United States Patent

Marinoff

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[45] **Mar. 14, 1972**

[54] CARRIAGE FOR EMBOSSING MACHINE

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[21] Appl. No.: **794,898**

[52] **U.S. Cl.** **197/6.2**, 197/82, 197/176, 197/6.7

[51] **Int. Cl.** **B41j 1/00**

[58] **Field of Search** 197/2, 3, 6, 6.1, 6.2, 6.3, 197/6.4, 6.5, 6.6, 6.7, 63, 82, 84, 84.1, 84.2, 84.3, 85, 86, 87, 88, 124, 176, 114; 74/1.5, 575

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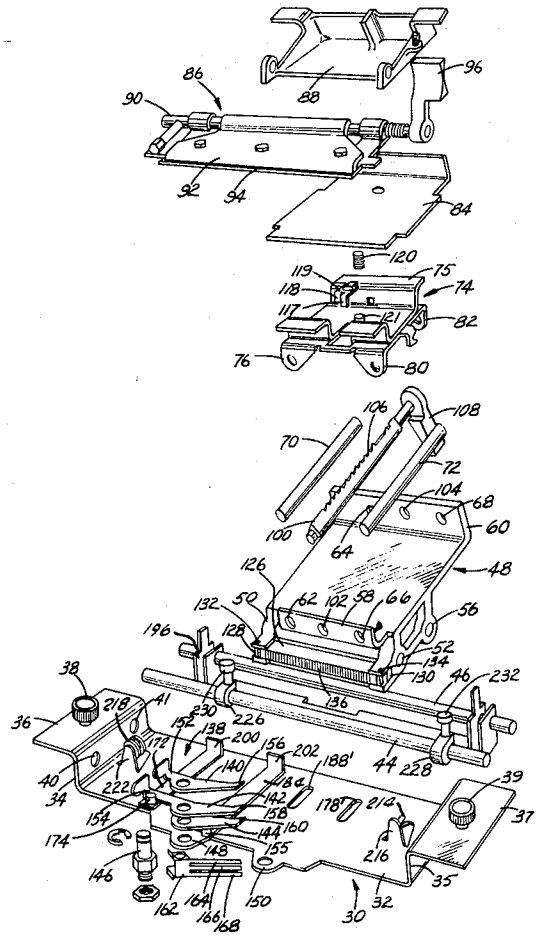
[57] **ABSTRACT**

In the environment of a disc embossing machine, employing a rotary shaft to apply cam embossing pressure, a separable and reversible carriage for positioning a card to be embossed. Either cams on the shaft, or levers on the carriage frame, operate a finger-rack escapement for letter spacing. A cross slide for line spacing is registered by a rocking rack-bar and cooperating escapement fingers.

