

May 11, 1937.

W. A. PRINGLE ET AL

2,080,061

STRIP TENSIONING AND THREADING DEVICE FOR WRITING MACHINES

Filed May 10, 1935

2 Sheets-Sheet 1

Fig. 1.

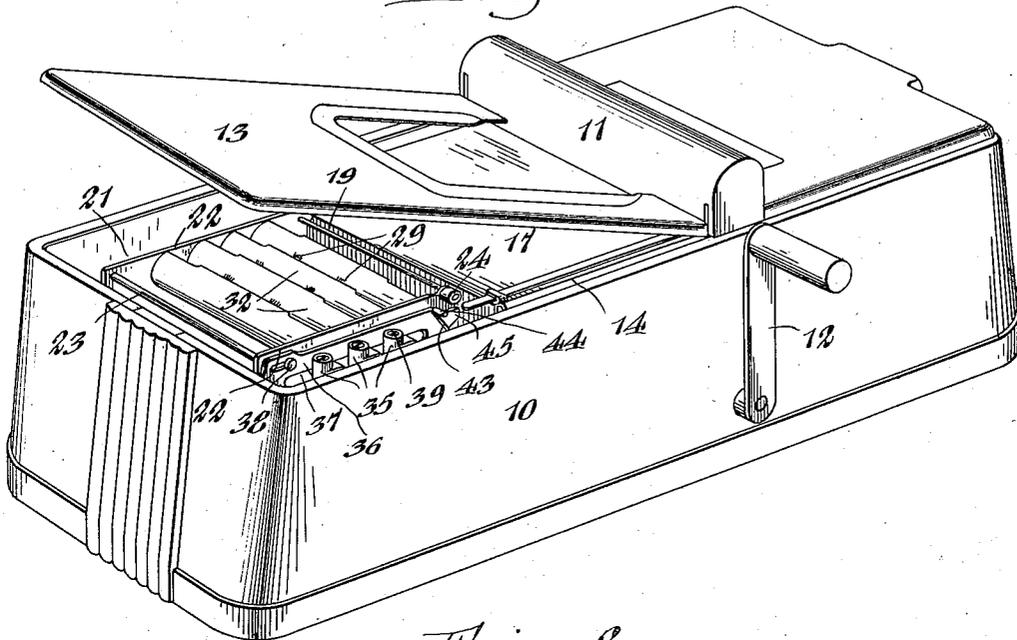


Fig. 2.

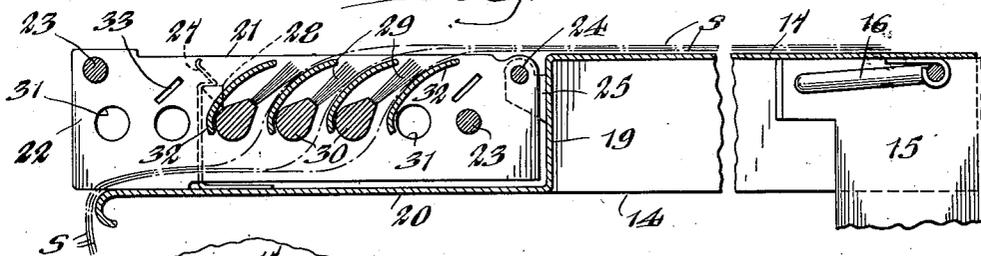


Fig. 6.

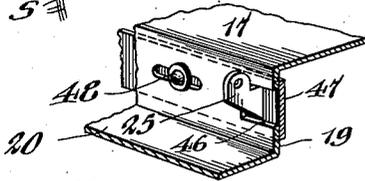
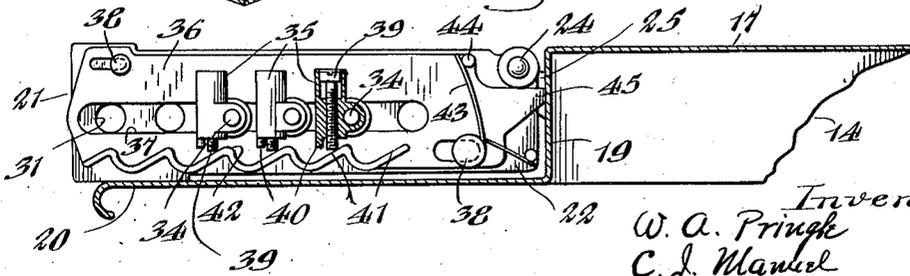


Fig. 3.



