Sept. 18, 1956 B. F. MADSEN 2,763,357

REVERSIBLE PAGE FEED MECHANISM

Filed July 13, 1953 3 Sheets-Sheet 1

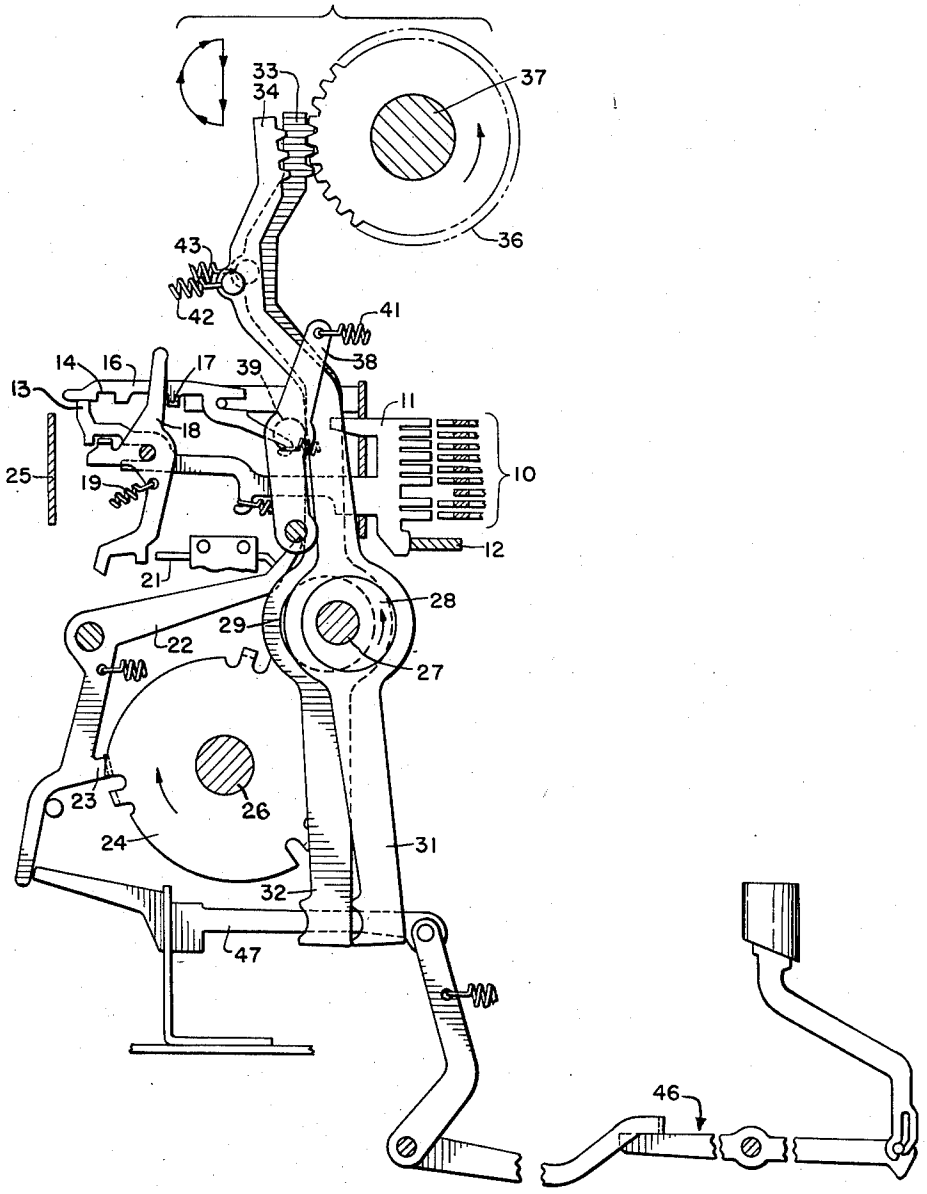


FIG. 1

INVENTOR
BERTHEL F. MADSEN
BY Emery Robinson