4 Claims, 15 Drawing Figures



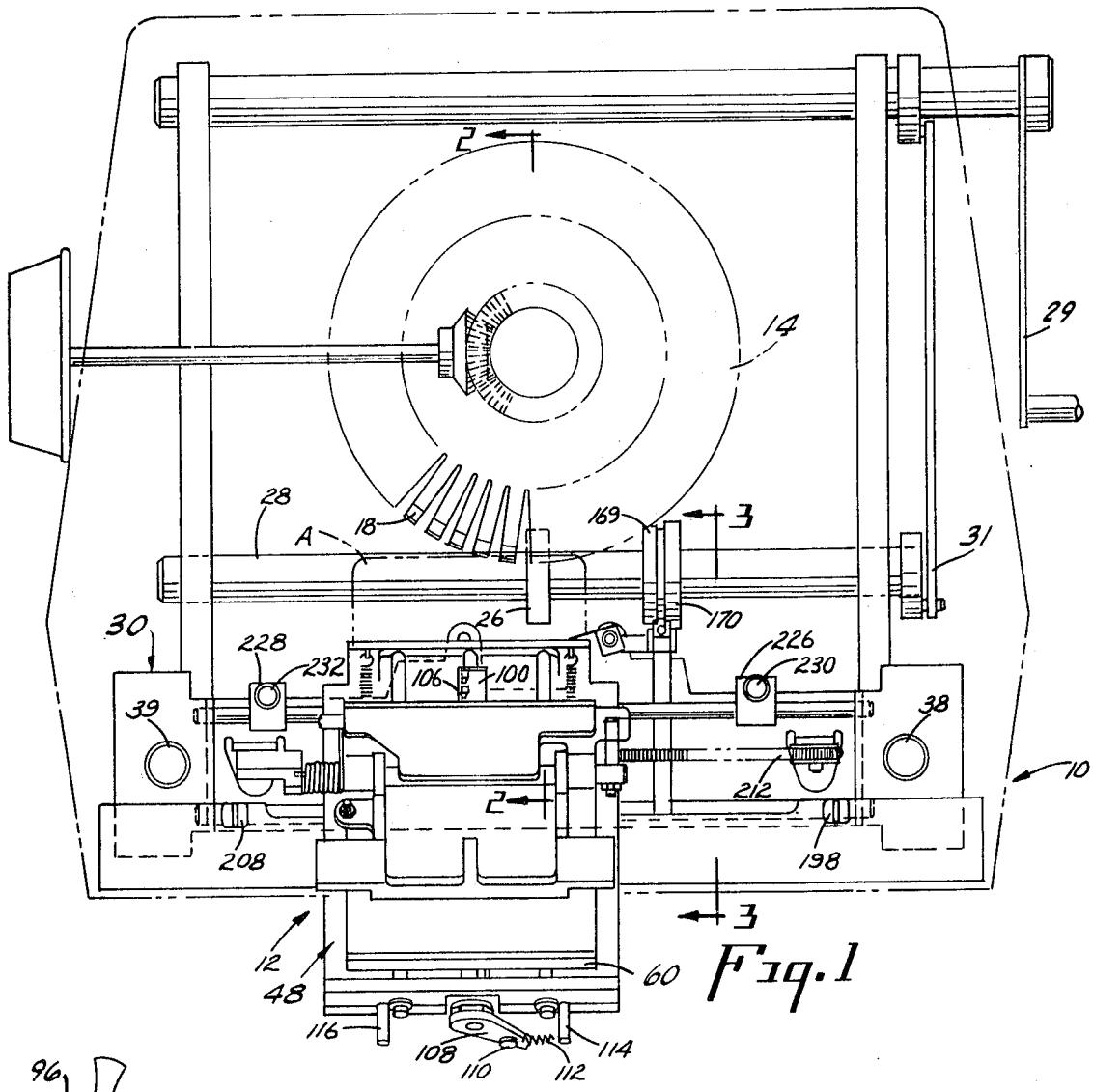


Fig. 1

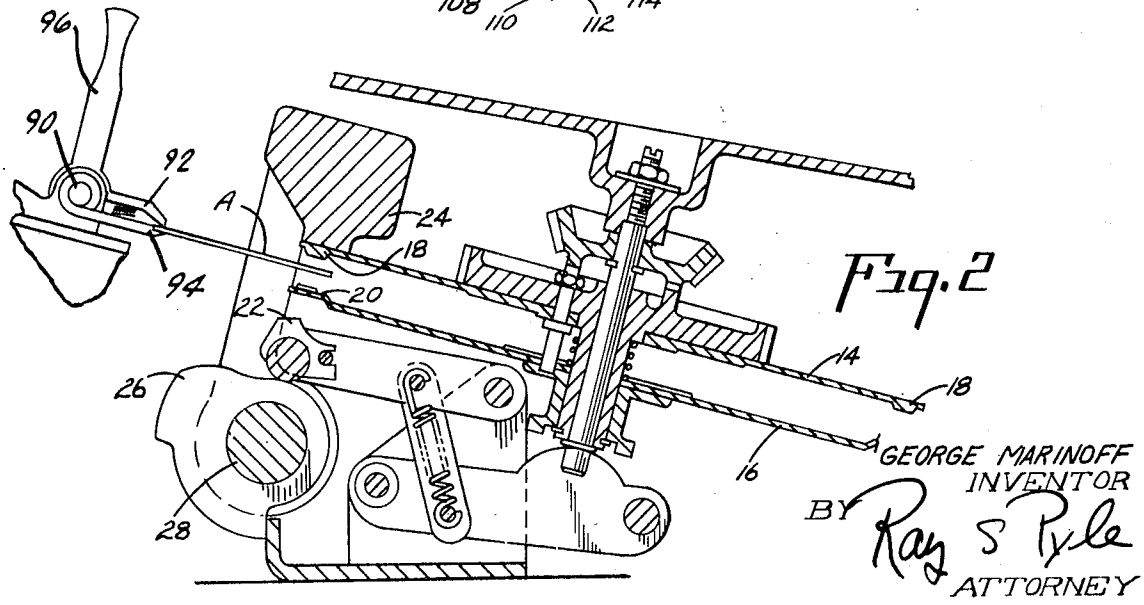


Fig. 2

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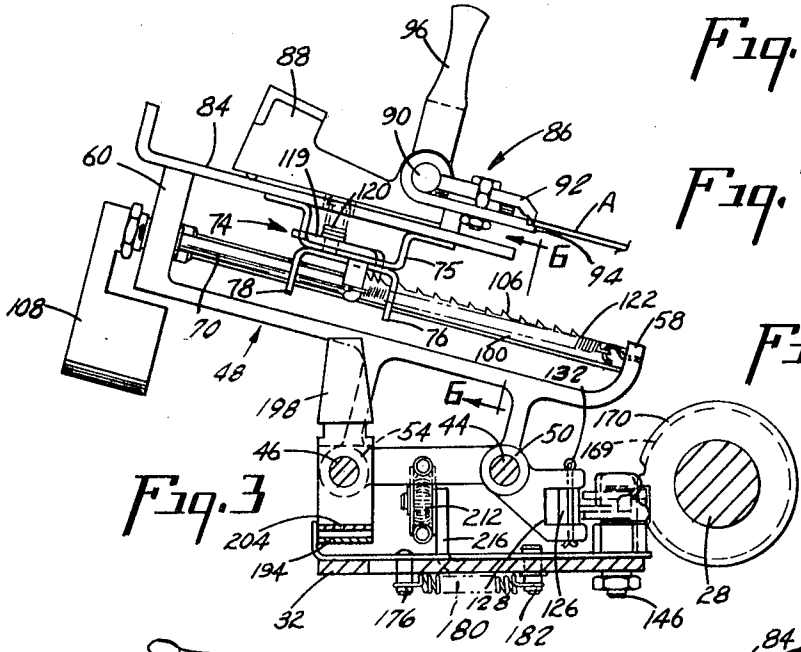

