

Sept. 7, 1943.

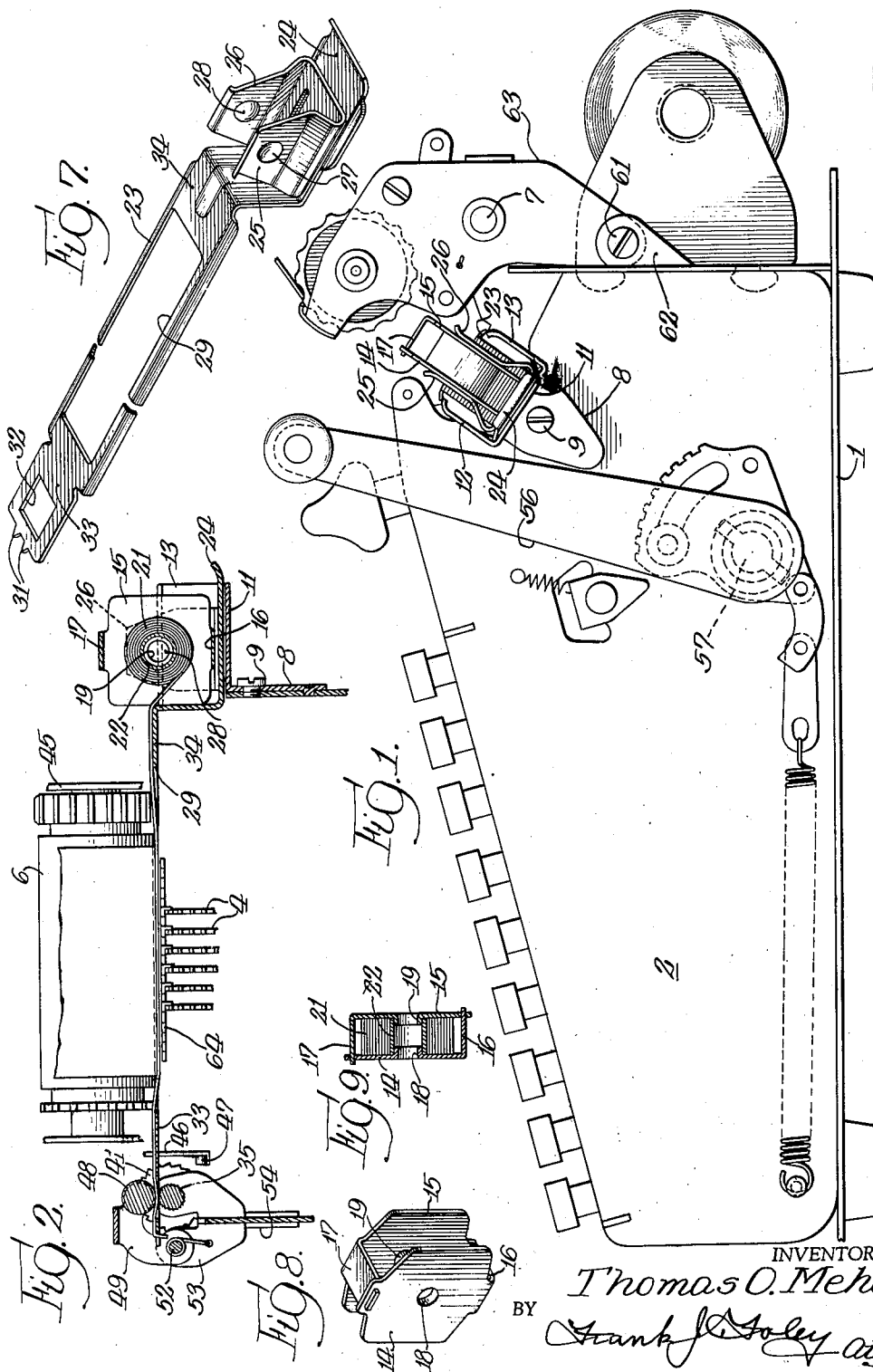
T. O. MEHAN

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RIBBON MECHANISMS

Original Filed May 25, 1939

3 Sheets-Sheet 1



Sept. 7, 1943.