ATTORNEY

Sept. 18, 1956 B. F. MADSEN 2,763,357

REVERSIBLE PAGE FEED MECHANISM

Filed July 13, 1953 3 Sheets-Sheet 2

FIG. 2

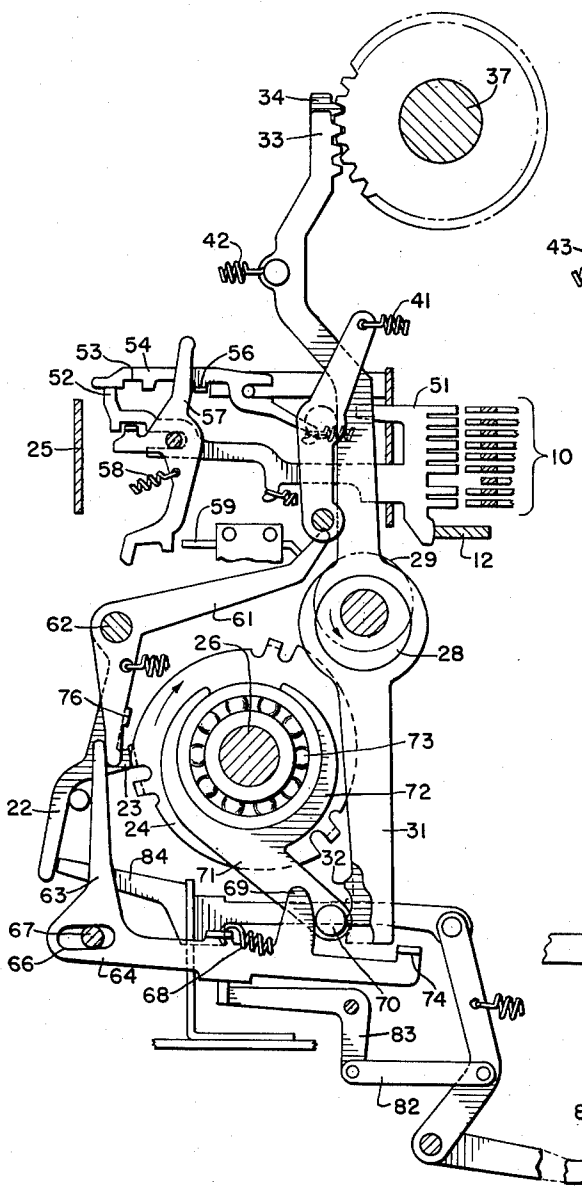
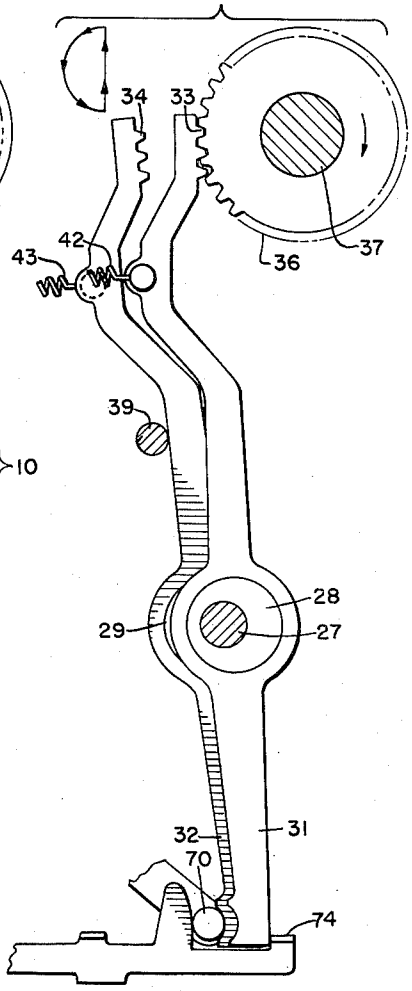


