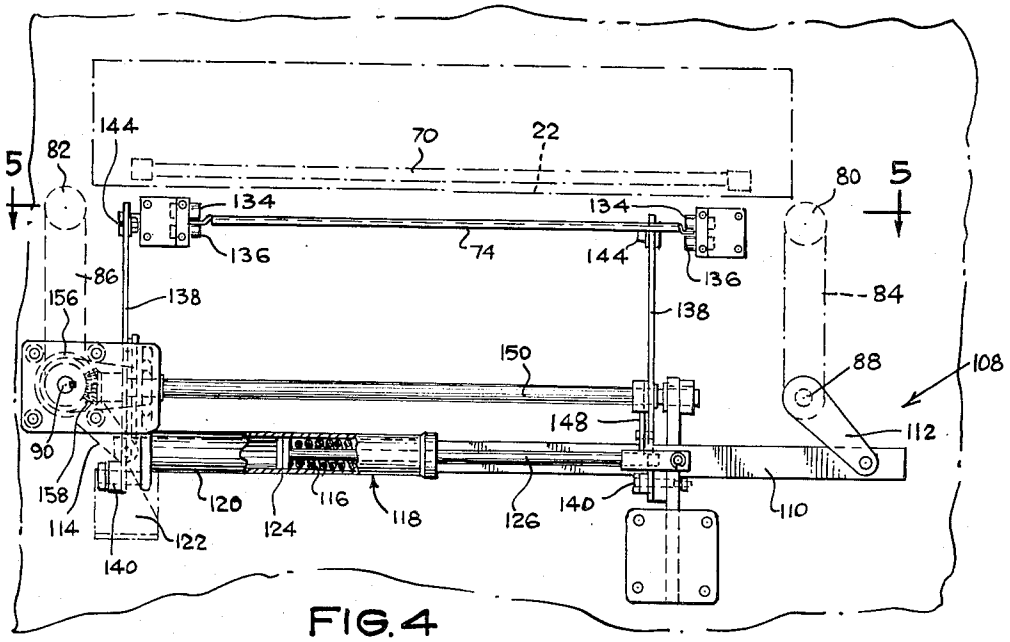

FIG. 4

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FIG. 8

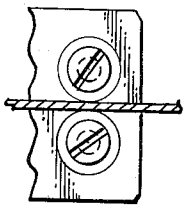

FIG. 7

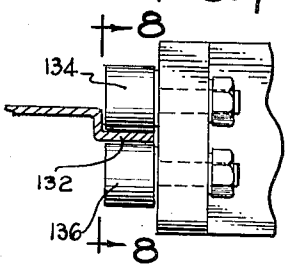

FIG. 6

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FUSER UNIT FOR ELECTRONIC PRINTING MACHINE

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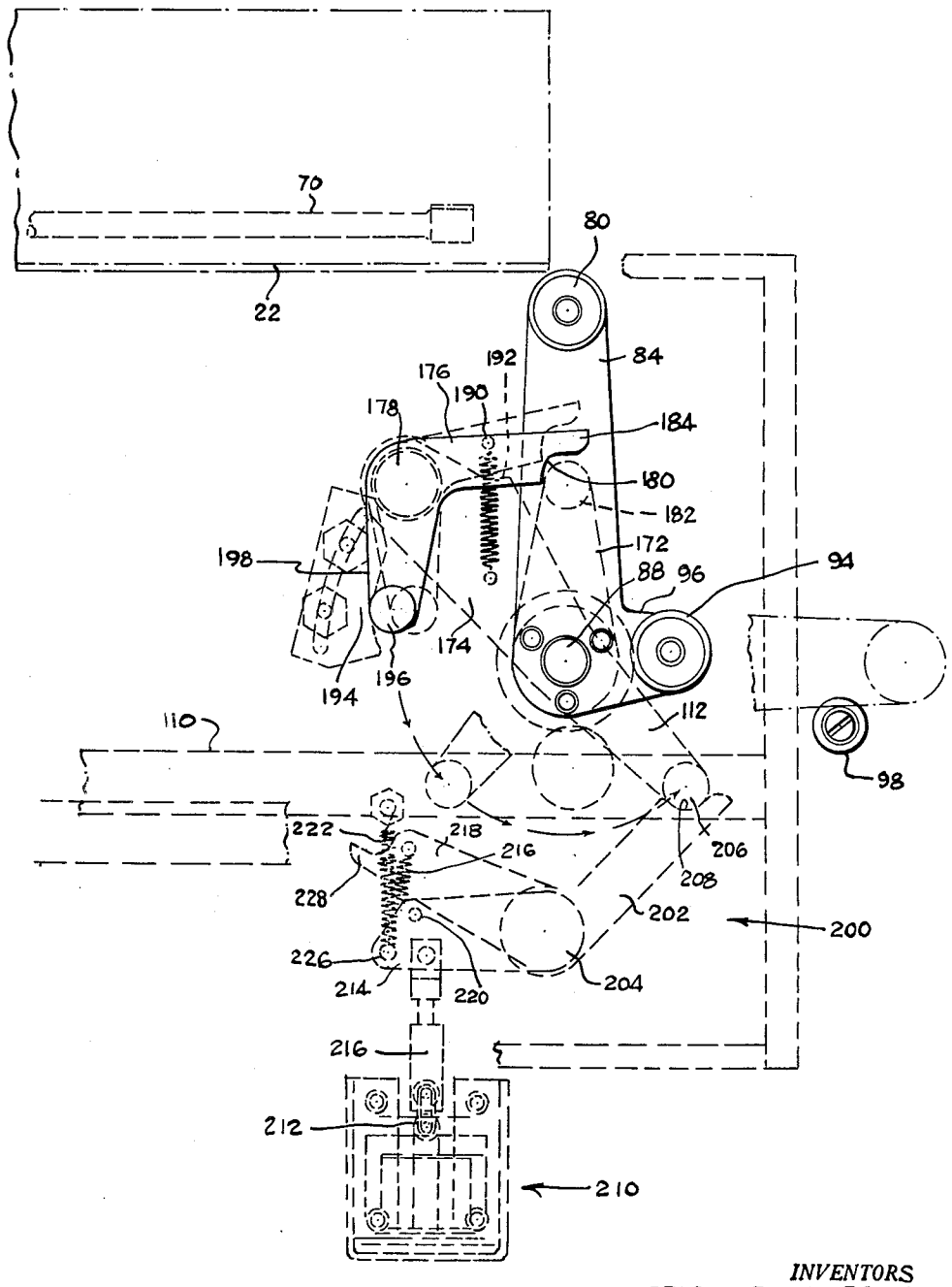