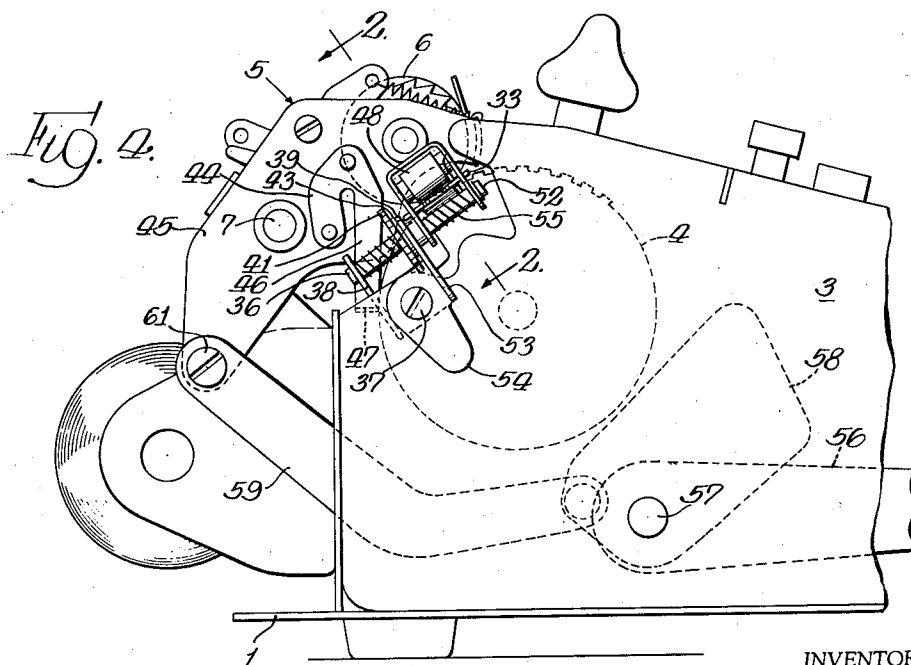
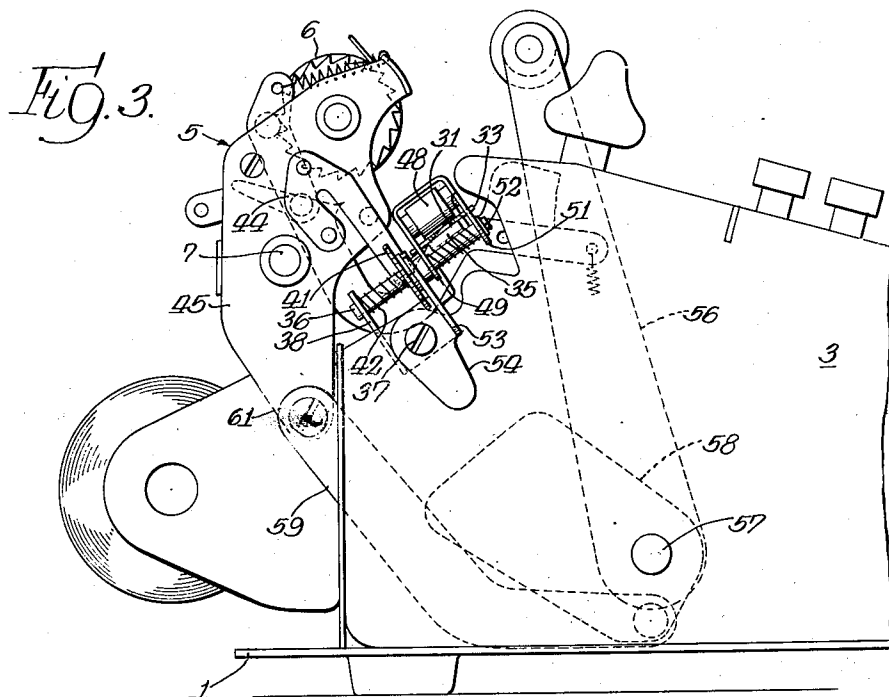
T. O. MEHAN

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RIBBON MECHANISMS

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3 Sheets-Sheet 2



INVENTOR.