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2 Sheets-Sheet 2

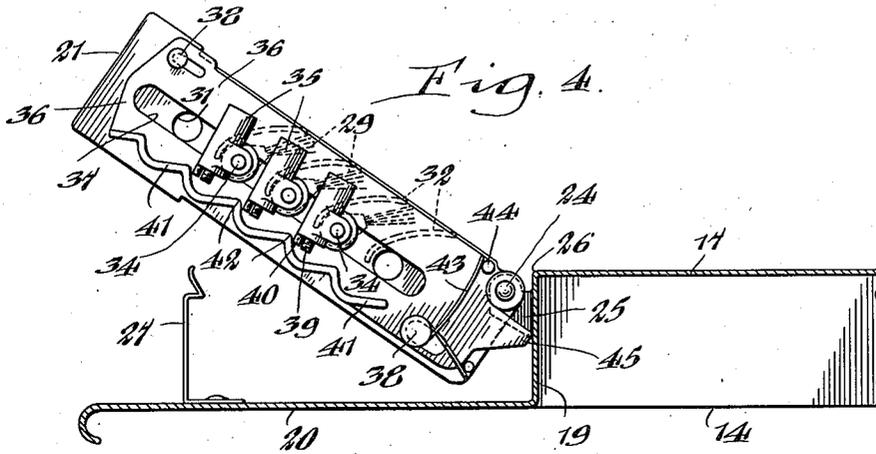
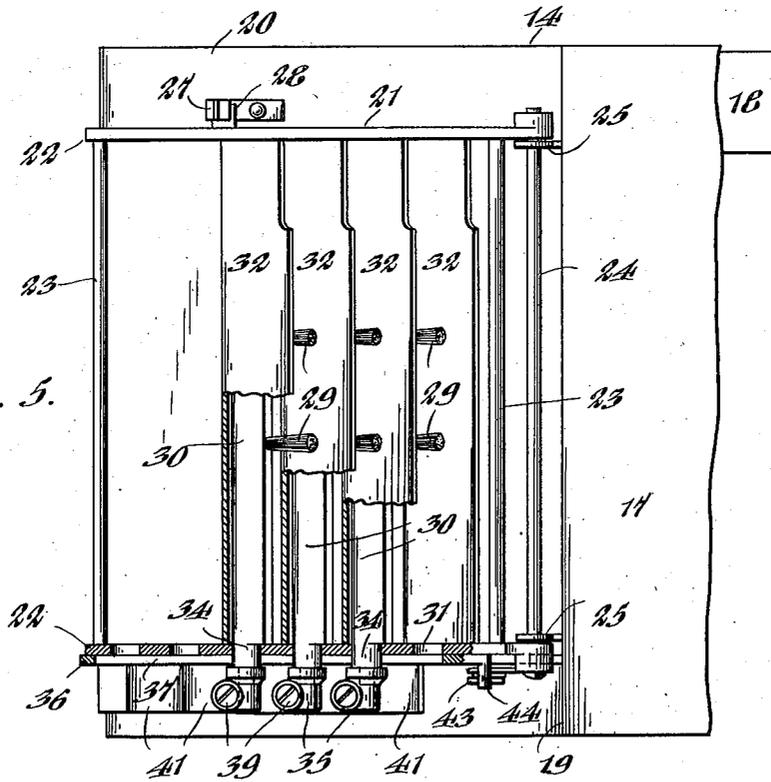


Fig. 5.