FIG. 9

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FUSER UNIT FOR ELECTRONIC PRINTING MACHINE

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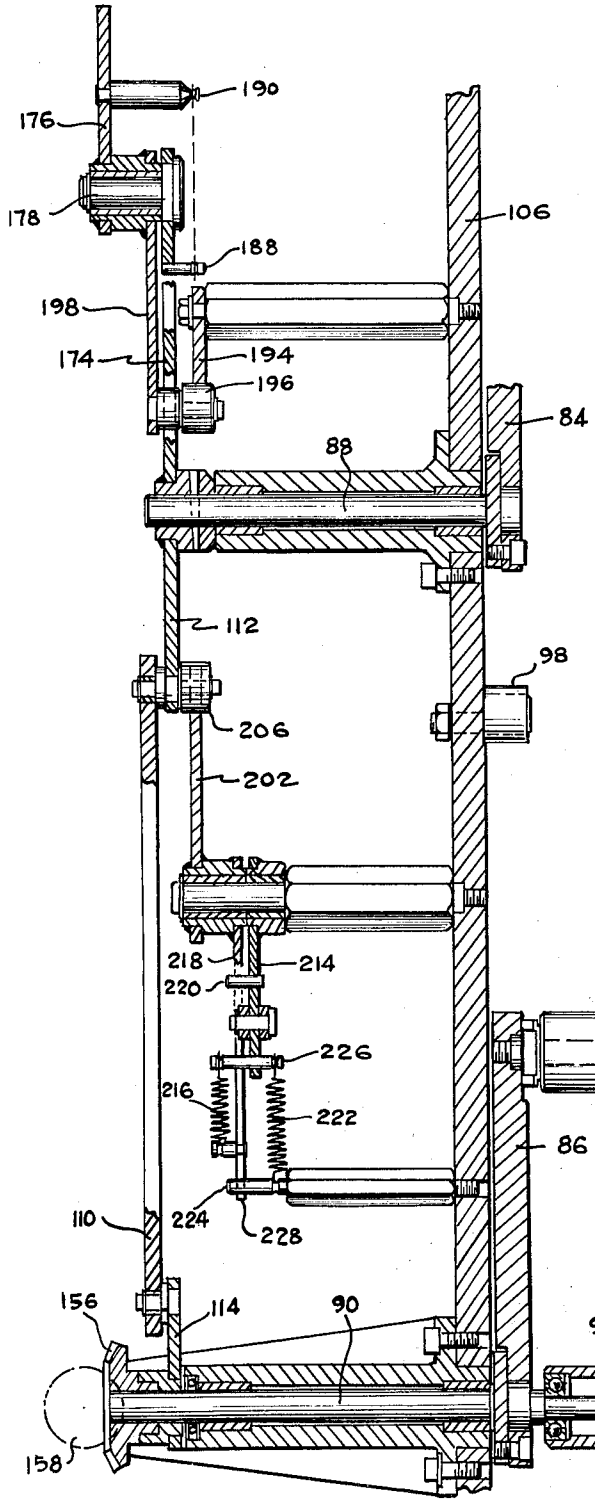