INVENTOR.
Thomas O. Mehan;
BY Frank J. Foley *Att'y.*

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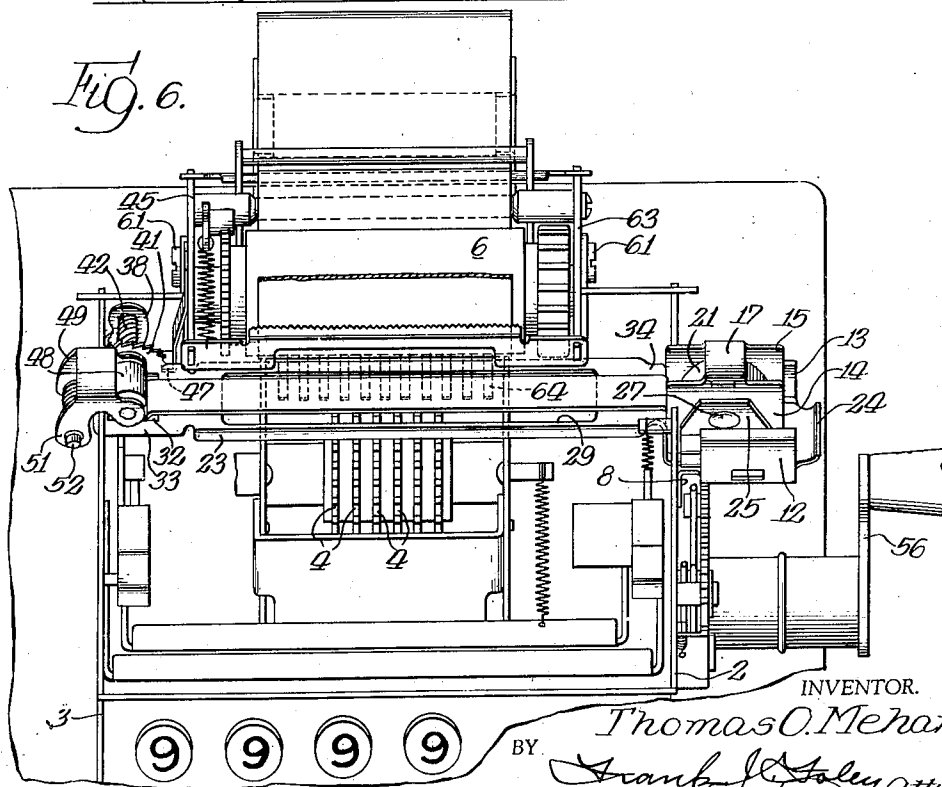
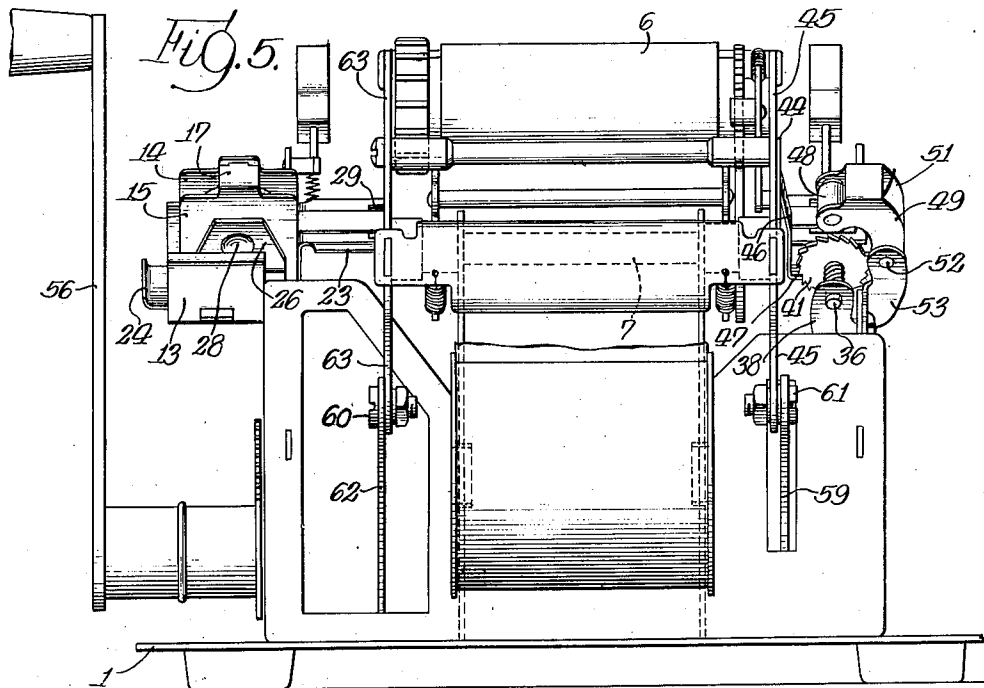
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RIBBON MECHANISMS

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UNITED STATES PATENT OFFICE

2,329,129

RIBBON MECHANISM

Thomas O. Mehan, Park Ridge, Ill.