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UNITED STATES PATENT OFFICE

2,080,061

STRIP TENSIONING AND THREADING DEVICE FOR WRITING MACHINES

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19 Claims. (Cl. 282—12)

This invention relates to improvements in writing machines, such, for example, as autographic registers in connection with which it is herein disclosed, the improvements relating more particularly to tensioning and smoothing the record strips as they are fed forwardly in the machine, assuring that they shall lie in flat, smooth condition over the writing platen, and maintaining them free from bulges, wrinkles and other irregularities, so that clear and legible inscriptions may be made both upon the original record strip and upon the copy or duplicate strips.

It is a general object of the invention to provide, in machines of the class mentioned, an improved strip tensioning and smoothing device functioning not only to maintain the strips in correct position for inscription, but being also capable of positioning for convenient access in threading the strips into operative position, whereby time and trouble are saved.

Another object is to provide a strip controlling device having an improved mechanism for releasing the controlling pressure upon the strips and for automatically opening the controlling device by movement of the controlling unit into strip threading position, thus enabling the strips to be very quickly and easily inserted into operative position.

Still another object of the invention is to provide an improved mounting for the strip controlling unit, whereby said unit is very easily movable from its normal operative position into strip threading position, wherein it is conveniently accessible so as to facilitate the strip threading operation, means being provided for maintaining the control unit in its exposed position during the threading operation.

Another object of the invention is to provide an improved adjusting mechanism whereby the frictional controlling effect upon the strips may be individually adjusted.

Other objects of the invention will be in part pointed out in the following detailed description of an illustrative but preferred embodiment of the invention, and will be in part obvious in connection therewith.

The invention accordingly comprises the features of construction, combinations of elements and arrangement of parts which will be exemplified in the construction hereinafter set forth, and the scope of the application of which will be indicated in the claims.

For a complete disclosure of the illustrative embodiment of the invention, reference is had to the following detailed description and to the accompanying drawings, in which:

Fig. 1 is a perspective view of a writing machine of the autographic register type, constructed in accordance with the invention;

Fig. 2 is an enlarged, longitudinal, vertical sec-

tion through the writing platen unit of the machine showing the record strip controlling unit mounted thereon;

Fig. 3 is a view similar to Fig. 2, but showing the record strip controlling unit in elevation with parts thereof in section;

Fig. 4 is a view similar to Fig. 3 showing the strip controlling unit in partially raised position with the strip controlling elements opened for permitting the record strips to be threaded into position in the control unit;

Fig. 5 is a plan view of the structure shown in Fig. 2, parts being in horizontal section; and

Fig. 6 is a fragmentary detail perspective view showing the mounting of the strip control unit upon the platen unit.

In the illustrative embodiment of the invention herein disclosed, the improvements are installed in an autographic register of the type disclosed in the Hagemann Patent No. 1,827,745, issued October 20, 1931. This machine is provided with a casing 10 within which record strip feeding mechanism is mounted. This feeding mechanism may be of the general type disclosed in the Hagemann patent mentioned, wherein a feed roll is mounted in the feed roll housing 11, and the feeding mechanism is operated to feed the record strips by means of a feeding lever 12. The machine is provided with an interior compartment for housing the record strip supply which is preferably in the form of a zigzag folded pack, in which the record strips S are folded in a compact form convenient for handling. A cover or margin frame 13 is attached to the machine, as by pivoting it to the roll housing 11, whereby it may be raised so as to permit access to the interior of the machine, or closed to overlie the upper edges of the casing.

Immediately beneath the cover 13 is the platen unit 14, supported in position substantially flush with the upper edges of the casing walls and mounted upon the frame 15 for the feeding mechanism by means of supporting links 16. By means of this mounting, the platen unit 14 can be swung or moved upwardly from its normal operative position shown in Fig. 1, into position for convenient access. By virtue of the supporting link 16, the platen unit can be translated rearwardly, whereby it may rest upon the upper edge of the rear end wall of the casing, so as to hold it in exposed position for manipulating the strips, as will be fully described below.