FIG. 10

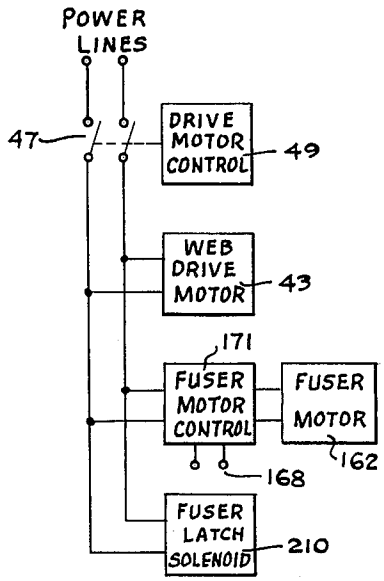

FIG. 13

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FUSER UNIT FOR ELECTRONIC PRINTING MACHINE

Filed Aug. 31, 1961 7 Sheets-Sheet 7

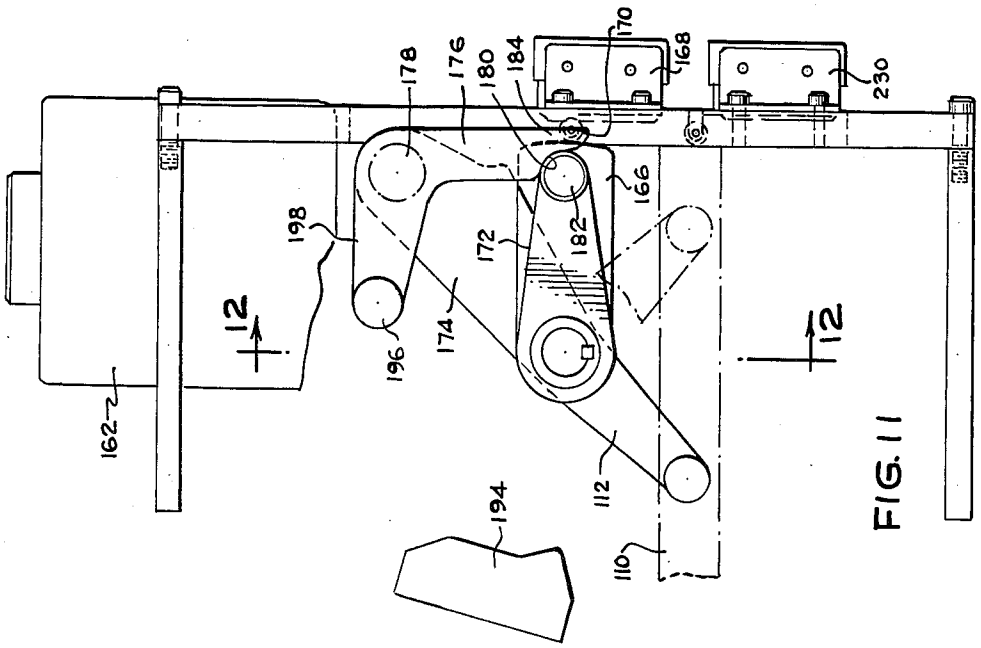

FIG. 11

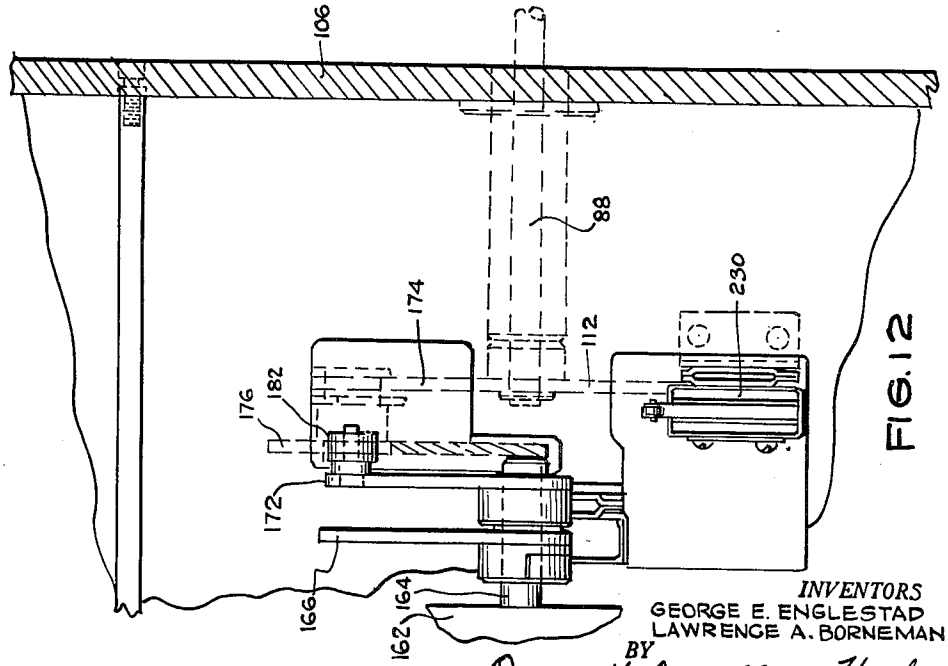

FIG. 12

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United States Patent Office 3,197,614 Patented July 27, 1965

3,197,614

FUSER UNIT FOR ELECTRONIC PRINTING MACHINE

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Filed Aug. 31, 1961, Ser. No. 135,375
9 Claims. (Cl. 219—388)

This invention relates to an electronic printing machine in which mailing addresses or the like are printed at extremely high speed on a paper tape by an arrangement comprising an electronic printer which produces an electrostatic image of each address on the tape, a developing device which renders the image visible by dusting it with a powdered material adapted to adhere to the electrostatic image, and a fusing device which fuses the powdered material so that it will adhere permanently to the tape.

One principal object of the present invention is to provide a new and improved fusing unit or device for an elecronic printing machine of the foregoing character.

A further object is to provide a new and improved fusing unit having infra-red tubes or the like to provide the heat necessary to fuse the powder to the tape, together with means for shifting the position of the running web of tape between a working position in which the tape runs in closely spaced relation to the infra-red tubes and a retracted position in which the tape is removed a considerable distance from the infra-red tubes, so as to prevent the tape from catching fire when the movement of the tape is stopped for any reason.

Another object is to provide a new and improved fuser of the foregoing character in which a reflector or heat shield is interposed between the source of heat and the retracted position of the tape, and in which the reflector is withdrawn as the tape is moved to its working position, and then is again advanced to a position behind the tape so as to enhance the heating effect of the source of heat.

A further object is to provide a new and improved fuser of the foregoing character in which the tape is automatically moved to its working position when the printing machine is started, and is automatically returned to its retracted position when the machine is stopped.