Fig. 3

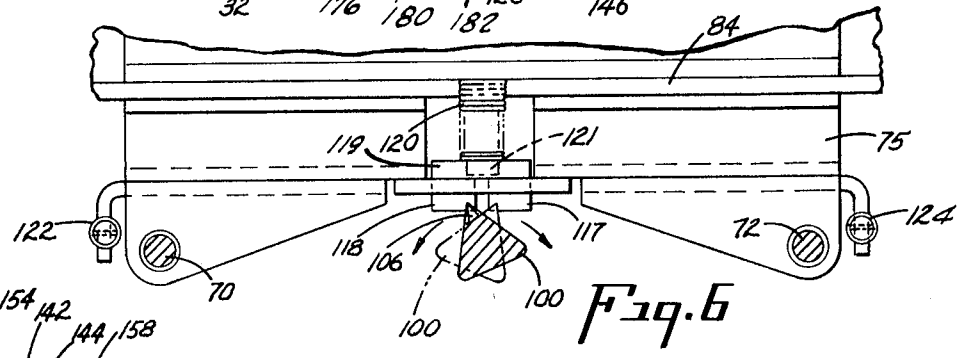

Fig. 6

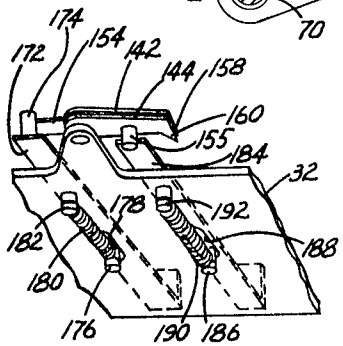

Fig. 9

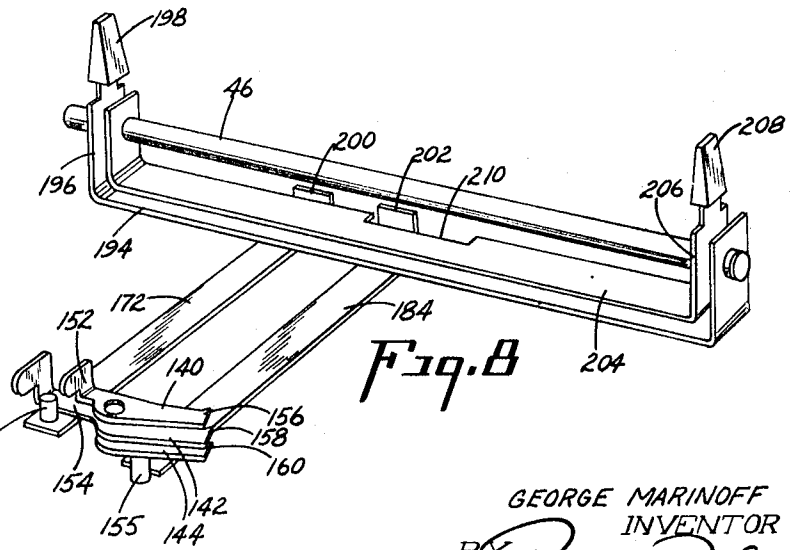

Fig. 8

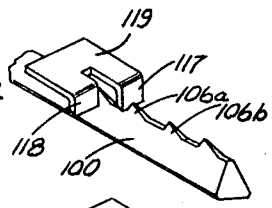

Fig. 7a

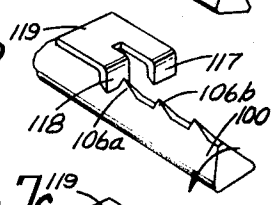

Fig. 7b

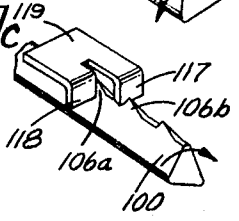

Fig. 7c

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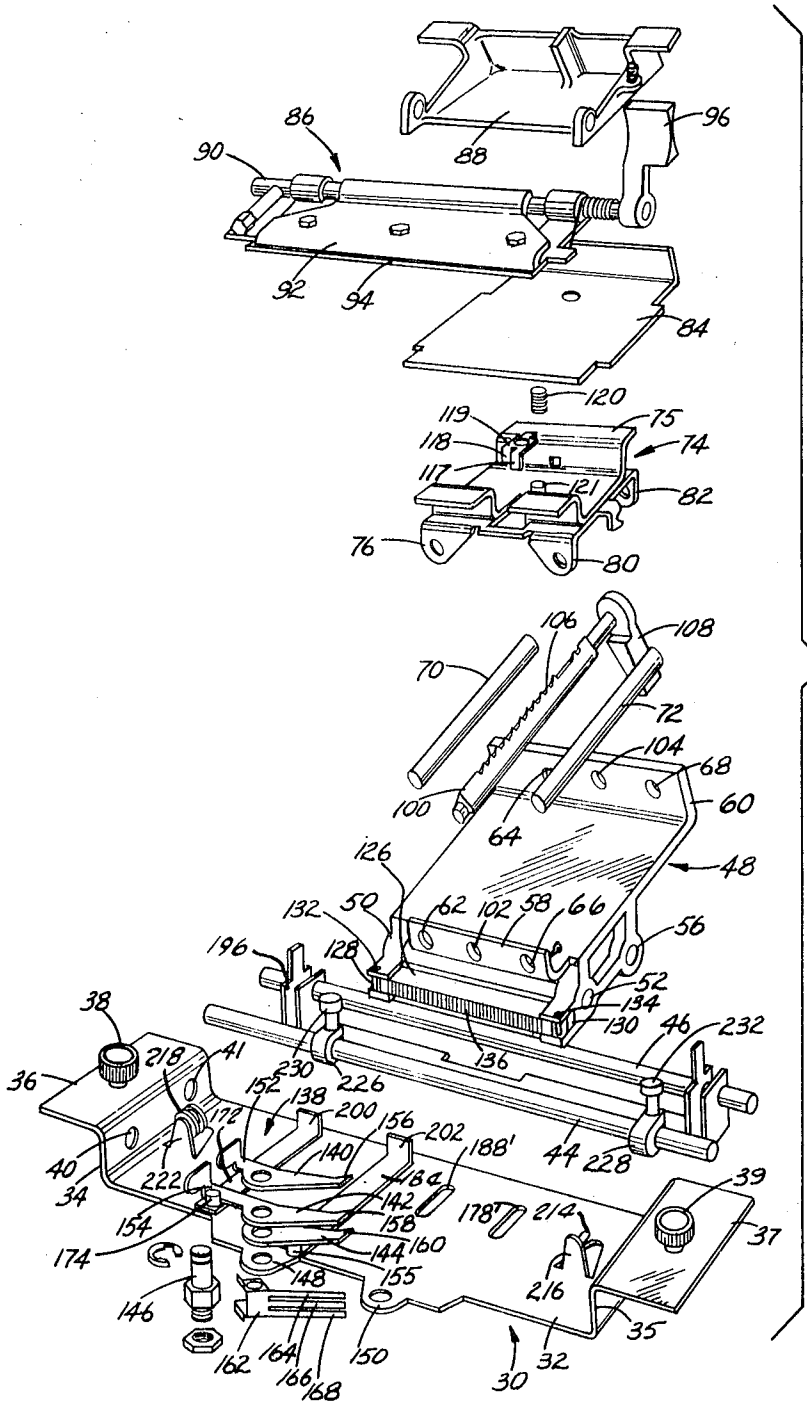

Fig. 4

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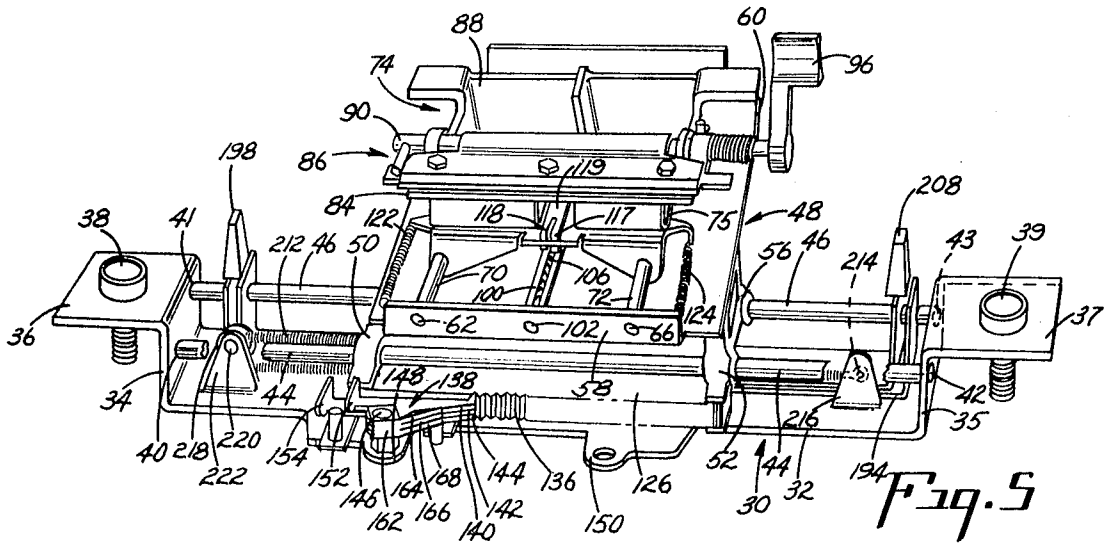