As herein shown, the platen unit 14 includes a platen plate 17 upon which the record strips rest beneath the margin frame for receiving the inscriptions which may be inserted manually through the opening in the margin frame. Carbon or transfer strips may be led from the carbon supply 18 over the platen and interleaved in transfer relation between the record strips.

An upright wall 19 extends downwardly from the rear edge of the platen 17 and extending rearwardly from the lower edge of this wall is a floor plate 20. The wall 19 and plate 20 provide a space or compartment on the platen unit wherein the record strip smoothing and controlling unit 21 is positioned.

This controlling unit 21 comprises side frame members 22 and cross frame members or tie rods 23. This frame is pivotally mounted at 24 on brackets 25 connected to the upright wall 19 whereby the controlling unit frame can be swung upwardly on its pivotal mounting as shown in Fig. 4, or it may be swung upwardly still further until its center of gravity passes beyond the pivotal point, in which position it is supported against the corner 26 of the platen unit. In its lowered or normal operative position, the controlling unit rests upon the floor 20 of the compartment and is held in this position by means of a spring catch 27 attached to the floor 20 and engaging a latch lug 28 upon the unit.

Mounted upon the frame of the controlling unit 21 are record strip controlling elements 29 carried by supporting bars 30 rotatably mounted in bearing apertures 31 of the side frame members. There may be as many of these record strip controlling elements as desired to exert an individual strip tensioning and smoothing effect upon each of the record strips S, each element 29 cooperating with a guide 32 over which each record strip individually passes. The strip controlling elements 29 are in the form of bundle arms of bristles or the like which yieldingly and resiliently engage the surfaces of the record strips as they pass over the guide bars or plates 32. Since control elements of this general type are fully described in the Hagemann Patent 1,804,608, dated May 12, 1931, it is deemed unnecessary to describe them in detail here. Each of the guide plates 32 may, as shown, be mounted and supported by the side plates 22 which, for this purpose, are formed with elongated, inclined openings 33 in which end extensions on each guide plate are positioned. This arrangement not only supports the guide plates but maintains them in the desired inclined position as shown in Fig. 2. Furthermore, this structure provides for convenient assembly or disassembly of the strip controlling unit.

Each supporting bar 30 of the strip controlling elements is formed at one of its ends with an operating extension 34 passing through the aperture in the adjacent side frame member 22, and a crank arm 35 is attached to each operating extension lying just outside of the side plate 22. An actuator plate 36 is mounted at the outer surface of the adjacent side frame member 22 lying between the latter and the crank arms or actuating elements 35 being provided with a longitudinal slot 37 extending along its length in which the operating extensions 34 run. This actuator plate 36 is slidably mounted upon the plate 22 by means of pin and slot connections 38 providing for longitudinal reciprocating sliding movement of the actuator plate, with reference to the frame of the controlling unit.

Each actuator crank arm 35 is formed with a threaded recess in which a screw 39 is mounted. The head of this screw is seated in a recess in the upper end of the crank arm in which it is housed and protected, while a coiled retaining spring may be compressed in the recess beneath the head to hold the screw in adjusted position.

The lower end of the screw extends through the lower end of the crank arm so as to contact in operative relation with an actuator element. Just forwardly of each screw, each crank arm has an operating lug or extension 40.

Integrally or otherwise attached to the lower marginal portion of the actuator plate 36 are a plurality of actuator or cam elements 41. These cam elements are inclined to the longitudinal axis of the actuator plate 36 and are positioned respectively adjacent to the ends of the actuator screws 39 which contact therewith for effecting rotary movement of the controlling elements 29. Adjacent one end of each of the cam plates is an operating shoulder 42 positioned for contacting with the extension 40 of the adjacent crank arm.

A spring 43 engages a lug 44 upon the actuator plate 36 being stressed to urge said plate rearwardly, that is, to the right in Figs. 3 and 4. The actuator plate is also formed with an operating extension 45 positioned adjacent to the upright wall 19 and adapted to contact with the latter.

