

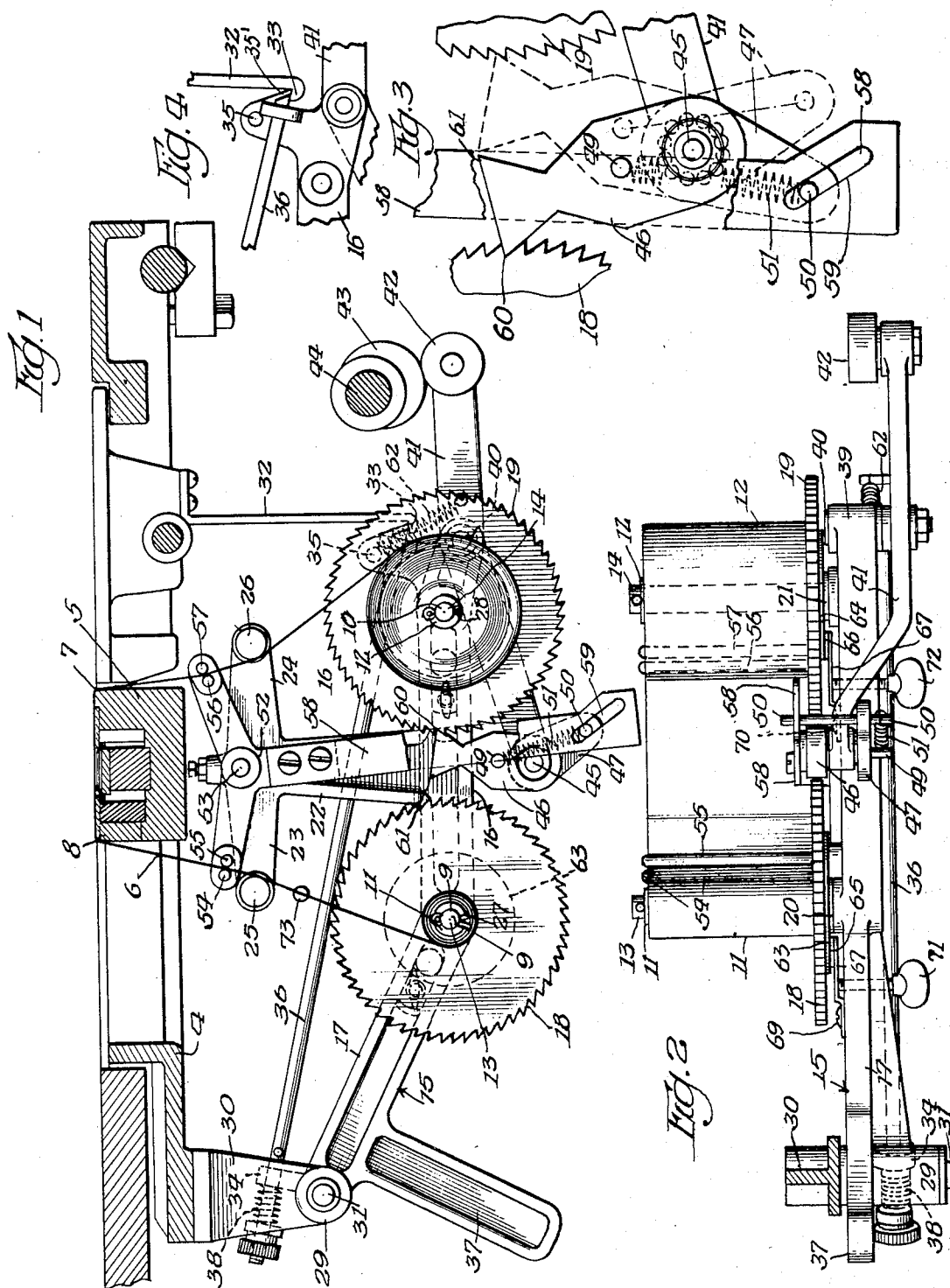
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PRINTING MACHINE