Fig. 5

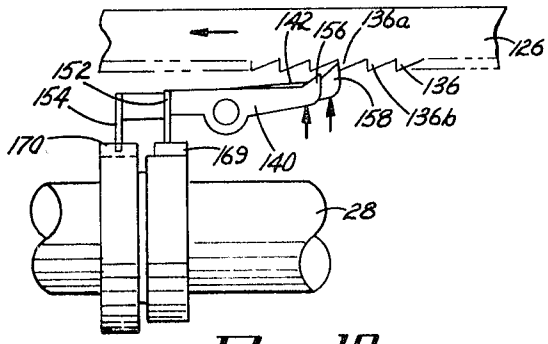

Fig. 10a

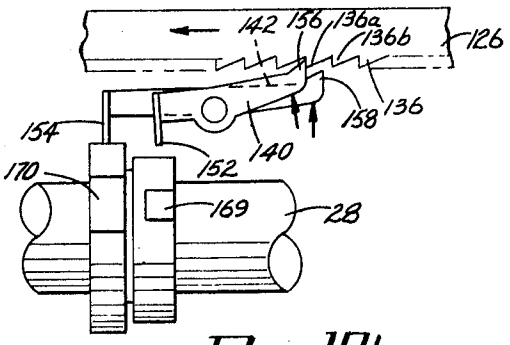

Fig. 10b

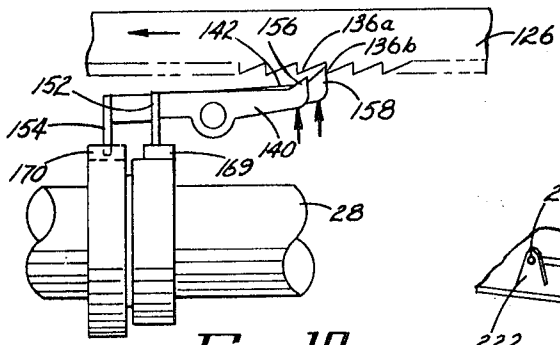

Fig. 10c

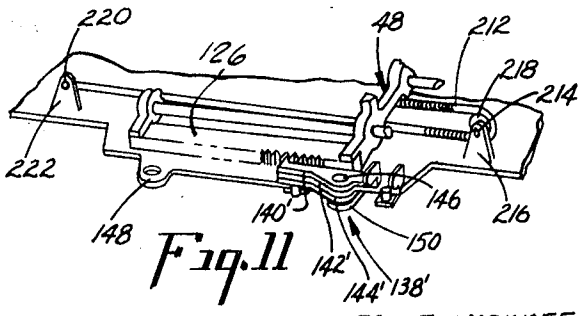

Fig. 11

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CARRIAGE FOR EMBOSSING MACHINE

This invention relates generally to carriages for holding and advancing articles, and more particularly to carriages for holding and advancing articles for embossments in an embossing machine.

The invention is directed to a carriage for mounting flat articles, such as credit cards, address plates or the like, in an embossing machine and to move the article incrementally to emboss several lines of characters thereon. Although the carriage of this invention is not so limited, it is particularly adapted for use in a disc type embossing machine of the type shown in copending application, Ser. No. 784,558 filed Dec. 18, 1968 by Fritz A. Deutsch and entitled Embossing Device.

One of the features of this invention is the provision of a carriage having an article mounting device and actuating mechanism therefore which permits simple, yet accurate line and character spacing of the embossments.

Still another feature of the present invention is the provision of a character spacing mechanism that can be easily adapted for escapement to either the right or the left, depending on whether human readable or printing type characters are being formed.

Still another feature of this invention is the provision of a carriage which can be easily inserted and removed from an embossing machine for cleaning and normal maintenance.

These and other features of the invention, together with a fuller understanding thereof, will become apparent from the following description taken with the accompanying drawing in which:

FIG. **1** is a plan view with the cover shown in phantom outline of an embossing machine employing a carriage of this invention;

FIG. **2** is a sectional view taken substantially along the plane designated by the line **2—2** of FIGURE **1**;

FIG. **3** is a sectional view taken substantially along the plane designated by the line **3—3** of FIGURE **1**;

FIG. **4** is an exploded perspective view of the carriage and operative mechanisms associated therewith;

FIG. **5** is a front perspective view of the carriage;

FIG. **6** is a sectional view taken substantially along the plane designated by the line **6—6** of FIGURE **3**;

FIGS. **7***a*, **7***b* and **7***c* are sequential perspective views of the operation of the escapement mechanism for line spacing;

FIG. **8** is a perspective view of the tab and space bars and their operative interconnection with the advancing pawls;

FIG. **9** is a bottom perspective view of the biasing of slides operated by the tab bars and spacing bars;

FIGS. **10***a*, **10***b* and **10***c* are detailed sequential views of the operation of the pawls and rack and cams for character spacing; and

FIG. **11** is a perspective view of the carriage with the pawls replaced and the rack reversed for opposite direction operation.

Basically, the present invention contemplates a provision of a carriage mechanism and associated operating devices, which carriage mechanism will support a flat article for successive embossments and move the article successively for character spacing and line spacing as required. The carriage mechanism includes an article engaging device adapted to grip the edge of a flat card or the like to be embossed. The gripping device is maintained on a platform, and an escapement mechanism is provided to incrementally advance the platform longitudinally toward and away from an embossing station to provide for line spacing. The platform in turn is mounted for lateral movement, and a second escapement mechanism is provided to cause incremental movement of the platform to thus provide for character spacing after each successive embossment.

A further desirable feature of the carriage mechanism is a design thereof wherein merely by reversing a rack and several biasing springs and slides and replacing a few dogs, the same carriage can operate either in one direction of character spacing to allow human readable type embossments to be made, or operate in the opposite direction to allow printing type embossments to be made.

EMBOSSING MACHINE ENVIRONMENT

More specifically, referring now to the drawing, and for the present FIGS. **1** and **2**, an embossing machine designated generally as **10** is shown, which incorporates the carriage mechanism, generally designated as **12** of this invention. Although the carriage mechanism **12** is suitable for use in many different types of embossing machines, it is especially adapted for use on the type of machine shown in copending application Ser. No. 784,588, filed Dec. 18, 1968 by Fritz A. Deutsch and entitled Embossing Device. A pair of spaced discs **14** and **16** have character die and punch sets **18** and **20**, arranged at the ends of radiating fingers thereof. The punch and die sets **18** and **20** are arranged to form character embossments on an article designated generally as "A". The embossing is done by rotating the discs **14** and **16** to arrange the proper character sets **18** and **20** at an embossing station. The lower disc **16** is then raised vertically until both the punch and die sets **18** and **20** close against opposite sides of the article A. Embossing pressure is then generated by an embossing head **22** squeezing the character **20** against the character **18** with the article A interposed therebetween. The reaction forces from the embossing are carried on a yoke or frame member **24**. Closure and embossing pressure is effected by a cam **26** mounted on a rotatable shaft **28**. The shaft **28** is rotated by actuating a crank **29** which is connected with the shaft **28** by a link **31**. The operation of this embossing mechanism is described in detail in said copending application, and the mechanism for performing the embossment per se forms no part of this invention.