Another object is to provide a fuser mechanism of the foregoing character which is extremely rapid, dependable and efficient in operation.

Further objects and advantages of the present invention will appear from the following description, taken with the accompanying drawings, in which:

FIG. 1 is a front elevational view of an electronic printer comprising a fuser unit to be described as an illustrative embodiment of the present invention.

FIG. 2 is a fragmentary perspective view of the paper web or tape bearing the printed mailing addresses produced by the electronic printer.

FIG. 3 is a front elevational view of the fuser unit.

FIG. 4 is a fragmentary front elevational view with the front panel and various other components removed to reveal details of the mechanism.

FIG. 5 is a fragmentary plan view, taken generally as indicated by the line 5—5 in FIG. 4.

FIG. 6 is a side elevational view, taken generally as indicated by the line 6—6 in FIG. 3.

FIG. 7 is a fragmentary elevational section, taken along the line 7—7 in FIG. 6.

FIG. 8 is a fragmentary elevational section, taken along the line 8—8 in FIG. 7.

FIG. 9 is a fragmentary enlarged somewhat diagrammatic front elevational view showing a portion of the mechanism for shifting the position of the paper tape, the mechanism being shown with the tape in its working position.

FIG. 10 is a diagrammatic sectional view, taken generally along the line 10—10 in FIG. 3, with some of the components stretched out or developed for clarity of illustration.

FIG. 11 is a fragmentary elevational view somewhat similar to FIG. 9 but showing the mechanism in the position corresponding to the retracted position of the tape.

FIG. 12 is a fragmentary sectional view taken generally along a line 12—12 in FIG. 11.

FIG. 13 is a block-type circuit diagram showing the control arrangement for the fuser.

As already indicated, FIG. 1 illustrates a machine 20 for electronically printing address labels or the like, adapted to be applied to magazines or any other material to be sent through the mails. The address labels are printed on a paper tape 22 in the form of a continuous web. FIG. 2 illustrates the tape 22 in its final form, with mailing addresses 24 or the like printed thereon. Between the addresses 24, the tape 22 is punched with indexing holes 26. It will be understood that the tape 22 may be cut off successively at each of the holes 26 to separate the tape into individual mailing labels, which may be applied to magazines or the like. Automatic machines (not shown) may be employed to cut the labels from the tape and to apply the labels to the magazines.

The paper tape 22 is supplied to the printing machine 20 by a suitable supply mechanism (not shown) adapted to unroll the tape from a supply roll. The incoming tape 22 is threaded around a series of guide rollers 28, 30, 32 and 34, and then is caused to pass in front of an electronic printing tube or device 36 which produces an electrostatic image on the tape corresponding to each successive label to be printed. The tape then passes around a roller 38 to a punching and driving mechanism 40 which punches the indexing holes 26 in the tape and also pulls the tape past the electronic printing tube 36. The mechanism 40 comprises a drive roller 42 which is driven by a suitable motor 43 (FIG. 13). A guide roller 44 directs the tape over the drive roller 42. The tape is pressed against the roller 42 by a roller 46. The holes 26 are formed by punches mounted on a roller 48 which cooperates with the roller 42. The motor 43 may be energized through a relay switch 47, operable by a suitable control unit 49, which may incorporate a manual starting device and various safety devices, adapted to stop the motor if the web breaks or if various other contingencies occur.

After leaving the drive roller 42, the tape 22 passes over a guide roller 50 into developing mechanism or device 52 which renders the electrostatic images on the tape visible by dusting the tape with a suitable powdered material adapted to adhere to the electrostatic image by virtue of the electrostatic forces of attraction.

From the developer 52, the tape passes through a fuser unit 54 which applies heat to the tape so as to fuse the powdered material to the tape. The powdered material contains a suitable plastic material or the like adapted to form a permanent bond with the paper tape when the material is heated to a sufficient extent. The fuser unit is the subject of the present invention and will be described in detail shortly.

After passing through the fuser unit 54, the tape travels in a long flight 56 to a guide roller 58, and then travels in another long flight 60 to a guide roller 62. The passage of the tape along the long flights 56 and 60 allows time for the tape to cool so that the fused powder will harden and become permanently bonded to the tape.

After passing the roller 62, the tape is threaded around guide rollers 64, 66 and 68 before it travels away from

the printing unit 20 to the mechanism (not shown) adapted to utilize or rewind the tape. It will be understood that the printed tape may be rewound into a series of rolls which may be removed from the printing machine and transferred to the machines adapted to apply the printed labels to magazines or the like. A suitable rewinding mechanism is disclosed and claimed in the copending application of Allan I. Roshkind, Serial No. 104,467, filed April 20, 1961, now Patent No. 3,127,122. A suitable unit for supplying the unprinted web to the printing machine 20 is disclosed and claimed in the copending application of Allan I. Roshkind, Serial No. 98,206, filed March 24, 1961.

The fuser 54 must be capable of developing an extremely intense heat, because the tape 22 passes through the fuser at an extremely high speed. In this case, the heat source takes the form of a plurality of elongated tubular infra-red heating lamps 70, capable of supplying extremely intense infra-red radiation. The tape 22 passes beneath the lamps 70 as shown in FIG. 3. A reflector 72 is provided above the lamps 70 to direct the radiation from the lamps downwardly onto the tape 22. A second reflector 74 may be provided under the tape 22 to minimize the escape of radiation and to reflect escaping radiation upwardly against the lower side of the tape. It will be evident that the reflectors 72 and 74 constitute the upper and lower walls of an oven 76 through which the tape 22 passes, and in which the infra-red heating tubes 70 are located.