FIG. 3



INVENTOR
BERTHEL F. MADSEN
BY Emery Robinson
ATTORNEY

Sept. 18, 1956 B. F. MADSEN 2,763,357

REVERSIBLE PAGE FEED MECHANISM

Filed July 13, 1953 3 Sheets-Sheet 3

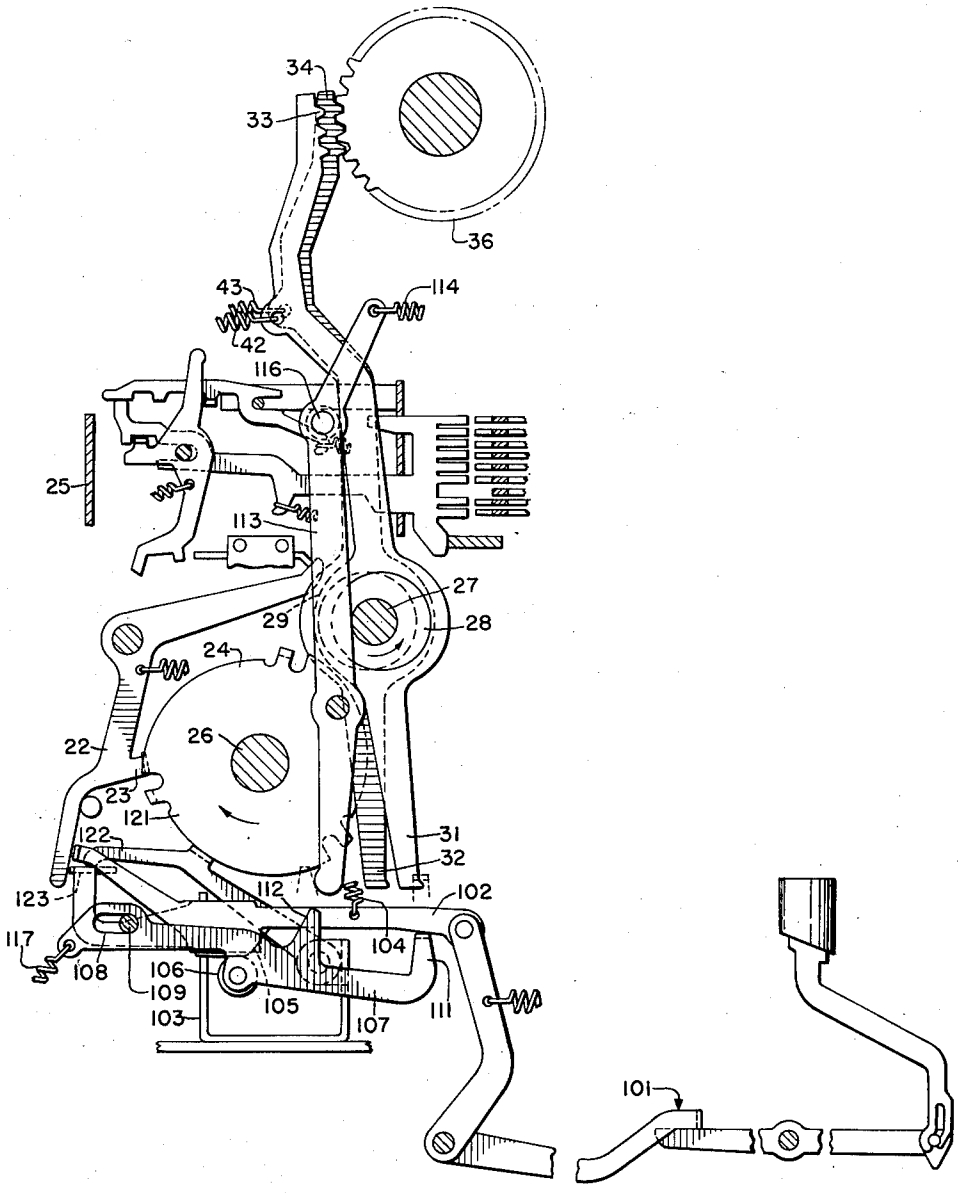


FIG. 4

INVENTOR
BERTHEL F. MADSEN
BY Emery Robinson
ATTORNEY

United States Patent Office 2,763,357 Patented Sept. 18, 1956

2,763,357

REVERSIBLE PAGE FEED MECHANISM

Berthel F. Madsen, Chicago, Ill., assignor to Teletype Corporation, Chicago, Ill., a corporation of Delaware

Application July 13, 1953, Serial No. 367,433

17 Claims. (Cl. 197—114)

This invention relates to reversible page feed mechanisms and more particularly to page feed mechanisms adapted to be incorporated in printing telegraph apparatus wherein it is desired to selectively advance a page in either a forward or reverse direction.

In operation of printing telegraph apparatus, situations often arise, particularly when printing on such mediums as preforms, coupons, tickets, etc., where it is necessary or desirable to insert or interlineate intelligence that was omitted from previously printed areas on the recording medium. Predicaments are also encountered in the operation of printing telegraph apparatus wherein it becomes imperative to correct errors in prior printed lines on a page, hence requiring a reverse feed operation of the platen carrying the page. Other occasions or reasons often occur or can be perceived where the exigency exists to effectuate one or more reverse line feed operations.

A primary object of the present invention resides in a page printing apparatus having facilities therein for effectuating the rapid forward or reverse line feed of a page.

Another object of the invention manifests itself in a pair of eccentric driven platen feed levers which are selectively adapted to pivot about either one or the other of a pair of pivot elements, thereby determining the direction of platen advance.

It is a further object of the invention to selectively reverse the engagement sequence of a pair of cyclically driven feed members to reverse the direction of advance of a platen.

Still another object of the invention resides in a line feed mechanism that may rapidly operate in either a forward or reverse direction without the incorporation of encumbering auxiliary mechanisms.

A complete description of the printing telegraph apparatus utilized in the present specification to illustrate the invention is contained in the patent to W. J. Zenner, No. 2,505,729, issued April 25, 1950, therefore, a complete description of the elemental parts and subassemblies of the printer which are not necessary for a complete understanding of the present invention is omitted for the purpose of simplifying the disclosure and hence making the present invention more readily understandable. It is to be comprehended however that the principles of the invention are not to be restricted to incorporation in an identical printer but may be advantageously adapted to inclusion in other types of printing telegraph or recording apparatus.

With these and other objects in view the present invention contemplates a printing telegraph apparatus having a rotatably mounted platen therein. Co-operating with the platen are a pair of feed racks which are cyclically driven out of phase with respect to each other through the agency of a pair of rotating eccentrics. Selectively operable pivot elements are provided to engage the feed racks to determine the type of motion imparted to said feed racks by the eccentrics.