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PRINTING MACHINE

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17 Claims. (Cl. 101—336)

This invention relates to a novel ink ribbon feeding and reversing device for printing machines and the like, and the principal objects are to provide an ink ribbon feeding and reversing device which may be constructed as a unit to facilitate installation and removal thereof in the machine in which it is to be used and to permit replacement of the entire device when so desired or necessary; in which the ribbon spools may be easily installed in position to permit the ribbon to be unwound from one spool and wound on another; in which the direction of travel of the ribbon may be reversed to cause the ribbon to wind onto the spool from which it has been unwinding as it is unwound from the spool on which it has been winding and to control this reversing of the movement by the ribbon; in which adjustable tension may be applied on the ribbon spools to maintain the ribbon taut in the extent thereof between the spools and to insure neat winding thereof on the spools; in which a single driving member will be provided that may be moved into engagement with either of the ribbon spool driving members to thereby rotate the ribbon spool on which ribbon is to be wound; and which will be of simple and economical construction and positive in operation and which may be so mounted that it may be swung to and from operating position to facilitate ribbon installation and removal.

I have shown the invention herein as applied to the printing machine described and claimed in my co-pending application No. 469,953, filed July 23, 1930.

A selected embodiment of the invention is illustrated in the accompanying drawing and therein

Fig. 1 is a side elevation of a ribbon feeding and reversing mechanism constructed in accordance with my invention and installed in a typical manner in a printing machine;

Fig. 2 is a bottom plan view of the device as illustrated in Fig. 1;

Fig. 3 is a detail view, drawn to an enlarged scale, depicting the driving mechanism; and

Fig. 4 is a detail view.

Referring to the drawing wherein my novel ribbon feeding and reversing mechanism is disclosed, 4 indicates the bed of the printing machine with which my invention is to be associated, said bed including an anvil 5 of the usual type on which the printing device is rested, and the ribbon 6 is directed over the upper surface of the anvil 5, suitable guides 7 and 8 being provided on opposite sides of the anvil for the ribbon. Opposite ends of the ribbon are secured to the spin-

dles 9 and 10 of suitable spools. The spindles are respectively mounted on hubs 11 and 12 which in turn are arranged on the stub shafts 13 and 14. The frame of my improved ribbon device includes a casting generally indicated by 15, embodying an arm 16 from one end of which an arm 17 extends, said arm 17 being arranged at an angle to the arm 16. The stub shaft 13 is fixed in the arm 16 adjacent the juncture of said arm with the arm 17, while the stub shaft 14 is fixed in the arm 16 in spaced relation with the stub shaft 13. Preferably, though not necessarily, the stub shafts 13 and 14 are spaced in an amount slightly greater than the extent of the anvil over which the ribbon 6 is to be directed, this facilitating guiding of the ribbon to the anvil. At the inner ends of the hubs 11 and 12, ratchet wheels 18 and 19 are fixed. On the faces of the ratchet wheels adjacent the arm 16 spacing hubs 20 and 21 are provided, the spacing hubs being disposed intermediate the ratchet wheels and the arm. Extending upwardly from the arm 16 at the medial portion thereof is an arm 22 having at the upper end thereof branches 23 and 24 that extend substantially parallel to the arm 16. Fixed in the arms of the branches 23 and 24 are guide rods 25 and 26, and from the periphery of the ribbon wound on the spindles said ribbon is directed over adjacent sides of the guide bars 25 and 26 from whence it is directed to the guide bars 8 and 7. To prevent displacement of the spindles 9 and 10 from the hubs 11 and 12, suitable retaining devices 27 and 28, such as cotter keys, are provided. In the foregoing manner the ribbon is arranged in position and is directed over the anvil for the purpose well understood in the art. To mount the above structure in position, I provide at the end of the arm 17 a bearing structure 29. A bracket 30 depends from the bed 4 and a shaft 31 is extended through a bearing portion at the lower end of the bracket and through the bearing portion 29, and in this manner the casting 15 is pivotally supported in position. Preferably, the arm 16 is horizontally disposed, when in operating position, and to retain the arm in this position, a spring arm 32 is provided which depends from the frame 4 and which has a lip 33 at the lower end thereof. A boss 35 extends upwardly from the arm 16 and has a nose 35' thereon which rests on the lip 33. A boss 34 extends upwardly from the bearing portion 29 and this boss and the boss 35 have aligned openings therein through which a rod 36 is extended. The inner end of the rod 36 may be moved, against the action of the spring 38 dis-