Original application May 25, 1939, Serial No. 275,662. Divided and this application October 30, 1941, Serial No. 417,156

8 Claims. (Cl. 197—151)

This invention relates to ribbon mechanisms of the type which directly grip the ribbon and feed it through the printing position of a printing machine.

Woven fabric ink impregnated ribbons which have been more generally in use are usually mounted on a pair of spools on which the feeding mechanism acts directly to draw the ribbon through the printing position, and by means of a reversing device feed it back again to rewind it on the spool from which it previously had been unwound. When such ribbon mechanisms are used with calculating machines, each ribbon customarily has such length and durability that it outlasts several paper rolls, when subject to frequent use.

However, when a calculating machine is infrequently used throughout the course of a year, the ribbon may become too dry and must then be discarded without having rendered any substantial proportion of its possible full service.

To eliminate such wastage and other disadvantages of the spool-driven and re-usable fabric ribbons, I propose by this invention to make it convenient to employ single use paper ribbons and especially in such lengths and in such a manner that when adapted to calculating machines, a single ribbon will be used and discarded as each paper roll is used by the machine. Such an embodiment of the invention is herein illustrated, but it is not to be understood, however, that this invention is restricted to such employment.

While the ribbon which may be used with this invention may be of any suitable material it is economical to use paper which is durable enough for a single use.

One of the objects of this invention is to provide a simple and inexpensive ribbon feed mechanism suitable for the purpose above described.

Another object of the invention is to provide a feed mechanism designed to make easy the installation of a fresh ribbon.

Another object is to provide means for carrying the starting end of a newly installed ribbon across the printing position of the machine and operatively connecting it with the feeding device.

Other objects and advantages of the invention will be apparent from the following specification in which is described an embodiment selected for illustrating the nature of the invention.

In the drawings, Fig. 1 is a side elevation of an adding machine equipped in accordance with my invention.

Fig. 2 is a sectional view on the line 2—2 of Fig. 4.

Fig. 3 is a side elevation of a portion of the machine as viewed from the side opposite to that shown in Fig. 1, and showing the machine at rest.

Fig. 4 is a side elevation similar to that of Fig. 3 except that the platen roll has been rotated forwardly and downwardly into the printing position.

Fig. 5 is a rear elevation of the machine.

Fig. 6 is a plan view of a portion of the machine.

Fig. 7 is a perspective view of a ribbon inserter forming a part of the invention.

Fig. 8 is a perspective view of a ribbon holder suitable for mounting in the inserter of Fig. 7.

Fig. 9 is a central sectional view of the ribbon holder shown in Fig. 8.

Referring now to the drawings, the ribbon mechanism is illustrated as mounted on an adding machine having a base plate 1 and two main side frame plates 2 and 3, secured to the base plate. The machine illustrated is provided with type carrying wheels located in the position indicated by the wheel 4, while a rockable platen frame, generally indicated as 5 in Fig. 4, carries a platen roll 6, this frame being rockable about a pivot 7 to bring the platen roll forwardly and downwardly against the type wheels, as shown in Fig. 4.

A ribbon roll is mounted on the right-hand frame plate, and the ribbon is carried across the printing position formed at the plane where the platen roll contacts the type wheels and is gripped directly by a pair of feed rollers. In the preferred form, the ribbon holder is supported and located as follows: A bracket 8 is secured by a screw 9 or other suitable means to the right-hand frame plate and is shaped to provide a cradle having a bottom member 11 and two upwardly extending side members 12 and 13.

The preferred form of ribbon holder consists of a pair of plates 14 and 15 which are provided with offset members 16 and 17 whose reduced ends extend through apertures in the associated plates and are swaged over in order to lock these two plates together in a spaced apart relation. The centrally located hole in each plate is provided with an inwardly extending boss, indicated as 18 and 19, which form a bearing for a ribbon 21 coiled about a sleeve 22.