In order to provide for adjustment of the strip controlling unit laterally of the strip path, it is preferred that the supporting brackets 25 be adjustably attached to the wall 19, such, for example, as shown in Fig. 6. As shown, the wall 19 is formed with openings 46 through which the supporting brackets 25 project from the rear. The brackets 25 are connected together at the rear of the wall 19 by means of a connecting plate 47 preferably integral with the brackets. The connecting plate 47 is connected at the rear of the wall 19 for sliding movement laterally of the strip path by means of screw and slot connections 48. By means of this structure the screws of the connections 48 may be readily loosened and the supporting brackets adjusted laterally of the strip path into the desired operative position, whereupon the screws can then be tightened.

In operation the record strippers pass from a supply compartment in the machine casing over a rounded guide at the end of the platen unit into the strip controlling unit. When the strips are to be threaded into position, the platen unit 14 may be raised into exposed position slightly above the walls of the casing and supported in this position by the rear end of the casing wall as above described. Upon release of the spring latch 27, the strip controlling unit 21 is then swung upwardly upon its pivot 21 being supported in its raised position by engagement with the stop lug 26. When the controlling unit is being raised, the operating extension 45 of the actuator plate 36 is swung away from the wall 19, whereupon the spring 43 becomes effective to slide the actuator plate rearwardly. After some movement of the plate 36, the operating shoulders 42 respectively engage with the extensions 40 of the crank arms 35, thus causing rearward rotation of each of the strip controlling elements 29 away from its normal strip engaging position. In the position shown in Fig. 4, the strip engaging grips between the respective control elements and the guide plates 32 are thus opened to provide wide gaps providing for free insertion of each of the record strips into individually controlled position. When each of the record strips has thus been threaded into position, the control unit 21 may then be swung downwardly into its normal operative position and during such movement the operating extension 45 contacts with the wall 19, thus moving the ac-

tuator plate 36 against the tension of spring 43 to the left, as viewed in Fig. 4. During this movement, the cam plates 41 respectively engage with the adjustable actuator screws 39 of the crank arms so as to rotate the strip controlling elements 29 forwardly into closed positions in which they engage and yieldingly grip the strips to exert frictional tensioning and smoothing effect thereon. The spring catch 27 engages the lug 28 to hold the unit in operative position. The platen unit may then be adjusted into its normal operative position within the casing. It will be understood that forward feeding movement of the record strips through the control unit will function to tension and smooth the strips over the writing platen in a manner as fully described in the Hagemann Patent No. 1,804,608. The tensioning and controlling effect upon the advancing strip may be individually adjusted by means of the adjusting screws 39. It will be noticed that the threading of the strips into controlled position in the controlling unit is greatly facilitated both by the placing of the control unit into readily accessible position and by the opening of the grips upon the strips by the rotation of the controlling elements.

Since certain changes may be made in the above construction and different embodiments of the invention could be made without departing from the scope thereof, it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

Having described our invention, what we claim as new and desire to secure by Letters Patent is:

1. In an apparatus of the character described, in combination, a platen unit mounted upon the apparatus for movement to and from exposed position and a strip-tensioning and controlling unit mounted upon said platen unit for swinging movement away from normal operative position thereon into another position in which it is disposed at an angle to the plane of the platen unit for convenient access for threading the strips therein.

2. In an apparatus of the character described, in combination, a platen unit mounted upon the apparatus for movement to and from exposed position, a strip tensioning and controlling unit movably mounted upon said platen unit for movement from normal operative position thereon into another position for convenient access for threading the strips therein, said strip controlling unit having one or more strip engaging, strip controlling elements mounted for movement into strip engaging position or into open position for threading the strips, and means for automatically moving said strip controlling element into its open position by movement of said controlling unit into its threading position.