When the tape 22 passes at its normal working speed through the oven 76, the tape is heated by the lamps 70 to a sufficient extent to fuse the powdered printing material so that the printed image will be permanently bonded to the tape. In accordance with the present invention, provision is made for quickly retracting the tape from the oven 76 when the machine is shut down for any reason, so that the tape will not be subjected to the intense heat generated by the infra-red lamps 70 for any appreciable length of time when the tape is stationary or traveling at a low rate of speed. The heat of the lamps is so intense that the tape will quickly catch fire if it is allowed to remain in the oven while it is stationary or traveling at a slow speed. As already noted, the tape 22 is shown in its working position in FIG. 3. On the other hand, FIG. 1 shows the tape in its retracted or inactive position. The retracted position is also shown in broken lines in FIG. 3.

In order to provide for the movement of the tape between its retracted and working positions, the tape is threaded around a pair of guide rollers or members 80 and 82 which are movable between the full line and the broken line positions shown in FIG. 3. Various arrangements could be utilized to provide for the movement of the rollers 80 and 82, but in this instance the rollers are mounted on the ends of swingable arms 84 and 86, respectively, which are movable between the full and broken line positions shown in FIG. 3. The arms 84 and 86 are mounted on rotatable shafts 88 and 90. When the tape or web 22 is in its working position, the tape passes from the developer 52 around the roller 80, through the oven 76, and around the roller 82, and then around a roller 92 which is freely rotatable about the axis of the shaft 90. From the roller 92, the tape 22 passes along the flight 56 to the roller 58, as previously mentioned.

When the tape 22 is in its retracted position, the tape passes around a roller 94 in traveling between the developer 52 and the movable roller 80. It will be seen that the roller 94 is mounted on an arm 96 which is formed integrally with or secured to the arm 84. The arm 96 extends approximately at right angles to the arm 84. It will be seen that the roller 94 is spaced from the axis of the shaft 88 by an amount which is only a fraction of the spacing between the movable roller 80 and the axis of the shaft 88. The roller 94 has the effect of

taking up any slack that might tend to develop in the tape, between the developer and the roller 80, as the tape is moved to its retracted position. The roller 94 also minimizes the extent to which the angle of departure of the tape from the developer changes as the tape is moved between its working and retracted positions.

When the tape 22 is in its working position, the arms 84 and 86 are substantially vertical. The tape is retracted by swinging the arms 84 and 86 in a clockwise direction, as shown in FIG. 3, until the arms occupy substantially horizontal positions. The arms 84 and 86 are engageable with step pins or bumpers 98 and 100 which limit the clockwise movement of the arms. The manner in which the arms 84 and 86 are operated will be described in detail shortly.

As the tape 22 is moved between its working and retracted positions, the lower reflector or shield 74 is retracted momentarily so that the reflector will be withdrawn from the path of the tape. In this way, the reflector is prevented from interfering with the movement of the tape between its retracted and working positions. The reflector 74 is again extended as the tape is moved fully into its retracted and working positions so that the escape of the radiant heat from the oven 76 is minimized. The manner in which the reflector 74 operates will be described in detail shortly.

The operation of the heat lamps 70 is preferably controlled automatically so that the tape will be heated to a predetermined extent by the lamps. Thus, a heat sensing control device 102 may be positioned so that it responds to the temperature of the tape 22 as it passes along the flight 56. The device 102 regulates the operation of the heat lamps 70 so that the tape will be maintained at the desired temperature as it passes along the flight 56. A stationary heat shield 104 is provided between the oven 76 and the temperature sensing device 102 so that the device 102 will not be subjected to direct radiation from the heat lamps 70.

The components of the fuser 54 described thus far are mounted on the front of a front panel 106. The reflector 74 and the shafts 88 and 90 extend rearwardly through openings in the panel 106. To the rear of the panel 106, the shafts 88 and 90 are interconnected by means of a linkage 108 comprising an elongated link 110 which is pivotally connected to arms 112 and 114 which are secured to the shafts 88 and 90. Thus, through the action of the linkage 108, the rotation of the shaft 88 will cause the shaft 90 to rotate.

The mechanism is biased toward the position in which the tape 22 is in its retracted position. This is accomplished by means of a spring 116 which is mounted within an air check 118 of the type often employed for closing doors. It will be seen that the air check 118 comprises an air cylinder 120 which is pivotally connected to a stationary bracket 122. A piston 124 is slidable within the cylinder 120 and is secured to a piston rod 126 which is pivotally connected to the link 110. The spring 116 tends to draw the piston rod 126 and the link 110 to the left, as shown in FIG. 4, and thus tends to rotate the arms 84 and 86 in a clockwise direction. The action of the piston 124 and the cylinder 120 slows down the clockwise return movement of the arms 84 and 86 so that the arms return to their retracted positions in a gentle manner.

The advancing and retracting movement of the reflector 74 is synchronized with the movement of the arms 84 and 86 by means of a linkage 130 which is shown to advantage in FIGS. 4–8. It will be seen from FIGS. 7 and 8 that the edge portions of the reflector 74 are offset downwardly to form flanges 132 which are freely movable between upper and lower guide rollers 134 and 136. The rear portion of the reflector 74 is supported by a pair of elongated arms 138. The lower ends of the arms 138 are swingable about pivots 140 which are mounted on stationary brackets 142. It will be seen that the upper

ends of the arms 138 are swingably connected to the rear portion of the reflector 74 by means of pivots 144.