In operation of the invention the selection of one of the pivot elements by means of either the operation of a key lever or by the reception of a permutative type telegraph signal causes the feed rack to advance the platen in a forward direction. In situations wherein it is desirable to reverse the direction of movement of the platen a special key lever is operated or a special permutative type signal is received to cause the selection of a second one of said pivot elements resulting in the eccentrics driving the racks in a reverse path of movement thereby imparting a reverse line feed motion to the platen.

A more complete understanding of the invention may be had by reference to the following description when considered in conjunction with the accompanying drawings wherein:

Fig. 1 is a side elevational view of a section of a printing telegraph apparatus showing a forward line feed mechanism;

Fig. 2 is a side elevational view of another section of the printing telegraph apparatus such as shown in Fig. 1, but in this instance illustrating a reverse line feed mechanism embodying features of the present invention;

Fig. 3 is a side elevational view of the reverse line feed mechanism disclosed in Fig. 2 and depicting one phase of a reverse line feed operation; and

Fig. 4 is a side elevational view of a printing telegraph apparatus disclosing an alternative mechanism for effecting forward and reverse line feed operations.

Referring to Figs. 1, 2 and 3, and more particularly to Fig. 1 there is disclosed therein a forward line feed mechanism which is adapted to be incorporated in the afore-identified patent to W. J. Zenner. This line feed mechanism is a modification of a line feed mechanism shown in the copending application of applicant Serial No. 210,910, filed February 14, 1951, now Patent No. 2,667,256. The disclosures of the Zenner patent and applicant's copending application are hereby incorporated by reference in the present application.

In Fig. 1 there is disclosed a plurality of code bars **10** (similar to the code bars 62 to 70, inclusive, shown in the Zenner patent) adapted to be permutatively positioned in accordance with an incoming start-stop Baudot type telegraph signal. As described in the Zenner patent a plurality of function bars are adapted to cooperate with the code bars. One of these function bars is disclosed in the drawing and is designated by the reference numeral **11**. Positioned beneath the function bar **11** is a bail **12** (similar to the bail 367 shown in the Zenner patent) which is adapted to be cyclically reciprocated to permit the function bars to probe the permutative positionment assumed by the code bars **10**. If a proper positionment of the code bars **10** has been assumed then the function bar **11** will move towards the right and a trailing projection **13** thereof will drop within a notch **14** formed in a function latch **16**. When the bail **12** returns to the position shown in Fig. 1 during the course of operation, the projection **13** will move the function latch **16** towards the left to move a laterally extending detent **17** formed thereon into engagement with an interponent **18**. The interponent **18** is pivotally mounted and consequently will be pivoted against the effect of a biasing spring **19** to move into engagement with a push rod **21**. Continued movement of the interponent **18** causes the push rod **21** to move and pivot a trip latch **22** to thus remove a stop element **23** formed thereon from engagement with a clutch **24**. An oscillating stripper plate **25** (similar to plate 384 in the afore-identified Zenner patent) is provided to restore the function latches to the initial position following performance of the desired functions.

When the clutch 24 is released, rotative movement is imparted from a shaft 26 through a gear (not shown) to a shaft 27. Shaft 26 is driven in a clockwise direction, consequently, the movement imparted to the shaft 27 is in a counterclockwise direction. Mounted on the shaft 27 is a pair of eccentrics 28 and 29 positioned within straps forming part of a pair of feed levers 31 and 32. The feed levers have formed on their upper extremities rack sections 33 and 34 adapted to co-operate with a gear 36 secured to a platen shaft 37. Attached to the platen shaft 37 is a platen (not shown) adapted to carry therewith the medium upon which intelligence is to be recorded. Positioned to the left of the feed levers is a pivotally mounted lever 38 having rotatably mounted at its midpoint a pivot roller 39 which is urged by a spring 41 into engagement with the shank portions of both of the feed levers 31 and 32. Each of the feed levers 31 and 32 is biased by springs 42 and 43, respectively, against the pivot roller 39, but the spring 41 is heavier than both the springs 42 and 43, consequently, the pivot element tends to move the rack sections 33 and 34 into engagement with the gear 36.

When the eccentric radius of the eccentric 29 extends towards the left as viewed in Fig. 1 then the pivot roller 39 engages the shank portion of the feed lever 32 to move the teeth of the rack section 33 into engagement with the teeth of the gear 36. The eccentric radius of the eccentric 28 extends towards the right, hence the spring 42 is effective to position the shank portion of feed lever 31 against the roller 39 and thereby withdraw the teeth of the rack section 34 from the teeth of the gear 36. As the eccentrics rotate, the rack sections 33 and 34 follow a path as illustrated by the dotted arrow figure shown to the left of the gear 36. As each eccentric moves so that its eccentric radius extends toward the left it will hold the pivot roller 39 against the effect of the spring 41 and as each eccentric radius assumes a position extending towards the right then the associated feed lever is allowed to pivot through the agency of its associated spring to withdraw the rack section formed thereon from engagement with the teeth of the gear 36. The net result of this type of movement is that the rack sections are alternatively engaged with the teeth of the gear 36 to advance the platen in a counterclockwise direction. The shaft 37 and the shaft 27 are positioned to provide a slight offset from each other so that a partial overlap of engagement between the rack sections 33 and 34 and the teeth of the gear 36 is attained.