The ribbon inserter, best shown in Fig. 7, consists of an elongated member generally indicated as 23, having an offset step 24 on which

is fixed a pair of upstanding flanges 25 and 26, which flanges are provided with indented portions 27 and 28 which serve to grip the ribbon holder at its apertures 18 and 19. The member 23 is provided with an elongated aperture 29 which extends across the printing position and embraces the area through which type characters on the type wheels extend. When the ribbon holder is mounted in the ribbon inserter, the free end of the ribbon will then be drawn out to the opposite extremity of the ribbon inserter and impaled on the prongs 31. This assembly is then inserted into the machine in such a manner as to carry the end of the ribbon across the printing position until the step 24 slides in between the retaining flanges 12 and 13 of the bracket 8. At the same time, the prongs on the inserter and the ribbon will be pushed between the ribbon feed rolls and will pass slightly beyond them, so that the two rolls will grip the ribbon between them in the area formed by the aperture 32 of the ribbon inserter. Thus, the roll of ribbon is located and supported in the bracket at the right-hand side of the machine while the free end of the ribbon is gripped by the feed rolls at the left side of the machine, as clearly shown in Fig. 2.

As soon as the feed rolls begin to operate, they push the end of the ribbon off the prongs 31, and gradually draw the rest of the ribbon through the printing position across the flat portions 33 and 34 of the inserter, which then serve as guide plates for the ribbon. The used portion of the ribbon passing beyond the feed rollers will accumulate within the casing with which such a machine is usually covered and may be discarded at the time a new ribbon is inserted into the machine, at which time the inserter will be withdrawn in order to mount the new ribbon holder thereon.

One of the ribbon feeding rolls 35 is a knurled roller positioned beneath the ribbon and formed on a shaft 36 carried by a bracket secured on the inside of the side frame plate by the screw 37 and having a pair of flanges 38 and 39 through which the shaft extends. A ratchet wheel 41 is fixed on this shaft, and a spring 42 wound about the shaft bears against the flange 38 and the ratchet wheel 41 to hold the ratchet wheel snugly against a washer 43 lying between the ratchet wheel and the bracket flange 39. The spring 42 introduces enough friction on the knurled feed roller to hold it stationary, except when positively advanced by the pawl. A pawl 44 fixed on the side frame plate 45 of the rockable platen mechanism has a resilient portion 46 terminating in a hook 47 which will engage the teeth of the ratchet on the return stroke of the platen frame to thereby rotate the ratchet and knurled roller to the extent of one tooth on each return stroke.

An idler roller 48 is carried by a swingable bracket having arms 49 and 51 which are pivoted on a post 52, the latter being fixed in the flange 53 of a bracket 54 mounted on the outside of the main frame plate 3 and secured by the screw 37. A spring 55 surrounds the post 52 and is connected with the swingable bracket in which the idler roller is carrier in such a manner as to press the idler against the driven roller, but to permit sufficient yielding so that the prongs of the ribbon inserter may pass between the rollers. As shown in Figs. 3 and 4, the central portion of the idler roller is enlarged relatively to the ends of the roller so that it may

extend through the recess 32 in the ribbon inserter to firmly engage the ribbon against the driven roller.

As shown in Figs. 3 and 4, the ribbon feeding mechanism is operated as follows. The handle 56 is pulled forwardly to rock a main shaft 57 thereby rotating a cam plate 58 fixed on that shaft. Other functions of the shaft and cam do not form a part of this invention, hence will not be discussed here. Pivotally connected with the cam plate is a link 59 whose rear end is pivotally connected at 61 with the left-hand platen frame plate 45. A rotative force is also applied to the other side of the platen frame by a link 62 which is connected at 60 with platen frame plate 63, in order to equalize the pressure throughout the length of the platen roll against the type wheels; but for the purpose of explaining the operation of the feed rollers, it is necessary only to refer to Figs. 3 and 4. On the forward stroke, the rear end 47 of the spring pawl 46 will clear the ratchet wheel 43, but on the return stroke, it will engage the ratchet and rotate it to the extent of one tooth.

As shown in Fig. 2, the several type wheels 4 extend slightly through a comb 64 and the platen roll will press the paper to be printed upon against the ribbon overlying the type wheels. The flat surfaces 33 and 34 of the inserter hold the ribbon in proper alignment with the printing plane.

This application is a division of my application Serial No. 275,662, filed May 25, 1939, for a patent on "Adding machines."

It will now be appreciated that the invention herein described is applicable not only to adding machines but to other machines of the general class known as business machines which employ printing mechanisms.

It should be understood that the drawings and the foregoing specification illustrate and describe merely certain preferred forms of the invention, and that other modifications and variations of the invention are contemplated and are intended to be claimed in the appended claims.