Links 146 may be employed to connect the arms to cranks 148 which are secured to a laterally extending horizontal shaft 150. Each link 146 is connected to the corresponding arm by a pivot 152. Similarly, each link 146 is connected to the corresponding crank 148 by a pivot 154.

In the illustrated construction, bevel gears 156 and 158 are employed to connect the shaft 150 to the shaft 90. As shown, gear 156 is secured to the shaft 90, while the gear 158 is secured to the shaft 150. In the illustrated arrangement, the gear 156 is twice as large as the gear 158 so that the shaft 150 will be rotated through an angle twice as great as the angle of rotation of the shaft 90. Accordingly, the shaft 150 is rotated through approximately 180 degrees, while the shaft 90 rotates through 90 degrees between the positions corresponding to the working and retracted positions of the paper tape 22. Such rotation of the shaft 150 swings the cranks 148 through one-half revolution and causes the arms 138 to be swung through a cycle in which the arms are first swung rearwardly to retract the reflector 74 and then are swung forwardly to advance the reflector to its original position. Thus, as the tape 22 is moved in either direction between its retracted and working positions, the reflector 74 is first withdrawn rearwardly so that it will be out of the way of the tape, and then is moved forwardly to its original position, under the oven 76.

The mechanism for moving the tape 22 between its retracted and working positions is operated by an electric motor 162 having a shaft 164 which is rotated through one complete revolution when the printing machine 20 is started. The motor 162 may drive the shaft 164 through reduction gears so that the shaft will turn at a relatively slow speed. To stop the motor 162 after one revolution of the shaft 164, a cam 166 is mounted on the shaft and is adapted to operate a switch 168. It will be seen from FIG. 11 that the switch 168 has an actuator in the form of a roller 170 which is engageable by the cam 166. Movement of the roller 170 actuates the switch 168 and causes the motor 162 to stop. As shown in FIG. 13, the motor 162 is energized through a suitable control unit 171 connected in parallel with the main drive motor 43.

The rotation of the motor shaft 164 is effective to swing the web control arms 84 and 86 through 90 degrees in a counterclockwise direction so that the web or tape 22 will be moved to its working position, as shown in full lines in FIG. 3. To bring about such movement of the arms 84 and 86, an arm 172 is mounted on the motor shaft 164. It will be observed from FIG. 12 that the motor shaft 164 is coaxial with the shaft 88 on which the arm 84 is mounted. To the rear of the front panel 106, the shaft 88 is also fitted with an arm 174 which may be formed integrally with the arm 112. A pawl 176 is connected to the outer end of the arm 174 by means of a pivot 178. It will be seen that the pawl 176 has an outer end portion 180 which is adapted to be engaged by a roller 182 mounted on the outer end of the motor arm 172. The outer end portion 180 of the pawl 176 is concave and in the form of a segment of a circle so as to fit over the roller 182. The pawl 176 has a finger 184 which extends outwardly beyond the curved portion 180 on the outer side of the roller 182.

A spring 186 is provided to bias the pawl 176 in a clockwise direction with respect to the arm 174. The spring 186 is stretched between pins 188 and 190 on the arm 174 and the pawl 176. The pin 190 is engageable with a stop surface 192 on the arm 174 to limit the clockwise movement of the pawl relative to the arm.

As shown in FIG. 11, the motor arm 172 is initially in a generally horizontal position. When the motor 162 is started by the energization of the printing machine 20, the roller 182 engages the pawl 176 and pushes the pawl and the arm 174 in a counterclockwise direction, against the biasing action of the spring 116 in the air check 118. Of course, the arms 84 and 86 are rotated with the arm 174.

When the arm 174 has been rotated through approximately 90 degrees, the pawl 176 is released from the roller 182 by the action of a stationary cam 194 which is engageable with a roller 196 mounted on an arm 198 which is secured to the pawl 176. When the roller 196 engages the cam 194, the pawl 176 is swung counterclockwise relative to the arm 174 to the position shown in full lines in FIG. 9. In this position, the pawl 176 is released from the roller 182 so that the roller can move past the pawl. In moving past the pawl, the roller 182 swings the pawl to a greater extent, as indicated in broken lines in FIG. 9.

A latching mechanism 200 is provided to prevent the arm 174 from returning to its initial position when the pawl 176 is released from the roller 182. It will be seen from FIG. 9 that the mechanism 200 comprises a latching arm 202 which is swingable about a pivot 204. The arm 202 is engageable with a roller 206 mounted on the arm 112. It will be seen that the outer end of the arm 202 is formed with a latching notch 208 which is engageable with the roller 206 just before the pawl 176 is released from the roller 182. Thus, the arms 112 and 174 are latched in a position displaced approximately 90 degrees from their initial positions.

The latching arm 202 is adapted to be operated by a solenoid 210 which may be connected in parallel with the main drive motor 43 (FIG. 13). With this arrangement, the solenoid 210 is energized whenever the printing machine 20 is running and is de-energized whenever the printing machine is stopped. The energization of the solenoid 210 causes the latch 202 to swing in a counterclockwise direction so that it can move into latching engagement with the roller 206. When the solenoid 210 is deenergized, the latch 202 is moved in a clockwise direction, out of engagement with the roller 206. This releases the arms 112 and 174 so that they are free to return to their initial position, under the biasing action of the spring 116. Thus, the de-energization of the solenoid 210 causes the return of the tape 22 to its retracted position.