A forward line feed operation may be also accomplished by operation of a key lever mechanism generally designated by the reference numeral 46. Depression of the key lever causes a sliding movement to be imparted to a link 47, included in the key lever mechanism, thereby moving the trip latch 22 into position to release the stop member 23 from the clutch 24. Upon release of the clutch 24, a forward line feed operation is accomplished in the manner heretofore described.

Referring to Figs. 2 and 3 a mechanism is disclosed for obtaining a reverse line feed operation and elements which are identical to the elements shown in Fig. 1 are designated by identical reference numerals. When a signal is received which is indicative of a reverse line feed operation, the code bars 10 are accordingly positioned. The bail 12 moves towards the right to permit a function bar 51 to move within the notches formed in the code bars 10. A trailing projection 52 of the function bar 51 drops within a notch 53 formed in a function latch 54, consequently, when the bail 12 returns to its initial position, the projection 52 operating in the notch 53 moves the function latch 54 toward the left. A detent 56 formed on the function latch 54 engages an interponent 57 to cause said interponent to pivot against the effect of a spring 58 to move a push rod 59 into engagement with an L-shaped rocker arm 61. Movement is thereby imparted to the rocker arm 61 to cause it to pivot about a pivot shaft 62 in a clockwise direction. The lower extremity of the L-shaped rocker arm 61 is positioned in register with a projection 63 formed on a member 64 which is mounted for sliding and pivotal movement through the instrumentality of a slot 66 and stud shaft 67 mounting. Urging the slide member 64 toward the right is an extended tension spring 68 but the slide member is precluded from movement by means of a cam projection 69 engaging a stud 70 mounted on an arm 71 formed integral with a collar 72 mounted about roller bearings 73 on the shaft 26. Also formed on the member 64 is a latch projection 74. It may be, therefore, appreciated that when the L-shaped rocker arm 61 pivots, the projection 63 is engaged and moved because the member 64 can pivot about the stud shaft 67 against the effect of the tension spring 68 and as a result the latch projection 74 is moved into register with the trailing extremities of the feed levers 31 and 32.

Formed on the L-shaped rocker arm 61 is a detent 76 which overlies the trip latch 22 and manifestly the trip latch 22 withdraws the stop 23 from the clutch 24. The detent 76 is spaced from the trip latch 22 so that the trip latch is not released until after the member 64 pivots to position the latch projection 74 in register with the trailing extremities of the feed levers 31 and 32.

As previously described, release of the clutch 24 imparts clockwise movement to the shaft 26 and again the shaft 26 through the gear (not shown) imparts a counterclockwise movement to the eccentrics 28 and 29. As the eccentric 28 moves counterclockwise the eccentric radius moves towards the right and assumes a position such as shown in Fig. 3 in which position the rack section 33 formed on the feed lever 31 engages the teeth of the gear 36 because a lower extremity of the feed lever 31 is held by the latch projection 74 thereby permitting the eccentric to work against the tension spring 41.

Again referring to Fig. 3, it may be seen that in this position the eccentric 29 extends towards the left and the lower extremity of feed lever 32 is held between the stud 70 and latch projection 74; thus, the upper shank portion of the feed lever 32 acts against the pivot roller 39 to move said pivot roller and the lever 38 against the action of the heavy spring 41 to thereby render ineffective the pivot roller to control the operation of the reverse line feed mechanism. The path that the rack sections 33 and 34 follow is shown in the dotted arrow diagram positioned to the left of the gear 36. When the rack sections 33 and 34 follow this path, a clockwise movement is imparted to the gear 36 to likewise move the platen in a clockwise direction which is the reverse of the direction moved by the mechanism shown in Fig. 1.

There is also associated with this reverse line feed mechanism a key lever linkage generally depicted by the reference numeral 81 which includes a link 82 connected to a bell crank member 83. The key lever linkage 81 also includes a slide link 84 for actuating the trip latch 22.

When the key lever mechanism 81 is actuated, the link 82 is moved towards the left to cause the bell crank member 83 to move in a clockwise direction. Inasmuch as the free extremity of the bell crank member 83 abuts the member 64, the member 64 is moved up into position so that the latch projection 74 is in register with the trailing extremities of the feed levers 31 and 32. The slide link 84 is spaced from the trip latch 22, consequently, the slide link does not move the trip latch until after the latch projection 74 is positioned in register with the trailing extremity of the feed levers 31 and 32. With the latch projection 74 moved to its upper position and the trip latch 22 actuated, the mechanism will again function as previously described to effectuate a reverse line feed operation.