posed thereabout, to move arm 32 to disengage lip 33 from nose 35'. A handle 37 depends from the bearing portion 29 and by gripping this handle the casting 15 may be readily pivoted about the shaft 31 after the disengagement of the nose 35'. When the casting 15 is pivoted downwardly, access to the ribbon and the spools therefor may be readily had which facilitates installation and removal of the ribbon.

A bearing 39 is provided on the arm 16 adjacent the free end thereof and a stud shaft 40 is journaled therein. The medial portion of a rocker 41 is pivotally mounted on this stud shaft. At the outer end of the rocker 41, a roller 42 is mounted which bears against a cam 43 mounted on the shaft 44, this shaft being one of the driving shafts of the machine with which the device is associated. While I have shown a roller 42 at the end of the rocker 41 and have illustrated said roller as bearing against a cam, this arrangement serving to impart a rocking movement to the rocker 41, it is to be understood that any other suitable means might be provided to impart the rocking movement without departing from the purview of my invention. At the inner end of the rocker 41, a suitable stud shaft 45 is provided, and on one end of this stud shaft, on one side of the rocker 41, a dog 46 is arranged, said dog preferably being mounted on an anti-friction bearing carried by the stud shaft 45. As best illustrated in Fig. 1, the dog 46 extends upwardly from the stud shaft 45. On the opposite end of the shaft 45 on the other side of the rocker 41, there is a dog 47, also mounted on an anti-friction bearing. Since both the dogs 46 and 47 are mounted on anti-friction bearings, it is apparent that movement thereof will be very free, this being advantageous as will be made apparent presently. Extending from the dog 46 past the rocker 41 is a pin 49 and a pin 50 extends through the dog 47 and projects from both faces thereof. A spring 51 extends between the free ends of the pins 49 and 50, past the adjacent end of the stud shaft 45, this arrangement being part of an over-center device. A substantially T-shaped rocker 52 is pivotally mounted, as indicated at 53, on the upper end of the arm 22. Adjacent the ends of the branches of the T-shaped rocker 52, cooperating pairs of pins 54 and 55 and 56 and 57 are provided, these pairs of pins being slightly spaced from each other and having the ribbon 6 directed therebetween. Foot portions are provided on the outer ends of the branches of the T-shaped member 52, which foot portions alternately engage the guide rods 25 and 26. An arm 58 is connected to the stem of the T-shaped bracket 52 and at the lower end of this arm 58 there is an angularly extending slot 59 through which the adjacent end of the pin 50 is extended. The upper end of the dog 46 is substantially keystone-shaped and provides pawl portions 60 and 61. The spring 51 acts on the dog 46 to hold one of the pawl portions thereof in engagement with the teeth of one of the ratchet wheels. A spring 62 extends between the boss 35 and the rocker 41 to urge the roller 42 upwardly into engagement with the cam 43, the engagement of the pin 50 with the lower end of the slot 59 also serving to limit the action of this spring. On the faces of the ratchet wheels 18 and 19 disposed toward the arm 16, hub portions 63 and 64 are arranged, said hub portions providing flat faces. Resting against the flat faces of the hub portions 63 and 64 are friction plates 65 and 66 carried at the free ends of spring

arms 67 and 68, opposite ends of said spring arms being connected to the arm 16, as indicated at 69 and 70. Thumb screws 71 and 72 are mounted in the arm 16 and the ends thereof and bear against the arms 69 and 70 to regulate the tension of the friction plates 65 and 66 on the faces of the hub portions 63 and 64 to thus determine the drag on the ratchet wheels 18 and 19 and, therefore, the spools. In the ribbon 6 adjacent each end thereof is a button such as 73. The purpose of this button will be made apparent presently.