CARRIAGE STRUCTURE AND MOUNTING

Referring now to FIGS. **3** through **5**, the carriage structure is shown in detail. As can best be seen in FIGS. **4** and **5**, the carriage structure **12** includes a generally U-shaped support frame **30** having a bottom section **32**, a pair of upturned flanges **34** and **35** and a pair of horizontal flanges **36** and **37**. The horizontal flanges **36** and **37** are each provided with through bolts **38** and **39**, which bolts **38** and **39** are adapted to detachably secure the carriage structure **12** to the embossing machine **10** (See FIGURE **1**).

Still referring to FIGS. **4** and **5**, the upturned flange **34** is provided with a pair of apertures **40** and **41**, and the upturned flange **35** is provided with a pair of apertures **42** and **43**. A mounting rod track **44** extends between the apertures **40** and **42** in the opposite flanges **34** and **35**, and a similar mounting rod **46** extends between the apertures **41** and **43** on the opposite flanges **34** and **35**. The rods **44** and **46** provide a pair of tracks slidably mounting a platform **48** for reciprocal movement laterally thereon. (The term "laterally" is used herein denotes a direction generally parallel to a line tangent to the embossing discs **14** and **16**, and the term "longitudingal" denotes a direction generally normal to a tangent to said discs **14** and **16**, i.e., radially). The platform **48** is mounted on the bars **44** and **46** by means of a pair of depending lugs **50** and **52** which mount on the bar **44** and a second pair of depending lugs **54** (shown in FIG. **3**) and **56** which mount on the bar **46**.

See FIG. **4**. The platform **48** is provided with a front upturned flange **58** and a rear upturned flange **60**. A first pair of aligned holes **62** and **64** are provided respectively in the front and rear flanges **58** and **60** at one side thereof, and a second pair of aligned holes **66** and **68** are provided respectively in the front and rear flanges **58** and **60** on the opposite sides thereof. A first rod **70** extends between the holes **62** and **64**, and a second rod **72** extends between the holes **66** and **68**. The rods **70** and **72** serve to mount a slidable dolly structure generally designated as **74** for longitudinal movement reciprocally thereon. The dolly **74** includes a slide member **75** having a first pair of lugs **76** and **78** (see FIGS. **3**) depending therefrom, slidably mounted on rod **70**, and a second pair of lugs **80** and **82** depending therefrom slidably mounted on rod **72**.

The slide member **75** has secured to the upper portion thereof a mounting plate **84** to which is mounted an article

holding device **86**. The article holding device **86** includes an anchor plate **88** which journals at one end thereof a shaft **90**. The shaft **90** mounts a pair of gripping jaws **92** and **94**, which gripping jaws **92** and **94** are adapted to grip a flat article to be embossed. The operation of this type of gripping jaw is shown and described in U.S. Pat. No. 2,999,577 dated Sept. 12, 1966. This type of gripping jaw is operable by a handle **96** secured to the shaft **90** which which rotates the jaws **92** and **94** between a rearward position for loading the card A and a frontward position for mounting the card A in embossing position. The gripping jaws **92** and **94** are so constructed, and spring biasing means are provided, so that when the handle **96** is operated to rotate the jaws **92** and **94** to the rearward position, the force of the biasing springs are overcome allowing the jaws **92** and **94** to be slightly open. The edge of the card, or other article A to be embossed, is then inserted between the jaws **92** and **94**, pressure is released from the handle **96**, and the spring biasing means then cause the jaws **92** and **94** to spring back together securely gripping the edge of the article A.

The rotation of the handle **96** from this rearward position will then flip the article A over and position it on the plane in which the embossing is to take place, as shown in FIGS. **2** and **3**.

LINE SPACING ESCAPEMENT MECHANISM

In order to incrementally move the article A into embossing position, and to provide for line spacing, a first escapement mechanism is provided to allow incremental longitudinal movement. The first escapement mechanism, as can best be seen in FIGS. **3** through **5**, includes a shaft **100** journaled in apertures **102** and **104** formed in the flanges **58** and **60** respectively of the platform **48**. The shaft **100** is generally triangular in shape and has a row of teeth **106** formed on the top thereof. The teeth **106** have vertical rear faces and sloping front faces (as used herein "front" refers to the direction toward the embossing apparatus, and "rearward" is the direction away from the embossing apparatus). A handle **108** is secured to the end of the shaft **100** and is operable to oscillate or rock the shaft **100** back and forth.

As shown in FIG. **1**, the handle **108** is provided with a projecting pin **110**. A spring **112** engages pin **110** and one or the other of posts **114** or **116**. The posts **114** and **116** are mounted on the flange **58** of platform **48** on opposite sides of the handle **108**. The post **114**, **116** with which the opposite end of the spring **112** is engaged will depend on whether the carriage mechanism **12** is going to be used to normally move from left to right or right to left, which in turn depends on whether the device is to be used for human readable embossments or printing type embossments and the arrangement of the discs **14** and **16**, as will be discussed presently. As shown, the spring **112** is secured to the post **114** and this is the arrangement when the carriage mechanism **12** is to be returned from left to right as seen in FIG. **1**.

Referring again to FIGS. **3** through **6**, the shaft **100** extends under the slide **75** and is adapted to cooperate with a pair of detents **117** and **118** (see FIG. 7A–7C) formed on a bracket **119** mounted on the top of slide **75**. The detents **117** and **118** depend through an aperture (unnumbered) in the slide **75**. The bracket **119** is biased downwardly into contact with the slide **75** by a spring **120** extending between mounting plate **84** and bracket **119**. The spring **120** surrounds a guide pin **121** extending upwardly from the bracket **119** into an aperture (unnumbered) in the mounting plate **84**. See FIG. **6**. The detents **117** and **118** are both laterally spaced and longitudinally spaced with respect to each other so that, in cooperation with the teeth **106**, incremental advance of the slide **75** can be accomplished.

The slide **75** is normally biased forwardly in the direction toward the machine by means of a pair of springs **122** and **124**.