Briefly summarizing the operation of the device shown in Fig. 1 with respect to the device shown in Figs. 2 and

3; it will be understood that upon depression of the key lever shown in Fig. 1 or the selective positionment of the code bars **10** shown in Fig. 1 a forward line feed operation is performed whereas upon depression of the key lever shown in Fig. 2 or the selective positionment of the code bars **10**, a reverse line feed operation is performed. In Fig. 1 feed levers **31** and **32** operate in conjunction with the pivot roller **39** to cause the rack sections **33** and **34** to move in a clockwise direction. In the mechanism shown in Figs. 2 and 3 the pivot roller **39** is rendered ineffective and the levers **31** and **32** thereupon pivot about the stud **70** to cause the rack sections **33** and **34** to move in a counterclockwise direction. In the mechanism shown in Fig. 2 the member **64** is mounted by means of the slot **66** and stud shaft **67** thereby permitting the feed levers **31** and **32** to slide the member **64** toward the right without disrupting the pivoted joint established between the feed levers **31** and **32** and the member **64**. The spring **68** is heavier than the springs **42** and **43**, consequently, these springs cannot slide the member **64** without the aid of the eccentrics **28** and **29**. Due to the out of phase positionment of the eccentrics **28** and **29**, the feed levers **31** and **32** are caused to pivot about the stud **70** to alternatively move the rack sections **33** and **34** into engagement with the gear **36** to effect a reverse line feed movement of the platen mounted on the platen shaft **37**.

Referring now to Fig. 4 there is disclosed an alternative embodiment of the invention wherein operation of a key lever actuates a reverse line feed operation. In this figure where elements are identical to elements described in relation to the embodiment of the invention shown in Figs. 1 to 3, then like reference numerals are used to identify like elements. A key lever mechanism generally denoted by the reference numeral **101** includes a link **102** slidably mounted in a slotted U-shaped bracket **103**. A spring **104** holds the link **102** from riding on the bottom of the slot. The link **102** is provided with a cam surface **105** on its underside and adapted to ride on this cam surface is a roller **106** mounted on a member **107**. Member **107** is mounted by means of slot **108** and stud **109** to provide for pivotal and translatory movement of the member. Formed on member **107** is a pair of latching abutments **111** and **112**.

The actual mechanism for attaining an advance of the platen is substantially the same as that disclosed in Fig. 1 with the exception that a pivot lever **113** is pivotally mounted about its midpoint thereby providing a trailing extremity which terminates in the vicinity of the trailing extremities of the feed levers **31** and **32**. Lever **113** is biased by means of a heavy spring **114** to move a pivot roller **116** mounted thereon towards the shank portions of the feed levers **31** and **32**.

In operation of the mechanism shown in Fig. 4 to perform a forward line feed operation, a key lever (not shown) is depressed to release the clutch **24** whereupon counterclockwise movement is imparted to the eccentrics **28** and **29** to cause the feed levers **31** and **32** to pivot about the pivot roller **116** to alternately engage the gear **36** to advance the platen in a forward direction. When the effective radius of the eccentric **29** extends towards the left then the shank portion of the feed lever **32** moves the pivot roller **116** towards the left, therefore permitting the feed lever **31** mounted on the eccentric, whose radius extends towards the right, to pivot under the effect of the spring **43** to withdraw the rack section **33** from engagement with the teeth of the gear **36**. Again the elements are so positioned that one or the other of the rack sections **33** or **34** is in engagement with the teeth of the gear at all times and in fact the arrangement is such as to provide a partial overlap of engagement during a cycle of operation of the eccentrics **28** and **29**.

When it is desired to effect a reverse line feed operation, the key lever mechanism **101** is actuated to cause the link **102** to slide towards the left. As the link **102** moves towards the left, the low portion of the cam **105** is presented to the follower roller **106** to permit a spring **117** to pivot the member **107** about the stud shaft **109** to bring the projections **111** and **112** into lateral alignment with the trailing extremities of the feed levers **31** and **32** and the lever **113**. Subsequent to this positionment of the member **107**, the link **102** engages the trip latch **22** to withdraw the stop element **23** from the clutch **24** whereupon counterclockwise movement is again imparted to the eccentrics **28** and **29**. As the eccentrics **28** and **29** rotate, the trailing extremities of the feed levers **31** and **32** alternately act against the projetcion **111** to move the member **107** towards the right. Movement of the member towards the right causes this member to engage the trailing extremity of the lever **113** to move the roller **116** against the action of its spring **114** and thus out of effective engagement with the shank portions of the feed levers **31** and **32**. The feed levers **31** and **32** now alternately pivot about the projection **111** to describe a path of movement which is the reverse of that imparted to said feed levers during a forward feed operation. Stated in another way it may be realized that the effective pivot point for the feed levers **31** and **32** is transferred from a position above the eccentrics **28** and **29** to a position which is below said eccentrics. The result of such a change of pivot points is that the feed levers will now impart a movement to the rack sections **33** and **34** which is in a counterclockwise direction thereby causing the gear and the platen attached thereto to rotate in a clockwise direction which is indicative of a reverse line feed operation.