3. In an apparatus of the character described, in combination, a platen unit mounted upon the apparatus for movement to and from exposed position, a strip tensioning and controlling unit movably mounted upon said platen unit for movement from normal operative position thereon into another position for convenient access for threading the strips therein, said strip controlling unit having a plurality of strip engaging, strip controlling elements, each mounted for movement into strip engaging position or into open position for threading the strips, an actuator plate movably mounted on said strip controlling unit, an actuating member for each of said strip controlling elements carried by said actuator plate and coop-

erating individually with the respective strip controlling elements for operating the latter upon movement of said plate, and means for moving said actuator plate when said control unit is moved into its normal operative position thus to operate said controlling elements into their strip controlling positions.

4. In an apparatus of the character described, in combination, a platen unit mounted upon the apparatus for movement to and from exposed position, a strip tensioning and controlling unit movably mounted upon said platen unit for movement from normal operative position thereon into another position for convenient access for threading the strips therein, said strip controlling unit having a plurality of strip engaging, strip controlling elements, each mounted for movement into strip engaging position or into open position for threading the strips, an actuator plate movably mounted on said strip controlling unit, an actuating member for each of said strip controlling elements carried by said actuator plate and cooperating individually with the respective strip controlling elements for operating the latter upon movement of said plate, means for moving said actuator plate when said control unit is moved into its normal operative position thus to operate said controlling elements into their strip controlling positions, and adjusting means between each actuating member and the respective controlling element for individually adjusting the strip controlling effect of the latter.

5. In an apparatus of the character described, in combination, a platen unit mounted upon the apparatus for movement to and from exposed position, a strip tensioning and controlling unit movably mounted upon said platen unit for movement from normal operative position thereon into another position for convenient access for threading the strips therein, said strip controlling unit having a plurality of strip engaging, strip controlling elements, each mounted for movement into strip engaging position or into open position for threading the strips, an actuator plate movably mounted on said strip controlling unit, an actuating member for each of said strip controlling elements carried by said actuator plate and cooperating individually with the respective strip controlling elements for operating the latter upon movement of said plate, means for moving said actuator plate when said control unit is moved into its normal operative position thus to operate said controlling elements into their strip controlling positions, means for moving said actuator plate in the opposite direction when said controlling unit is moved away from its normal strip controlling position into strip threading position, and actuating members carried by said actuator plate and cooperating respectively with the strip controlling elements to open the latter when said controlling unit is moved into its strip threading position.

6. In an apparatus of the character described, in combination, a platen unit mounted upon the apparatus for movement to and from exposed position, a strip tensioning and controlling unit movably mounted upon said platen unit for movement from normal operative position thereon into another position for convenient access for threading the strips therein, said strip controlling unit having a plurality of strip engaging, strip controlling elements, each mounted for movement into strip engaging position or into open position for threading the strips, an actuator plate movably mounted on said strip controlling unit, an

actuating member for each of said strip controlling elements carried by said actuator plate and cooperating individually with the respective strip controlling elements for operating the latter upon movement of said plate, means for moving said actuator plate when said control unit is moved into its normal operative position thus to operate said controlling elements into their strip controlling positions, means for moving said actuator plate in the opposite direction when said controlling unit is moved away from its normal strip controlling position into strip threading position, and actuating members carried by said actuator plate and cooperating respectively with the strip controlling elements to open the latter when said controlling unit is moved into its strip threading position, and adjusting means between each actuating member and the respective controlling element for individually adjusting the strip-controlling effect of the latter.

7. In an apparatus of the character described, in combination, a platen unit mounted upon the apparatus for movement to and from exposed position, a strip tensioning and controlling unit movably mounted upon said platen unit for movement from normal operative position thereon into another position for convenient access for threading the strips therein, said strip controlling unit having a plurality of strip engaging, strip controlling elements mounted for movement in strip engaging position or into open position for threading the strips, an actuator plate movably mounted on said strip controlling unit, a crank arm connected to each of said strip controlling elements, an actuator cam for each said crank arm mounted on said actuator plate and cooperating respectively with the cranks arms for operating the strip controlling elements, and means for moving said actuator plate when said control unit is moved into its normal operative position, thus to operate said controlling elements into strip controlling positions.