The line spacing escapement mechanism operates by oscillation of the bar **100** as follow. The spring **112** normally biases the handle **108** in a clockwise direction, as viewed in FIG. **6**. This would be counterclockwise as viewed by the operator. Detent **117** is biased into engagement with one of the teeth **106** (which, for convenience, will be designated as **106***a*, see FIG. **7***a*), and springs **122** and **124** bias the detent **117** into contact with the vertical rear surface of the tooth **106***a*. In order to move the slide member **75** forward, the handle **108** is rotated clockwise as viewed by the operator against the bias of spring **112**, and then released. The effect of this motion is shown in sequential steps in FIGS. **7***a*, **7***b* and **7***c*. In FIG. **7***a* the detent **117** is shown being biased into engagement with tooth **106***a*. When the handle **108** is rotated against the bias of spring **112**, the shaft **100** is rotated in the direction shown by the arrow in FIG. **7***b* to the position shown therein. During this movement, the detent **117** is disengaged from the rear surface of tooth **106***a*. When the disengagement takes place, the springs **122** and **124** move the slide **75** forward toward the embossing station. However, as the shaft **100** moves to disengage detent **117**, the detent **118** is aligned with the tooth **106***a* that the detent **117** has just disengaged. The axial spacing (i.e., along the axis of bar **100**) of the detents **117** and **118** is less than spacing of the teeth **106**. Hence, the bias of spring **122** and **124** will move the slide **75** until detent **118** engages the rear surface of tooth **106***a*. This will position the detent **117** in front (as measured axially along bar **100**) of tooth **106***a*, but rearwardly of the vertical surface of the next tooth **106***b*. Release of the handle **108** will cause the spring **112** to return the handle **108** to its original position rotating the shaft **100** oppositely as shown by the arrow in FIG. **7** *c* to the position shown therein. When this rotation takes place, the detent **118** is released from engagement with the tooth **106***a*. The springs **122** and **124** will move the slide **75** forwardly until the detent **117** strikes the rear face of tooth **106***b* which is an advance of one tooth. Hence, one complete oscillation of the bar **100** will advance the slide **75** one tooth. This tooth spacing is selected to be equal to the desired line spacing on the article A to be embossed.

To return the slide **75** rearwardly, the slide **75** is merely grasped and pulled. The angle formed by the front of teeth **106** and the bias mounting by spring **120** allows the detents **117** and **118** to override the teeth **106** during this rearward movement.

CHARACTER SPACING ESCAPEMENT MECHANISM

A second escapement mechanism is provided which is adapted to allow the platform **48** to move laterally incrementally for character spacing. The character spacing escapement mechanism will be described as it is adapted to move the platform **48** incrementally from left to right as viewed in FIG. **1**.

As can best be seen in FIGS. **4** and **5**, the second escapement includes a laterally extending rack **126** mounted in a pair of slots or openings **128** and **130** formed in the platform **48**. The ends of the rack **126** are retained in the openings **128** and **130** by means of cotter pins **132** and **134** which are removable so that the rack **126** can be removed and reversed for operation of the character spacing mechanism in the opposite direction. The rack **126** is provided with a series of teeth **136** which have vertical engagements surfaces on one side and angled override surfaces on the other side. These teeth **136** are operably associated with a set of pawls designated generally as **138**.

The pawls **138** include an upper pawl **140**, a middle pawl **142**, and lower pawl **144**. These pawls **140**, **142** and **144** are provided with central apertures (unnumbered) which pivotally mount them for independent pivotal movement on a post **146**. The post **146** is mounted on a tab **148** extending from the lower section **32** of the support frame **30**. A second tab **150** is also provided which is adapted to mount pawls **140**, **142** and **144** for opposite direction movement of the platform **48**. The upper pawl **140** is provided with an actuating projec-

tion 152, and the middle pawl 142 is provided with a similar actuating projection 154. The projection 154 extends farther laterally than the projection 152. Pawl 144 has a downwardly projecting pin 155. Each of the pawls 140, 142 and 144 has teeth engaging tips 156, 158 and 160 respectively. The pawls 140, 142 and 144 are independently selectively operable by a mechanism now to be described to move the teeth engaging tips 156, 158 and 160 into and out of engagement with the teeth 136 of the rack 126 to provide incremental movement.

A flat spring member 162 is mounted on the post 146. The spring 162 has three finger extensions 164, 166 and 168 which respectively abut against the pawls 140, 142 and 144, normally biasing the teeth engaging tips 156, 158 and 160 thereof into contact with the teeth 136 of the rack 126.

When the carriage mechanism 12 is in the machine, the pawls 140 and 142 are operable respectively by cams 169 and 170 carried by shaft 28 and rotatable therewith (See FIGS. 1 and 3). The cam 169 bears against projection 152 of pawl 140 and cam 170 bears against projection 154 of pawl 142. Each of the cams 169 and 170 is provided with a high portion which, when it comes in contact with its respective projection 152 or 154, will pivot the respective pawl 140 and 142 to move the teeth engaging tip 156 and 158 thereof out of engagement with the teeth 136. Each cam 169 and 170 also has a low portion which, when engaging the projection 152 and 154 on its respective pawl 140 and 142, will permit the spring finger 164 or 166 to bias the teeth engaging tip 156 and 158 of its respective pawl 140 and 142 into engagement with the teeth 136.

Referring to FIGURES 4, 5, 8 and 9, the pawl 142 is also operable by a slide member 172 which is slidably mounted on the lower section 32 of the support frame 30. Slide member 172 has an upwardly projecting post 174 arranged to abut the extension 154 of pawl 142. As can best be seen in FIG. 9, the slide member 172 is guided on the support frame 30 by a depending pin 176 extending through slot 178 formed in the lower section 32. A spring 180 is interposed between pin 176 and a pin 182 depending from the lower section 32 which spring 180 normally biases the slide member 172 forwardly to urge the post 174 out of engagement with the pawl 142, and hence allow engagement of tip 158 with rack teeth 136.

The lower pawl 144 is operable by a second slide member 184, slidably mounted on the lower section 32 of the frame 30. Again, as can best be seen in FIG. 9, the slide member 184 is guided by a pin 186 projecting through a slot 188 formed in the frame 30. A spring 190 is interposed between the pin 186 and a pin 192 depending from the lower section 32 of the frame 30. Spring 190 normally biases the end of the slide member 184 against a post 155 depending from the pawl 144. This normally urges the teeth engaging tip 160 of the lower pawl 144 out of engagement with the teeth 136, against the bias of spring finger 168.

Referring now to FIGS. 5 and 8, a generally U-shaped spacer bar 194 is provided to operate the slides 172 and 184. The spacer bar 194 is pivotally mounted on the rod 46 and has an upwardly extending arm 196 at one end thereof, provided with an operating handle 198. The spacer bar 194 is disposed to operate against an upwardly turned leg 200 of the slide member 172 and against an upwardly turned leg 202 of slide member 184. Pivotal movement of the bar 194 will cause the rearwardly sliding movement of both slide members 172 and 184 against the bias of the respective springs 180 and 190.

Still referring to FIGS. 5 and 8, a U-shaped tab bar 204 is also provided, but this operates the slide member 172 only. The tab bar 204 is pivotally mounted on the bar 46 and has an upwardly extending arm 206 having thereon a handle 208. In order to prevent the operation of the slide 184 by the tab bar 204, a slot 210 is formed therein. This allows pivotal movement of the bar 204 to operate against the upturned leg 200 of the slide member 172, but prevents it operating against the upturned leg 202 of the slide member 184.