It will be seen from FIG. 9 that the solenoid 210 has an armature 212 which is connected to an arm 214 by means of a link 216. The arm 214 is rotatable about the pivot 204 but is not directly connected to the latching arm 202. Instead, a spring 216 is stretched between the arm 214 and an arm 218 which is secured to the latching arm 202. A stop pin 220 is mounted on the arm 214 and is engageable with the arm 218 to limit the extent to which the arm 218 can be rotated in a counterclockwise direction by the spring 216. It will be seen that a return spring 222 normally biases the arm 214 in a clockwise direction. The spring 222 is stretched between a fixed anchor pin 224 and a pin 226 on the arm 214. The arm 218 is formed with a finger 228 which is engageable with the pin 224 to limit the extent to which the arms 214 and 218 can be swung in a clockwise direction by the spring 222.

When the solenoid 210 is energized, the arm 214 is swung in a counterclockwise direction. The spring 216 moves the arm 218 and the latch 202 in a counterclockwise direction. Thus, the latch 202 is moved into the path of the roller 206. After the arms 84, 112 and 174 have been rotated through approximately 90 degrees, the roller 206 moves into the notch 208 in the latch 202. When the solenoid 210 is de-energized, the spring 222 swings the arms 214 and 218 and the latch 202 in a clockwise direction so as to disengage the latch from the roller 206. The spring 116 then returns the arms 84, 112 and 174 in a clockwise direction to their initial positions. The air check 118 controls this return movement so that it will not be unduly abrupt. When the arms 84 and 86 have been swung to the upright positions, the link 110 operates a switch 230 (FIG. 11) which produces a signal adapted to start the printing operation. This arrange-

ment prevents the printing operation from starting until the tape 22 has been moved to its working position in the fuser 54.

In conclusion, it may be helpful to summarize the operation of the fuser 54. When the printing machine 20 is started, the drive motor 43 for the roller 42 is energized, causing the tape 22 to be pulled through the electronic printer 36. At the same time, the fuser actuating motor 162 is energized. This causes the arm 172, the roller 182 and the cam 166 to rotate through one revolution. The motor 162 is stopped when the cam 166 operates the switch 168.

The roller 182 engages the pawl 176 and swings the arm 174 through approximately 90 degrees, whereupon the roller 196 engages the stationary cam 194 and releases the pawl 176 from the roller 182. However, the arm 174 is retained in its displaced position by the latch 202 which engages the roller 206 just before the pawl 176 is released from the roller 182. The latch 202 is swung into its active position by the solenoid 210 which is energized whenever the printing machine 20 is running. The rotation of the arm 174 causes the web control arms 84 and 86 to swing from their initial positions, shown in FIG. 1, to their upright positions, shown in FIG. 3. This moves the tape 22 from its retracted position to its working position, immediately beneath the infra-red heat lamps 70. During such movement of the web or tape 22, the lower reflector 74 is moved out of the way by the action of the crank arms 148 which are rotated through approximately 180 degrees by the gears 156 and 158. As the tape 22 completes its movement to the working position, the lower reflector 74 is again advanced into its extended position under the path of the tape. The heat lamps 70 develop an intense heat which fuses the plastic powder to the tape 22 so that the printed images, produced by the electrostatic printer 36 and the developer 52, become permanently bonded to the tape.

If the printing machine 20 is stopped for any reason, either purposely by the operator or by the operation of any control or safety device, the solenoid 210 is de-energized. The spring 222 then disengages the latch 202 from the roller 206 so that the spring 116 can return the arms 84 and 86 in a clockwise direction to their initial positions. The air check 118 controls this return movement and prevents it from being unduly abrupt. As the tape 22 is moved downwardly away from the heat lamps 70, the lower reflector 74 is moved out of the way by the action of the crank arms 148. The reflector 74 is again advanced to its extended position as the tape 22 reaches its retracted position. In its retracted position, the tape 22 is spaced sufficiently from the heat lamps so that there is no danger that the heat lamps will cause the tape to catch fire, even though the longitudinal movement of the tape through the machine has stopped. During the normal operation of the machine, the tape moves at such a high speed through the fuser that the tape will not be heated sufficiently to catch fire, the heating effect being only sufficient to fuse the printed image to the tape.

Various modifications, alternative constructions and equivalents may be employed without departing from the true spirit and scope of the invention as exemplified in the foregoing description and defined in the following claims.

We claim:

1. In a mechanism for fusing an image composed of powdered plastic material to a paper tape, the combination comprising a plurality of elongated heat lamps, a fixed reflector on one side of said heat lamps, a movable reflector on the other side of said heat lamps, first and second arms swingable between a working position and a retracted position, said arms extending toward said heat lamps when said arms are in said working position and being moved away from said heat lamps when said arms are in said retracted position, guide rollers on said arms for guiding a web of paper tape between said heat lamps and said movable reflector when said arms are in said working position, means for directing the web along said guide rollers, said means including a third roller mounted coaxially with the axis of swinging movement of said first arm, and a fourth roller mounted on said second arm adjacent the axis thereof, means interconnecting said arms for simultaneous swinging movement, said web being translated transversely away from said heat lamps when said arms are swung between their working positions and their retracted positions, a mechanism for retracting and advancing said movable reflector, said mechanism comprising a crank coupled to said arms for advancing said movable reflector when said arms are in their working and retracted positions while retracting said reflector while said arms are moving between said working and retracted positions, a spring biasing said arms toward said retracted positions thereof, and an actuating mechanism for moving said arms to said working positions thereof, said actuating mechanism comprising a motor having an output shaft, means for operating said motor so as to rotate said output shaft through a single revolution, an actuating arm on said motor shaft, a pawl operable by said actuating arm and coupled to said first and second arms, a latch for retaining said first and second arms in said working positions thereof, a solenoid for actuating said latch, and a cam for releasing said pawl from said actuating arm upon movement of said first and second arms to said working positions, said latch having a return spring for releasing said latch when said solenoid is de-energized.