8. In an apparatus of the character described, in combination, a platen unit mounted upon the apparatus for movement to and from exposed position, a strip tensioning and controlling unit movably mounted upon said platen unit for movement from normal operative position thereon into another position for convenient access for threading the strips therein, said strip controlling unit having a plurality of strip engaging, strip controlling elements mounted for movement in strip engaging position or into open position for threading the strips, an actuator plate movably mounted on said strip controlling unit, a crank arm connected to each of said strip controlling elements, an actuator cam for each said crank arm mounted on said actuator plate and cooperating respectively with the crank arms for operating the strip controlling elements, means for moving said actuator platen when said control unit is moved into its normal operative position, thus to operate said controlling elements into strip controlling positions, and an adjusting screw mounted on each of said crank arms for individual adjustment of the strip controlling effect of the respective strip controlling elements.

9. In an apparatus of the character described, in combination, a platen unit mounted upon the apparatus for movement to and from exposed position, strip tensioning and controlling unit movably mounted upon said platen unit for movement from normal operative position thereon into another position for convenient access for threading the strips therein, said strip con-

trolling unit having a plurality of strip engaging, strip controlling elements mounted for movement in strip engaging position or into open position for threading the strips, an actuator plate movably mounted on said strip controlling unit, a crank arm connected to each of said strip controlling elements, an actuator cam for each said crank arm mounted on said actuator plate and cooperating respectively with the crank arms for operating the strip controlling elements, means for moving said actuator plate when said control unit is moved into its normal operative position, thus to operate said controlling elements into strip controlling positions, means for moving said actuator plate in the opposite direction when said control unit is moved away from its normal strip controlling position into strip threading position, and operating members on said actuator plate positioned respectively adjacent to said cams and cooperating with the respective crank arms to open said controlling elements when said controlling unit is moved into threading position.

10. In an apparatus of the character described, in combination, a casing, a platen unit movably mounted on the apparatus for movement into normal operative position within said casing and into accessible exposed position, said platen unit having a forwardly disposed writing platen and a rearwardly disposed support for a strip controlling unit, and a strip tensioning and controlling unit pivotally mounted on said support for upward swinging movement with reference to the platen unit.

11. In an apparatus of the character described, in combination, a casing, a platen unit movably mounted on the apparatus for movement into normal operative position within said casing and into accessible exposed position, said platen unit having a forwardly disposed writing platen and a rearwardly disposed support for a strip controlling unit, a strip tensioning and controlling unit pivotally mounted on said support for upward swinging movement with reference to the platen unit, and a support for the pivotal mounting of said control unit connected to said platen unit for lateral adjustment.

12. In an apparatus of the character described, in combination, a casing, a platen unit movably mounted on the apparatus for movement into normal operative position within said casing and into accessible exposed position, said platen unit having a forwardly disposed writing platen and a rearwardly disposed compartment having a bottom wall and an upright wall having an opening, a strip tensioning and controlling unit positioned in said compartment, a supporting bracket having a supporting element extending through the opening in said upright wall to which the controlling unit is pivoted for upward swinging movement with reference to the platen unit, and connecting means connecting said supporting bracket to said upright wall for adjustment transversely of the platen unit.

13. In an apparatus of the character described, in combination, a casing, a platen unit movably mounted on the apparatus for movement into normal operative position within said casing and into accessible exposed position, said platen unit having a forwardly disposed writing platen and a rearwardly disposed support for a strip controlling unit, a strip tensioning and controlling unit pivotally mounted on said support for upward swinging movement with reference to the platen unit, a plurality of strip controlling ele-

ments movably mounted on said controlling unit for movement into open and closed positions, an actuator plate movably mounted on said controlling unit, actuator elements mounted on said actuator plate and operatively connected to said controlling elements, and means for moving said actuator plate when said controlling unit is raised and lowered so as to open and close the strip controlling elements.

tuator arms upon movement of the actuator in the opposite direction to actuate said controlling elements into open strip threading position.