Referring now to FIGURES 1, 3 and 5, a platform biasing spring 212 is provided which, by proper arrangement, is adapted to bias the platform 48 either to the left or to the right, depending on whether printing type or human readable type embossments are to be performed. As shown, the spring 212 is arranged to move the platform 48 to the left as viewed in FIG. 5 which is from the operators right to left in FIG. 1. One end of the spring 212 is secured to a pin 214 which is carried by a stanchion 216, extending upwardly from the lower section 32 of the frame 30. The spring 212 is then reeved around a roller 218, mounted on a pin 220 on a second stanchion 222 at the opposite end of the lower section 32. The opposite end of this spring 212 is then secured to the platform 48.

The operation of the escapement mechanism for the line spacing with the carriage mechanism 12 in the machine is as follows, and can be followed in the diagrammatic representation of FIGURES 10*a*, 10*b* and 10*c*. In these figures, the normal bias direction of the pawls 140 and 142 and platform carrying the rack 126 is shown by arrows.

The slide member 184 is biased to the position where it maintains the tip of the pawl 144 out of engagement with the teeth 136. The cam 169 is positioned with its high spot against the projection 152 of the pawl 140, thus holding the tip 156 thereof out of engagement with the teeth 136. The cam 170 is positioned with its low portion adjacent the projection 154 on the middle pawl 142, thus allowing the tip 158 thereof to be biased into engagement with the teeth 136 by means of the finger 166 of spring 162. The platform biasing spring 212 normally urges the carriage mechanism 12 to the left as viewed in FIG. 5 which urges the vertical portion of one of the teeth 136*a* into engagement with the teeth engaging tip 158 of the middle pawl 142. This condition is represented diagrammatically in FIG. 10*a*. (In FIGS. 10*a*, 10*b* and 10*c*, the pawl 144 is maintained out of engagement with the teeth 136 at all times so this pawl 144 is not shown). The engagement of the pawl 144 with the teeth 136 prevents movement of the carriage mechanism 12.

When an embossment is made, the shaft 28 is either rotated one full revolution or oscillated from and returned to the "at-rest" position. When this rotation or oscillation takes place, the cams 169 and 170 also rotate or oscillate. The cams 169 and 170 are so arranged that, first the low spot of the cam 169 encounters the projection 152 on the upper pawl 140, which then permits the finger 164 of spring 162 to bias the tip 156 thereof into contact with the teeth 136. The lateral spacing of the teeth engaging tips 156 and 158 is less than the distance between the teeth 136 so that the teeth 136 engaging tip 156 falls into the groove between the teeth which is occupied by the tip 158 of the middle pawl 142. The continued rotation of shaft 28 will next move the high portion of the cam 170 into contact with the projection 154 on middle pawl 142, which will cause it to pivot the teeth engaging tip 158 thereof out of engagement with the teeth 136. The bias of the spring 212 will then cause the platform 48 to slide to the left as viewed in FIG. 10*a*, until the flat edge of tooth 136*a* comes in contact with the teeth engaging portion 156 of the upper pawl 140. This position is shown in FIG. 10*b*. This completes the half cycle movement, and the second half cycle is accomplished by the continued rotation of the shaft 28, or by reverse oscillation back to its original position. Continued rotation or oscillation back to the original position of this shaft 28 will then cause the low spot on cam 170 to come into contact with projection 154 of the middle pawl 142. The urging of spring finger 164 against the pawl 142 will cause it to pivot, moving the teeth engaging tip 158 thereof into the groove between tooth 136*a* and the next successive tooth 136*b*. Continued rotation or oscillation will then move the high portion of the cam 169 into contact with projection 152 on the top pawl 140, moving it against the bias of spring finger 164 out of contact with the flat face of tooth 136*a*. The spring 212 will then urge the platform 48 to the left as seen in FIG. 10*b* until the teeth engaging tip 158 of the middle pawl 142 comes in contact with the flat surface of the tooth 136*b*. This position is shown in FIG. 10*c*. Although not bearing directly upon the teaching of construction of the

preferred embodiment, it should be noted that the described two steps of spacing are not accomplished in one sequence of movement. After an embossment, as cam **26** is rotated to release position, the carriage mechanism **12** is advanced one-half of an increment by the engagement of tip **156** and withdrawal of tip **158**. This condition prevails until the next embossure is ready. Then as the shaft **28** is rotated to produce the next pressure cycle, the position of the tips **156** and **158** are reversed to complete the spacing prior to actual pressure contact of the disc members **14** and **16**.

The embossment operation has thus taken one complete cycle, and during this cycle the platform **48** has been advanced the distance of one tooth spacing, and the machine is in position to commence the next embossment. Hence, each time an embossment operation is performed, the platform **48** is advanced one space readying it for the next character impression.

In order to provide for spacings without the embossment operation taking place, the handle **198** of the spacer bar **194** is pushed forward and released. When this happens, the spacer bar **194** pushes both the slide members **172** and **184** rearwardly against the bias of their respective springs **180** and **190** (See FIG. **9**). This rearward movement during the initial pushing first moves the end of slide member **184** out of contact with the pin **155** depending from pawl **144** which allows the finger **168** of the spring **162** to push the teeth engaging tip **160** of the lower pawl **144** into engagement with the teeth **136**. The tip **160** of pawl **144** is substantially vertical in alignment with the tip **156** of pawl **140**. Hence, the operation of the pawl **144** is similar in function to the operation of pawl **140** during character spacing. Therefore, the functional operation of the pawl **144** can be followed on the diagrammatic drawings shown in FIGS. **10***a*, **10***b* and **10***c* by following the operation of pawl **140**, it being understood that the operation is not caused by the cams **169** and **170** but by the slides **172** and **184**. To make this easier to follow, the corresponding reference characters to pawl **140** are noted in parenthesis.

The teeth engaging tip **160** (**156**) of the pawl **144** (**140**) is slightly laterally offset respective to the teeth engaging tip **158** of the middle pawl **142**, but a distance less than one tooth spacing.

The rearward movement of the slide member **172** causes the post **174** thereon to strike the middle pawl **142** causing it to pivot to move the teeth engaging tip **158** thereof out of engagement with the teeth **136**. Hence, when the middle pawl **142** is pivoted to move the teeth engaging tip **156** thereof out of engagement with the teeth **136**, the bias of the spring **212** will cause the platform **48** to slide to the left until the vertical front surface of the tooth **136***a*, which had been engaged by the tooth engaging tip **158** of the middle pawl **142**, comes in contact with the teeth engaging tip **160** (**156**) of the lower pawl **144** (**140**).