In use, the ribbon spools are arranged on the hubs 11 and 12 in the manner previously described. At the start of the operation most of the ribbon is wound on one spool as, for example, in the present instance the ribbon will have been wound on spool 9. The over-center device, including the spring 51, will be arranged with the pawl portion 60 of the dog 46 engaging the teeth of the ratchet wheel 19. Therefore, as the cam 43 acts on the roller 42 to impart rocking movement to the rocker 41, it is manifest that the end of the rocker 41 carrying the stud shaft 45 will alternately move up and down, and on the up movement the pawl portion 60 will be seated in one of the teeth of the ratchet wheel 19 and will turn said ratchet wheel and cause the spool 10 to wind ribbon thereon while it will be unwound from the spool 9. This action will continue until the end of the ribbon 6, wound on the spool 9, will be approached and the button 73 will be fixed in the ribbon adjacent this end. Said button 73 will move with the ribbon until it engages the pins 54 and 55. These pins 54 and 55 are arranged to prevent passage of the button 73. Therefore, after the button engages the pins and upon the next movement of the dog 46, the movement of the ribbon will pivot the T-shaped bracket 52 and the foot portion adjacent the pin 57 will engage the guide rod 26, the foot portion at the opposite end being moved from engagement with the guide rod 25. This will move the arm 58 from the position of Fig. 1 into the dotted-line position shown in Fig. 3 and will incline the spring 51 in the direction opposite to that in which said spring has been inclined. Therefore, said spring will act on the dog 46 to snap the dog 46 over to engage the pawl portion 61 thereof with the teeth of the ratchet wheel 18. Movement imparted to the dog 46 will therefore be imparted to the ratchet wheel 18 and in turn to the spool 9. The spool 9 will be driven to wind ribbon thereon and to unwind ribbon from the spool 10, and this will continue until the button 73, adjacent the opposite end of the ribbon 6, will engage the pins 56 and 57 at which time the bracket 52 will be pivoted to move the arm 58 and parts associated therewith back into the position of Fig. 1.

From the foregoing description, it is apparent that I have provided a ribbon feeding and reversing device which will automatically reverse at the time when substantially all the ribbon has been unwound from one spool to cause the ribbon to wind on the spool from which it has been unwound, and it is apparent that this action is brought about by the ribbon or rather by means provided on the ribbon. Further, the device is constructed as a unit and may be therefore readily installed or removed which greatly facilitates repair, when this is necessary. Further, since the device may be pivoted from operating position into such a position that access thereto may be easily had and the ribbon may be,

therefore, readily installed or removed, it being apparent that the ribbon will unwind to form a loop during this movement from operating position by reason of the extent thereof over the anvil 5. Further, by reason of the fact that the shifting mechanisms are mounted on anti-friction bearings, it is apparent that the reversing may be very easily brought about and will require very little additional power. Since the reversing is brought about by buttons on the ribbon, it is apparent that the time of reversing may be nicely adjusted to occur at the proper time. In addition to the foregoing, it is readily manifested that the device is of very simple construction and may, therefore, be economically manufactured and easily installed.

While I have illustrated and described a selected embodiment of my invention, it is to be understood that this device is capable of modification and I do not wish to be limited to precise details set forth but desire to avail myself of the scope of the invention as set forth in the following claims:

I claim:

1. An ink ribbon feeding and reversing device comprising a supporting member, a pair of ribbon spools rotatably mounted on said supporting member and having movement receiving means connected thereto, means for imparting a step-by-step movement to said spools and including a driving member engageable with the movement receiving means of either of said spools, a rockable arm mounted substantially medially on said supporting member and carrying said driving member at one end thereof and having the other end thereof extended to and adapted for cooperation with an operating device, and means for releasably holding said supporting member in position to retain the rockable arm in cooperating relation with the operating device.
2. An ink ribbon feeding and reversing device comprising supporting means for a pair of rotatable spools adapted to have a ribbon wound thereon and having movement receiving means connected thereto, a movement imparting member, means mounted on said supporting means and carrying and operating said movement imparting member, and means carried by said supporting means and having a pin and slot connection with said movement imparting member and adapted to engage said movement imparting member with the movement receiving means of one of said spools when substantially all of the ribbon is unwound therefrom whereby the movement will be imparted to said spool to wind the ribbon thereon.
3. An ink ribbon feeding and reversing device comprising a supporting member, a pair of spools rotatably mounted on said supporting member and adapted to have a ribbon wound thereon and having movement receiving means connected thereto, a movement imparting member, engaging means for holding said movement imparting member in engagement with one or the other of said movement receiving means, an arm pivotally mounted on said supporting member and carrying said movement imparting member at one end thereof and having driven means at the other end thereof adapted to cooperate with an operating device to receive movement therefrom, means on said ribbon for operating said engaging means to move said movement imparting member from engagement with one of the movement receiving means into engagement with the other of the movement receiving means when

substantially all of the ribbon is unwound from one of said spools, and means for releasably holding said supporting member in position to retain said driven means in cooperating relation with said operating device.

4. An ink ribbon feeding and reversing device comprising a movable supporting member, a pair of spools rotatably mounted on said supporting member and having an ink ribbon wound thereon, means mounted on said supporting member for imparting a step-by-step movement to said spools and including a driving member and driven means engaged with an operating member to operate said driving member, means for reversing said step-by-step movement and including a pivotally mounted member having means thereon alternately engageable with devices on the ribbon to be moved into alternate positions, an over-center device connecting said pivotally mounted member to said driving member to move said driving member to effect reversal of said step-by-step movement as said pivotally mounted member is moved into alternate positions, and means for releasably holding said supporting member in position to retain said driven means in engagement with said operating member.

5. An ink ribbon feeding and reversing device comprising a pair of rotatably mounted spools having an ink ribbon wound thereon, means imparting a step-by-step movement to said spools and including a driving device, means for reversing said step-by-step movement and including a pivotally mounted member having means thereon alternately engageable with devices on the ribbon to be moved into alternate positions, said pivotally mounted member having an inclined slot therein, and a pin on said driving device disposed in said slot and movable therethrough to effect reversal of said step-by-step movement as said pivotally mounted member is moved into alternate positions.

6. An ink ribbon feeding and reversing device comprising a pair of rotatably mounted spools having an ink ribbon wound thereon, means imparting a step-by-step movement to said spools and including a driving member, means for reversing said step-by-step movement and including a pivotally mounted member having means thereon alternately engageable with devices on the ribbon to be moved into alternate positions, an over-center device connected to said driving member, a pin on said over-center device, said pivotally mounted member having an inclined slot therein adapted to receive said pin whereby said pin may move through said slot to actuate said over-center device to move said driving member to effect reversal of said step-by-step movement as said pivotally mounted member is moved into alternate positions.

7. An ink ribbon feeding and reversing device comprising a supporting member having ribbon receiving spools mounted thereon in spaced relation, means for guiding the ribbon from one of said spools to the other and over a printing device, supporting means for said supporting member, and means for retaining said supporting member in operating position.

8. An ink ribbon feeding and reversing device comprising a supporting member having ribbon receiving spools mounted thereon in spaced relation, means for guiding the ribbon from one of said spools to the other and over a printing device, supporting means for said supporting member, means for retaining said supporting member in operating position, and means for moving said

retaining member from retaining position whereby said supporting member may be moved from operating position about the supporting means therefor.