17. In an apparatus of the character described, in combination, a strip tensioning and controlling unit including a frame mounted upon the apparatus for movement between normal operative position and strip threading position, strip controlling elements mounted on said frame for movement into closed position wherein they exert frictional control on the advancing strips, or into open position to permit threading of the strips into operative position, a crank arm connected to each of said strip controlling elements, an actuator reciprocatingly mounted on said frame and having thereon a plurality of cam plates with cam surfaces inclined to the path of movement of the actuator, and cooperating respectively with the actuator arms for operation of the strip-controlling elements into closed position upon movement of the actuator in one direction, and means for reciprocating said actuator upon movements of said frame between its normal operative and strip threading positions.

18. In an apparatus of the character described, in combination, a strip tensioning and controlling unit including a frame mounted upon the apparatus for movement between normal operative position and strip threading position, strip controlling elements mounted on said frame for movement into closed position wherein they exert frictional control on the advancing strips, or into open position to permit threading of the strips into operative position, a crank arm connected to each of said strip controlling elements, an actuator reciprocatingly mounted on said frame and having thereon a plurality of cam plates with cam surfaces inclined to the path of movement of the actuator, and cooperating respectively with the actuator arms for operation of the strip controlling elements into closed position upon movement of the actuator in one direction, means for reciprocating said actuator upon movements of said frame between its normal operative and strip threading positions, and a shoulder mounted on said actuator adjacent to each of said cams and cooperating respectively with said crank arms upon movement of the actuator in an opposite direction to actuate said controlling elements into open strip threading position.

19. In an apparatus of the character described, in combination, a strip tensioning and controlling unit including a frame mounted upon the apparatus for movement between normal operative position and strip threading position, strip controlling elements mounted on said frame for movement into closed position wherein they exert frictional control on the advancing strips, or into open position to permit threading of the strips into operative position, a crank arm connected to each of said controlling elements which are rotatable in the frame, a reciprocating cam mounted adjacent to each of said crank arms for operating the latter upon movement of the cams in one direction, and an adjusting screw mounted in each of said arms and engaging the respective cam so as to vary the frictional controlling effect of said controlling element upon the advancing strip.

14. In an apparatus of the character described, in combination, a strip tensioning and controlling unit including a frame mounted upon the apparatus for movement between normal operative position and strip threading position, strip controlling elements mounted on said frame for movement into closed position wherein they exert frictional control on the advancing strips, or into open position to permit threading of the strips into operative position, an actuator arm connected to each of said strip controlling elements, an actuator reciprocatingly mounted on said frame and having a plurality of actuator elements cooperating respectively with said actuator arms for operating said controlling elements into closed position upon movement of the actuator in one direction, and means for reciprocating said actuator upon movements of said frame between its normal operative and strip threading positions.

15. In an apparatus of the character described, in combination, a strip tensioning and controlling unit including a frame mounted upon the apparatus for movement between normal operative position and strip threading position, strip controlling elements mounted on said frame for movement into closed position wherein they exert frictional control on the advancing strips, or into open position to permit threading of the strips into operative position, an actuator arm connected to each of said strip controlling elements, an actuator reciprocatingly mounted upon said frame and having a plurality of actuator elements cooperating respectively with said actuator arms for operating said controlling elements into closed position upon movement of the actuator in one direction, means for reciprocating said actuator upon movements of said frame between its normal operative and strip threading positions, and an adjusting device carried by each of said actuator arms for individually varying the frictional controlling effect of each of said strip controlling elements.

16. In an apparatus of the character described, in combination, a strip tensioning and controlling unit including a frame mounted upon the apparatus for movement between normal operative position and strip threading position, strip controlling elements mounted on said frame for movement into closed position wherein they exert frictional control on the advancing strips, or into open position to permit threading of the strips into operative position, an actuator arm connected to each of said strip controlling elements, an actuator reciprocatingly mounted upon said frame and having a plurality of actuator elements cooperating respectively with said actuator arms for operating said controlling elements into closed position upon movement of the actuator in one direction, means for reciprocating said actuator upon movements of said frame between its normal operative and strip threading positions, and operating elements carried by said actuator and cooperating respectively with said ac-

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