When the handle **198** is released, the springs **180** and **190** will cause the slide member **172** and **184** to slide forwardly. This forward sliding of the slide member **172** will move the post **174** thereof out of contact with the pawl **142**. This then allows the finger **166** of the spring **162** to pivot the teeth engaging tip **158** of the middle pawl **142** into engagement with the teeth **136**. This engagement will be between the tooth **136***a* and the next successive tooth **136***b*.

The movement of the slide member **184** forwardly will cause it to strike post **155**, depending from the bottom pawl **144**, and push it against the bias of the finger **168** of the spring **162** out of contact with the teeth **136**. This will move the teeth engaging tip **160** (**156**) thereof out of contact with the surface of teeth **136***a*. The bias of spring **212** will then cause the flat surface of teeth **136***b* to come against the tip **158**.

Hence, movement of the space bar **194** forward and back will cause an incremental advancement of the platform **48** a distance equal to the distance between two teeth. Thus, a space can be provided between letters without performing an embossing operation.

The tab bar **204** can be actuated to release the escapement mechanism and allow the platform **48** to be moved to the fullest extent and not incremental. When the handle **208** is pressed, it operates only the slide member **172**, and it will not actuate the slide member **184**, since the slot **210** prevents the tab bar **204** from striking the leg **202** on the slide **184**. The movement of the slide member **172** rearwardly, as described above, will cause the middle pawl **142** to pivot its teeth engaging tip **158** out of engagement with the teeth **136**. Since the upper pawl **140** is maintained with its teeth engaging tip **156** out of engagement with the teeth **136** by means of the cam **169**, and since the lower pawl **144** is maintained with its teeth engaging tip **160** out of engagement with the teeth **136** by the slide member **184**, the release of the teeth engaging tip **158** from the teeth **136** will result in all pawls **140**, **142** and **144** being out of contact with the teeth **136** and thus allow the spring **212** to move the platform **48** freely and not incrementally.

In order to provide for margin settings, a pair of generally C-shaped clamp members **226** and **228** are provided which are mounted on the rod **44** on opposite sides of the platform **48** (FIGS. **1** and **4**). The clamps **226** and **228** are provided with release screws **230** and **232** respectively. These clamps **226** and **228** will set the limit of travel of the platform **48** in both directions. Hence, a left margin and a right margin can be set by merely releasing the screws **230** and **232**, moving the clamps **226** and **228** to the desired setting, and tightening the screws **230** and **232** again.

Once the end of the line has been reached, the platform **48** is returned to its starting position by pushing handle **108** in a direction against the bias of spring **112**. Since the teeth **136** have angled surfaces, the platform **48** can move back with the pawls **140**, **142** and **144** over-riding the teeth **136**. Also, the pushing and releasing of the handle **108** will cause the line escapement mechanism to advance the article A one line further into the machine as described above.

REVERSAL OF CHARACTER SPACING DIRECTION

As was indicated above, it is sometimes desirable to have the platform **48** move from left to right rather than from right to left (as seen in FIG. **5**). To accomplish this, a few of the parts are reversed, and one set of parts is replaced. This reversal and replacement can be quite simple accomplished. The reversed and modified parts are shown somewhat schematically in FIG. **11**. In this figure, the roller **218** is mounted on the pin **214** of stanchion **216**. The end of the spring **212** is secured to the pin **220** and reeved around the roller **218** and secured to the other end of the platform **48**. The rack **126** has been turned end-for-end so that the straight surfaces of the teeth **136** are directed to the right and the inclined surfaces to the left. A set of pawls **138'** is provided which includes three pawls **140'**, **142'** and **144'**, which are in all respects mirror images of the pawls **140**, **142** and **144**. The set of pawls **138'** is mounted on post **146** secured in the tab **150**. The spring **162** has been turned over and is the same spring as is utilized for the other direction of operation.

The slide members **172** and **184** have been moved to the opposite side of the bottom section **32** of the support frame **30**. The pins **176** and **186** depend through slots **178'** and **188'** (FIG. **4**) respectively, and the springs **180** and **190** are connected between their respective pins **176** and **186** and depending pins not shown, but which correspond to pins **182** and **192** respectively. The cams **169** and **170** have been moved on the shaft **28** to the proper alignment with the set of pawls **138'**. The spring **112** is moved from part **114** to **116**, and the device is then ready for operation in the opposite direction.

What is claimed is:

1. In an embossing machine including an embossing mechanism for forming embossed characters on a flat article, an improved carriage structure comprising, means mounting said carriage structure on said machine, said carriage structure including article positioning means to mount an article in

a given plane for embossments to be performed thereon, first track means mounting said article positioning means for reciprocal movement to move said article on a first path coplanar with said given plane, second track means mounting said article positioning means for movement toward and away from an initial position to move said article on a second path coplanar with said given plane and normal to said first path, first escapement means disposed to selectively effect incremental movement of said article positioning means in one direction along said first path and allow return movement in the opposite direction, said first escapement means including a shaft, means mounting said shaft for oscillation about its longitudinal axis, said shaft having teeth formed thereon, detent means carried by said article positioning means operably associated with said teeth, said detent means being positioned to engage and disengage said teeth upon oscillation of said shaft about its longitudinal axis, second escapement means disposed to selectively effect incremental movement of said article positioning means along said second path in a direction away from said initial position and to enable return movement of said article positioning means in the opposite direction toward said initial position, said second escapement means including means actuatable by said embossing mechanism to move said article positioning means an increment along said second path in a direction away from said initial position upon each actuation of said second escapement means, manually operable actuator means for returning said article positioning means along said second path in the direction toward said initial position and for contemporaneously therewith operating said first escapement means to move said article positioning means through an incremental distance along said first path, said actuator means including a single manually engageable member, means connecting said single manually engageable member with said article positioning means for transmitting translational movement from said single manually engageable member to said article positioning means to effect movement of said article positioning means along said second path in a direction toward said initial position, and means connecting said single manually engageable member with said shaft for transmitting rotational movement from said single manually engageable member to said shaft to effect rotation of said shaft about its longitudinal axis and operation of said first escapement means contemporaneously with movement of said article positioning means along said second path.

2. The invention as defined in claim 1, wherein said detent means includes first and second detents, said detents being laterally and longitudinally spaced with respect to each other, said longitudinal spacing being less than the spacing of the teeth on said shaft, said lateral spacing of said first and second detents being such that said teeth on said shaft are moved between a position engaging said first detent and a position engaging said second detent upon oscillation of said shaft about its longitudinal axis.

3. The invention as defined in claim 2, wherein said teeth have straight rear surfaces and sloping front surfaces, and wherein said detent means are yieldingly mounted to override the sloped surface, thereby allowing the detents to override the teeth for return movement.

4. The invention as defined in claim 1 further characterized by said second escapement means including rack means, biasing means normally urging said article positioning means in one direction on said second path, means to selectively position said biasing means for urging said article positioning means in either direction, and means mounting said rack means to enable operation of said article positioning means in either direction.

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