Having shown and described my invention, I claim:

1. In combination with a printing machine, a pair of feed rollers constructed and positioned for directly gripping a ribbon after it has passed through the printing position and drawing it across the machine through the printing position thereof, means actuated by each printing stroke of the machine for positively rotating one of said rollers, and a ribbon-supporting device having means at one end thereof for retaining a ribbon spool, and means at the other end of said device for temporarily retaining the unrolled free end of a ribbon as the device is being attached to the machine for carrying said end through the printing position of the machine and operatively positioning it between said rollers without further unrolling of the ribbon.

2. In combination with a printing machine, a pair of feed rollers mounted on the machine at one side of the printing position for directly gripping a ribbon after it has passed through the printing position, means for driving one of said rollers, the other roller being mounted to bear yieldingly against the first roller, a ribbon-supporting device having a cradle at one end thereof for retaining a ribbon spool, a rigid member on said device extending from the cradle across the printing position to said rollers, means on the

end of said member for retaining the unwound end of a ribbon for inserting it between said rollers as the device is being attached to the machine, and means on the machine for retaining said device when the ribbon has been inserted between said rollers.

3. In combination with a printing machine, a pair of feed rollers constructed and positioned for directly gripping a ribbon after it has passed through the printing position and drawing it across the machine through the printing position thereof, means actuated by each printing stroke of the machine for positively rotating one of said rollers, and a ribbon-supporting device having means at one end thereof for retaining a ribbon spool, means at the other end of said device for temporarily retaining the free end of a ribbon as the device is being attached to the machine for carrying said end through the printing position of the machine and operatively positioning it between said rollers without further unwinding, said ribbon gripping means being so constructed that the subsequent feeding of the ribbon by the rollers will release the ribbon end from said means.

4. In combination with a printing machine, a pair of rollers constructed and positioned for directly gripping a ribbon after it has passed through the printing position and drawing it across the machine through the printing position thereof, means actuated by each printing stroke of the machine for positively rotating one of said rollers, and a ribbon-supporting and guiding device having means at one end thereof for retaining a ribbon spool, a rigid member on said device extending from the position of the spool past the printing position to said rollers, means on said member for retaining the unwound free end of a ribbon and carrying it between said rollers without further unwinding as the device is being moved into operative position on the machine, the intermediate portion of said device having a slot for embracing the printing position and having surfaces for guiding the ribbon on either side of said position.

5. In combination with a printing machine, a pair of rollers mounted on the machine at one side of the printing position for directly gripping a ribbon after it has passed through the printing position, means for driving one of said rollers, a ribbon support and guide device bodily removable from the machine having means at one end thereof for releasably retaining a ribbon spool, a rigid extension on said device constructed for extending across the machine from the position of the spool to the position of said rollers, ribbon guide surfaces on said member at

both sides of the printing position, a slot in said member embracing the printing position, another slot in said member embracing said rollers, means at the extremity of said member for temporarily retaining a ribbon end and forcing it between the rollers into feeding relation therewith when said device is being attached to the machine, the feeding of the ribbon by the rollers thereafter being adapted to release the ribbon from said gripping means, and means on the machine for releasably retaining said device in operative position.

6. In combination with a printing machine, a pair of feed rollers mounted on the machine at one side of the printing position for directly gripping a ribbon after it has passed through the printing position, means for driving one of said rollers, a ribbon-supporting and guiding device having means at one end thereof for retaining a ribbon spool, a rigid member on said device constructed for extending from the position of the spool across the machine past the printing position to the rollers, means at the extremity of said member for temporarily holding the free end of a ribbon, means on the machine for supporting and retaining said device, the whole being so arranged that said device may be attached to the machine by moving said member transversely across the machine until the end of the ribbon is inserted by said holding means between the feed rollers into feeding relation therewith.

7. In a machine having a printing mechanism, a ribbon roll, a pair of feed rolls for gripping and feeding the ribbon, and a ribbon inserter having means at one end for supporting the roll and having means at its other end for temporarily retaining the unwound free end of the ribbon whereby when the inserter and ribbon mounted thereon are inserted as a unit into the machine said free end will be forced through said rolls by said retaining means without further unwinding.

8. In a machine having a printing mechanism, a ribbon roll, a pair of feed rolls at one side of the machine for gripping the ribbon after it has passed through the printing position, a ribbon supporter and inserter having means at one end for supporting the roll and having rigid means at the other end for temporarily retaining the unwound free end of the ribbon and so constructed and proportioned that when the inserter is being inserted into the machine the free end of the ribbon will be forced between said feed rollers by the retaining means without further unwinding.

THOMAS O. MEHAN.