Another feature of this embodiment of the invention resides in the provision of a non-repeat mechanism which precludes the continuation of the reverse line feed operation following completion of one line feed operation even through the key lever mechanism **101** is held in an operated position. The outer casing of the clutch **24** is shaped to provide a cam surface **121** and cooperating therewith is a resiliently biased cam follower **122**. The cam follower **122** is pivotally mounted at one end and the other or free end engages a lip **123** formed on that section of the link **102** which engages the trip latch **22**.

When the key lever mechanism is maintained in an operated position, the link **102** is held in a leftward position, consequently, the trip latch is also held from the clutch **24** but as the clutch rotates, the high portion of the cam surface acts to pivot the cam follower **122** in a counterclockwise direction. The free end of the follower **122** thereupon pivots the link **102** against the effect of the spring **104** and out of engagement with the trip latch **24** to permit the latch to move into position to engage and stop the transmission of power through clutch **24** to the shaft **27**.

It is to be understood that the above-described arrangement of apparatus and construction of elemental parts are simply illustrative of the application of the principles of the invention and many other modifications may be made without departing from the spirit and scope of the invention.

What is claimed is:

1. In a printing apparatus, a platen, a pair of levers adapted to alternately advance the platen, unidirectionally movable cyclically operable means for oscillating the levers in a common path but out of phase with respect to each other, and selective means cooperable with the cyclically operable means for controlling the direction of the path of oscillation of the levers in either of two directions.

2. In a printing apparatus having a movable platen mounted therein, a pair of drive members for advancing the platen, a pair of out of phase cyclically operable means for alternatively moving the drive members in a first common path to advance the platen in a first direction, means for driving the cyclically operable means in one direction, and means cooperable with said cyclically operable means for changing the common path of move-

ment of the drive members to advance the platen in a second direction.

3. In a reversible line feed mechanism for printing telegraph apparatus, a platen, a pair of drive members for advancing the platen, cyclically operable means for moving the drive members, and selectable pivot means for said drive members adapted to control the direction and path of movement imparted to the drive members by the cyclically operable means.

4. In a printer having a rotatably mounted platen therein, a pair of drive members for advancing the platen, a pair of eccentric means individually associated with said drive members, said eccentric means being mounted out of phase with respect to each other, means for moving the eccentric means in one direction, means cooperable with said eccentric means for alternatively moving the drive members in a first common path to advance the platen in a first predetermined direction, and means for rendering ineffective said last mentioned means and cooperable with said eccentric means for changing the common path of movement of said drive members to advance the platen in a second predetermined direction.

5. In combination in a recorder, a platen, an instrumentality attached to said platen, a pair of drive members cooperable with said instrumentality, resiliently urged pivot means for urging the drive members into engagement with the instrumentality, a pair of cyclically operable means individually adapted to actuate said members, said cyclically operable means being angularly offset with respect to each other whereby said drive members are alternately engaged with said instrumentality to impart rotation to said platen in a forward direction, and means for engaging and holding the drive members against the effect of said resiliently urged pivot means whereby said cyclically operable means drives said members into alternate engagement with said instrumentality to impart rotation to said platen in a reverse direction.

6. In a printing telegraph apparatus, a rotatably mounted platen, a pair of levers adapted to rotate the platen, a pair of eccentrics positioned within strap sections formed at the midpoints of said levers, a first pivot means for engaging the levers between the strap sections and the platen, a second pivot means for engaging the levers beneath the strap sections, said pivot means each adapted to cooperate with said eccentrics to control the path of movement imparted to the levers, and selective means for rendering one of said pivot means ineffective and the other of said means effective.

7. In combination in a recorder, a platen, a pinion attached to said platen, a pair of rack members cooperable with said pinion, pivot means resiliently urged against said rack members to urge said rack members into engagement with said pinion, a pair of eccentrics mounted out of phase with respect to each other for driving said rack members to alternatively engage said pinion to impart a forward rotation to said platen, and means for engaging said racks to render said resiliently urged pivot means ineffective whereby said eccentrics drive said rack members to alternatively engage said pinion to impart a reverse rotation to said platen.

8. In a telegraph page printer, a rotatably mounted platen, a pair of levers adapted to advance the platen, an eccentric drive means for reciprocating the levers, a first pivot means adapted to engage the levers to cause said reciprocating levers to follow an arcuate like path to advance the platen in a first predetermined direction, a second pivot means adapted to engage the levers to cause said reciprocating levers to follows an arcuate like path to advance the platen in a second predetermined direction, and selectable means for rendering one or the other of said pivot means ineffective.