2. In a device for applying intense heat to a web, the combination comprising a heat source, movable guide means for directing the web along a working path adjacent the heat source, means for changing the position of said guide means to translate the web away from the heat source to a retracted position, a movable reflector disposed adjacent said working path of the web, said working path extending between said movable reflector and said heat source, and means synchronized with the movement of said movable guide means for advancing the reflector to its normal position when the web is in its working path and in its retracted position, while retracting the reflector out of the way of the web while the web is being moved between its working path and its retracted position.

3. In a device for applying intense heat to a web, the combination comprising a heat source, movable guide means for directing the web along a working path adjacent said heat source, said movable guide means being movable to a retracted position in which said web is translated from its working path away from said heat source to protect the web against being overheated, means biasing said movable guide means to said retracted position, a motor for moving said guide means to the working position thereof, a latch for retaining said guide means in the working position, and a solenoid for operating said latch, said latch having biasing means for releasing said latch when said solenoid is de-energized.

4. In a device for applying intense heat to a web, the combination comprising guide means for directing the web along a working path adjacent the heat source when said guide means are in a working position, said guide means being movable to a retracted position and thereby being effective to translate the web away from the heat source to a retracted position for protecting the web against overheating, a movable reflector adjacent the working path of the web, said working path being disposed between the heat source and the reflector, a reflector mechanism synchronized with said movable guide means for advancing and retracting the reflector, said reflector mechanism comprising means coupled to said movable guide means for advancing said reflector when said guide means are in their working and retracted positions, while retracting said reflector when said guide means are moved between said working and retracted positions, means for biasing

said guide means toward said retracted position, a motor for moving said guide means to said working position, a latch for retaining said guide means in said working position, and a solenoid for operating said latch, said latch having biasing means for releasing said latch when said solenoid is de-energized.

5. In a device for fusing a coating to a paper web, the combination comprising an elongated heat source, a movable elongated reflector adjacent said heat source, first and second control arms swingable between working and retracted positions, rollers on said control arms for guiding the web between the heat source and the reflector when said arms are in said working position, the web being translated away from the heat source when said arms are swung to said retracted position, means interconnecting said arms for simultaneous movement, a mechanism connected to one of said arms for advancing said reflector when said arms are in said working and retracted positions while retracting said reflector when said arms are moved between said working and retracted positions, means biasing said control arms toward said retracted position, a motor having a pawl actuating element operable through a single revolution, a pawl coupled to said control arms and engageable with said element for swinging said control arms to said working position, means for disengaging said pawl from said element upon movement of said control arms to said working position, a latch for retaining said control arms in said working position, a solenoid for actuating said latch, and biasing means for releasing said latch when said solenoid is de-energized.

6. In a device for applying intense heat to a web, the combination comprising guide means for directing the web along a working path adjacent the heat source when said guide means are in a working position, said guide means being movable to a retracted position and thereby being effective to translate the web away from the heat source to a retracted position for protecting the web against overheating, a movable reflector adjacent the working path of the web, said working path being disposed between the heat source and the reflector, a reflector mechanism synchronized with said movable guide means for advancing and retracting the reflector, said reflector mechanism comprising means coupled to said movable guide means for advancing said reflector when said guide means are in their working and retracted positions, while retracting said reflector when said guide means are moved between said working and retracted positions, means for biasing said guide means toward said retracted position, power means for moving said guide means to said working position, a latch for retaining said guide means in said working position, and additional power means for operating said latch.

7. In a device for fusing a coating to a paper web, the combination comprising an elongated heat source, a movable elongated reflector adjacent said heat source, first and second control arms swingable between working and retracted positions, rollers on said control arms for guiding the web between the heat source and the reflector when said arms are in said working position, the web being translated away from the heat source when said arms are swung to said retracted position, means interconnecting said arms for simultaneous movement, a mechanism connected to one of said arms for advancing said reflector when said arms are in said working and retracted positions while retracting said reflector when said arms are moved between said working and retracted positions, means biasing said control arms toward said retracted position, and power means for effecting movement of said control arms between said retracted and working positions.

8. In a device for fusing a coating to a paper web, the combination comprising an elongated heat source, first and second control arms swingable between working and retracted positions, rollers on said control arms for guiding the web past the heat source when said arms are in said working position, the web being translated away from the heat source when said arms are swung to said retracted position, means interconnecting said arms for simultaneous movement, means biasing said control arms toward said retracted position, a motor having a pawl actuating element operable through a single revolution, a pawl coupled to said control arms and engageable with said element for swinging said control arms to said working position, means for disengaging said pawl from said element upon movement of said control arms to said working position, a latch for retaining said control arms in said working position, a solenoid for actuating said latch, and biasing means for releasing said latch when said solenoid is de-energized.

9. In a device for applying intense heat to a web, the combination comprising a heat source, movable guide means for directing the web along a working path adjacent said heat source, said movable guide means being movable to a retracted position in which said web is translated from its working path away from said heat source to protect the web against being overheated, means biasing said movable guide means to said retracted position, power means for moving said guide means to the working position thereof, a latch for retaining said guide means in the working position, and a solenoid for operating said latch, said latch having biasing means for releasing said latch when said solenoid is de-energized.

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