- 5 9. An ink ribbon feeding and reversing device comprising an arm, a pivotal mounting for said arm, means for retaining said arm in operating position, ribbon spools on said arm, and means for directing a ribbon from one of said spools to the other of said spools and over a printing device.
- 10 10. An ink ribbon feeding and reversing device comprising a supporting arm, spaced studs on said supporting arm, movement receiving means rotatably mounted on said studs, spools connected to said movement receiving means and adapted to have a ribbon wound thereon, means for driving said movement receiving means, a rocker pivotally mounted on said arm and having said driving means mounted thereon, and means for rocking said rocker whereby said driving means will engage said movement receiving means to rotate said spools whereby the ribbon will be wound on one of said spools as it is unwound from the other of said spools.
- 25 11. An ink ribbon feeding and reversing device comprising a supporting arm, spaced studs on said supporting arm, movement receiving means rotatably mounted on said studs, spools connected to said movement receiving means and adapted to have a ribbon wound thereon, means for driving said movement receiving means, a rocker pivotally mounted on said arm and having said driving means mounted thereon, and means for reversing the movement imparted to said ribbon when substantially all of the ribbon is unwound from one of said spools whereby said ribbon will be wound on the other of said spools.
- 35 12. An ink ribbon feeding and reversing device comprising a supporting arm having spools adapted to have a ribbon mounted thereon in spaced relation, movement receiving means connected to said ribbon spools, a movable member carried by said supporting arm, a driving member, a rockable member carrying said driving member, and an over-center device, said movable member being movable into alternate position to operate said over-center device to shift said driving member from one of said movement receiving means to the other of said movement receiving means to alternately rotate said spools to wind the ribbon on one of said spools while it is unwound from the other of said spools.
- 40 13. An ink ribbon feeding and reversing device comprising a supporting arm having spools adapted to have a ribbon mounted thereon in spaced relation, movement receiving means connected to said ribbon spools, a movable member carried by said supporting arm, a driving member, a rockable member carrying said driving member, an over-center device, and means for moving said movable member to operate said over-center device to shift said driving member from engagement with one of said movement receiving means into engagement with the other of said movement receiving means whereby the spool from which the ribbon was being unwound prior to said shifting will be rotated to wind the

ribbon thereon as it is unwound from the other of the spools.

14. An ink ribbon feeding and reversing device comprising a supporting arm, spaced studs on said supporting arm, movement receiving means rotatably mounted on said studs, spools connected to said movement receiving means and adapted to have a ribbon wound thereon, means for driving said movement receiving means, a rocker pivotally mounted on said arm and having said driving means mounted thereon, a bracket arm on said supporting arm, means for guiding said ribbon carried by said bracket arm, and means mounted on said bracket for causing said driving means to shift from engagement with one of said movement receiving means into engagement with the other of said movement receiving means.

15. An ink ribbon feeding and reversing device comprising a supporting arm, spaced studs on said supporting arm, movement receiving means rotatably mounted on said studs, spools connected to said movement receiving means and adapted to have a ribbon wound thereon, means for driving said movement receiving means, a rocker pivotally mounted on said arm and having said driving means mounted thereon, a bracket arm on said supporting arm, a rocker arm on said bracket arm and means connected to said rocker arm for shifting said driving means from engagement with one of said movement receiving means into engagement with the other of said movement receiving means.

16. An ink ribbon feeding and reversing device comprising a supporting arm, spaced studs on said supporting arm, movement receiving means rotatably mounted on said studs, spools connected to said movement receiving means and adapted to have a ribbon wound thereon, means for driving said movement receiving means, a rocker pivotally mounted on said arm and having said driving means mounted thereon, a bracket arm on said supporting arm, a rocker arm on said bracket arm, means for limiting movement of said rocker arm, and means connected to said rocker arm for shifting said driving means from engagement with one of said movement receiving means into engagement with the other of said movement receiving means.

17. An ink ribbon feeding and reversing device comprising a supporting arm, spaced studs on said supporting arm, movement receiving means rotatably mounted on said studs, spools connected to said movement receiving means and adapted to have a ribbon wound thereon, means for driving said movement receiving means, a rocker pivotally mounted on said arm and having said driving means mounted thereon, a bracket arm on said supporting arm, a rocker arm on said bracket arm, means for limiting movement of said rocker arm and for guiding the ribbon, means on said rocker arm engageable by means on the ribbon whereby said rocker arm will be moved to shift said driving means from engagement with one of said movement receiving means into engagement with the other of said movement receiving means.

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