9. In a printing telegraph apparatus having a rotatably mounted platen, a pair of drive members for advancing the platen, a pair of cyclically operable means mounted out of phase with respect to each other for alternatively moving the drive members into position to advance the platen, a pivot element resiliently biased against the drive means, a clutch for controlling the cyclically operable means, means for releasing the clutch to effectuate an advance of the platen in a forward direction, a latch mounted for pivotal and sliding movement, and means for pivoting the latch into engagement with the drive members, said last named means being also effective to release said clutch whereupon the drive members slide said latch to render ineffective said pivot element whereby said drive members pivot about said latch to advance the platen in a reverse direction.

10. In a recorder having a rotatably mounted platen, a pair of drive members for rotating the platen, a pair of cyclically operable means mounted for rotation in an out of phase relationship, selectively operable means for operating the cyclically operable means to move the drive members, a resiliently biased pivot element positioned with respect to the platen and cooperating with the drive members to impart a prescribed arcuate like movement to the drive members in a first predetermined direction to rotate the platen in a forward direction, and means for engaging the drive members to render ineffective said pivot element whereupon operation of the cyclically operable means causes the drive members to effectuate a prescribed arcuate like movement in a direction opposite to said afore-defined predetermined direction to rotate the platen in a reverse direction.

11. In a printing telegraph apparatus, a rotatably mounted platen, a gear attached to said platen, a pair of levers each having teeth formed along one face thereof to cooperate with the gear, eccentric means mounted in the vicinity of the midpoints of said levers, a first pivot means positioned between said eccentric means and said gear adapted to engage said levers to control the movement imparted to the levers by the eccentric means to drive the platen in a first predetermined direction, a second pivot means, means for moving the second pivot means into engagement with the trailing extremities of the levers to control the movement imparted to the levers by the eccentric means, and means on said second pivot means for moving the first pivot means out of engagement with said levers.

12. In combination with a recorder, a platen, an instrumentality attached to said platen, a pair of drive members, a resiliently biased pivot element engaging and urging both said drive members into engagement with said instrumentality, a pair of cyclically operable means mounted to operate out of phase with respect to each other for alternatively engaging one of the drive members with said instrumentality and pivoting the other of said drive members about said pivot element, a latch member mounted for sliding and pivotal movement, and means for pivoting said latch into position to engage both said drive members and said pivot element whereby said drive members cause said latch to slide to move said pivot element from effective engagement with the drive members.

13. In a printing telegraph apparatus, a platen, a gear attached to said platen, a pair of levers having rack sections formed thereon to cooperate with said gear, a pair of eccentrics mounted 180° out of phase with respect to each other, a yieldably mounted pivot element for engaging said levers whereby movement of said eccentrics effectuates an alternate movement of said levers about said pivot element and an alternate engagement of said racks with said gear, a pivotally and slidably mounted latch member, means for pivoting the latch member into position to engage said levers whereupon said levers impart a sliding movement to said latch, and an abutment formed on said latch member for moving said pivot element out of engagement with said levers.

14. In a recorder having a rotatably mounted platen, a pair of drive members for advancing the platen, a pair of cyclically operable means mounted out of phase with respect to each other for imparting movement to said drive

members, a pivot element cooperating with said drive members to alternatively render effective said drive members to advance the platen in a forward direction, a latch, a roller mounted on said latch, a cam cooperating with said roller for holding the latch from said drive members, and means for moving the cam to permit the latch to move into position to engage the drive members and pivot element whereby said cyclically operable means impart movement to said drive members to advance the platen in a reverse direction.

15. In a printing telegraph apparatus having a platen rotatably mounted therein, a pair of drive members for advancing the platen, a pair of cyclically operable means for actuating the drive members in one direction to effectuate a forward line feed operation of the platen, a clutch for controlling the operation of the cyclically operable means, a latch for engaging the drive members to reverse the direction of movement of drive members to effectuate a reverse line feed operation of the platen, a key lever mechanism adapted to be depressed to effectuate the sequential positionment of the latch and release of the clutch, and means for limiting the reverse line feed operation to a certain amount regardless of the position of the key lever mechanism.

16. In a recorder, a platen, a drive member for advancing the platen, cyclically operable means for oscillating the drive member, a pair of pivot means, each of said pivot means adapted to cooperate with said cyclically operable means to control the path of oscillation of said drive member in a single direction, and selectively operable means for rendering one of said pivot means effective and the other ineffective.

17. In a recorder, a platen, a plurality of drive members, cyclically operable means for concurrently oscillating the drive members in an out of phase relationship, means for unidirectionally rotating the cyclically operable means, a first means cooperable with the cyclically operable means for alternatively moving said drive members into position to advance the platen in a first direction, and a selectively operable second means cooperable with said cyclically operable means for alternatively moving said drive members into position to advance the platen in a second predetermined direction.

References Cited in the file of this patent

UNITED STATES PATENTS

1,133,004	Carlin	Mar. 23, 1915
1,211,653	Yaw	Jan. 9, 1917
1,218,118	Reirdon	Mar. 6, 1917
2,505,729	Zenner	Apr. 25, 1950