Nov. 27, 1934. E. W. COLLINS 1,981,946

COIL WRAPPING MACHINE

Filed Oct. 19, 1931 4 Sheets-Sheet 1

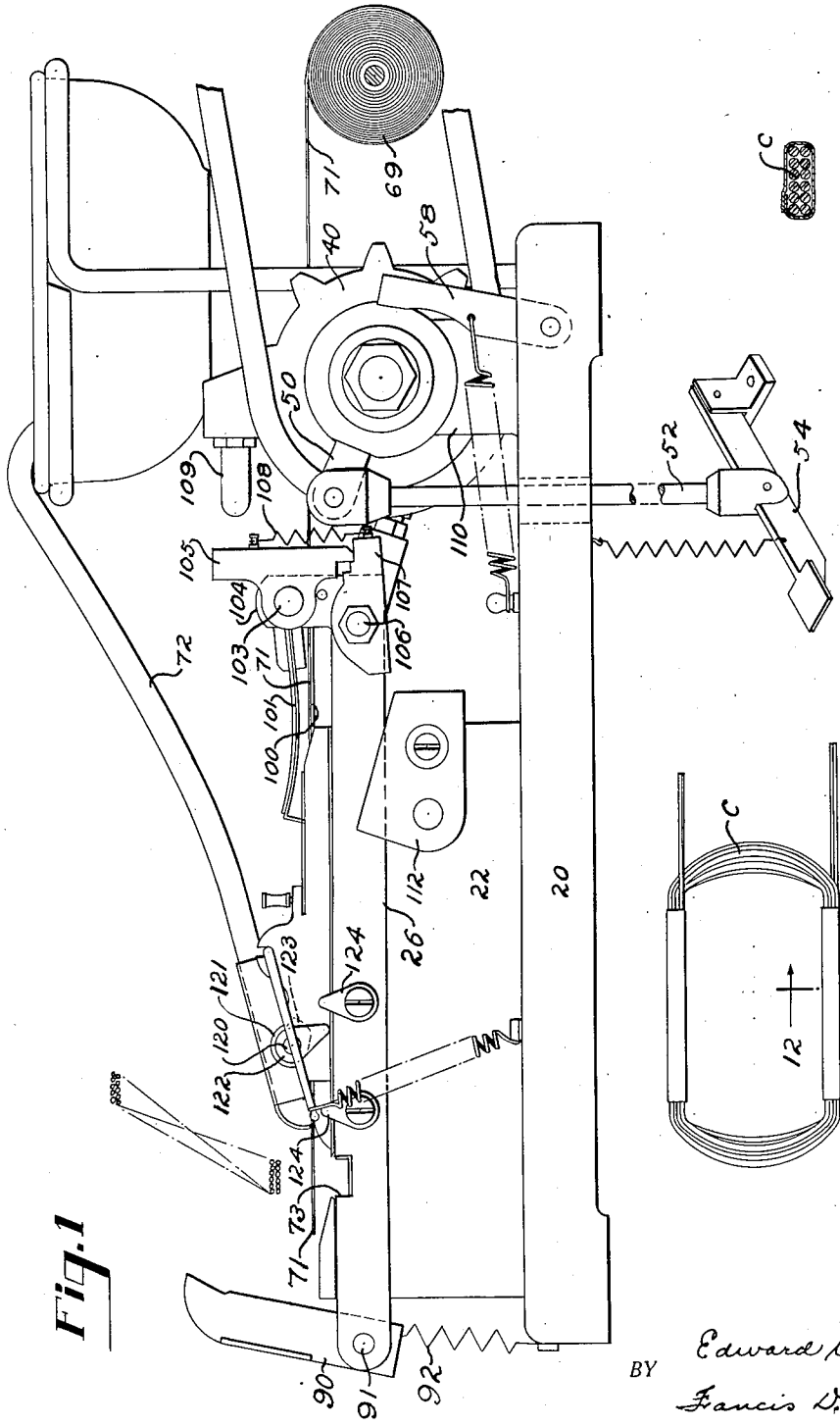


Fig. 1

Fig. 12

Fig. 11

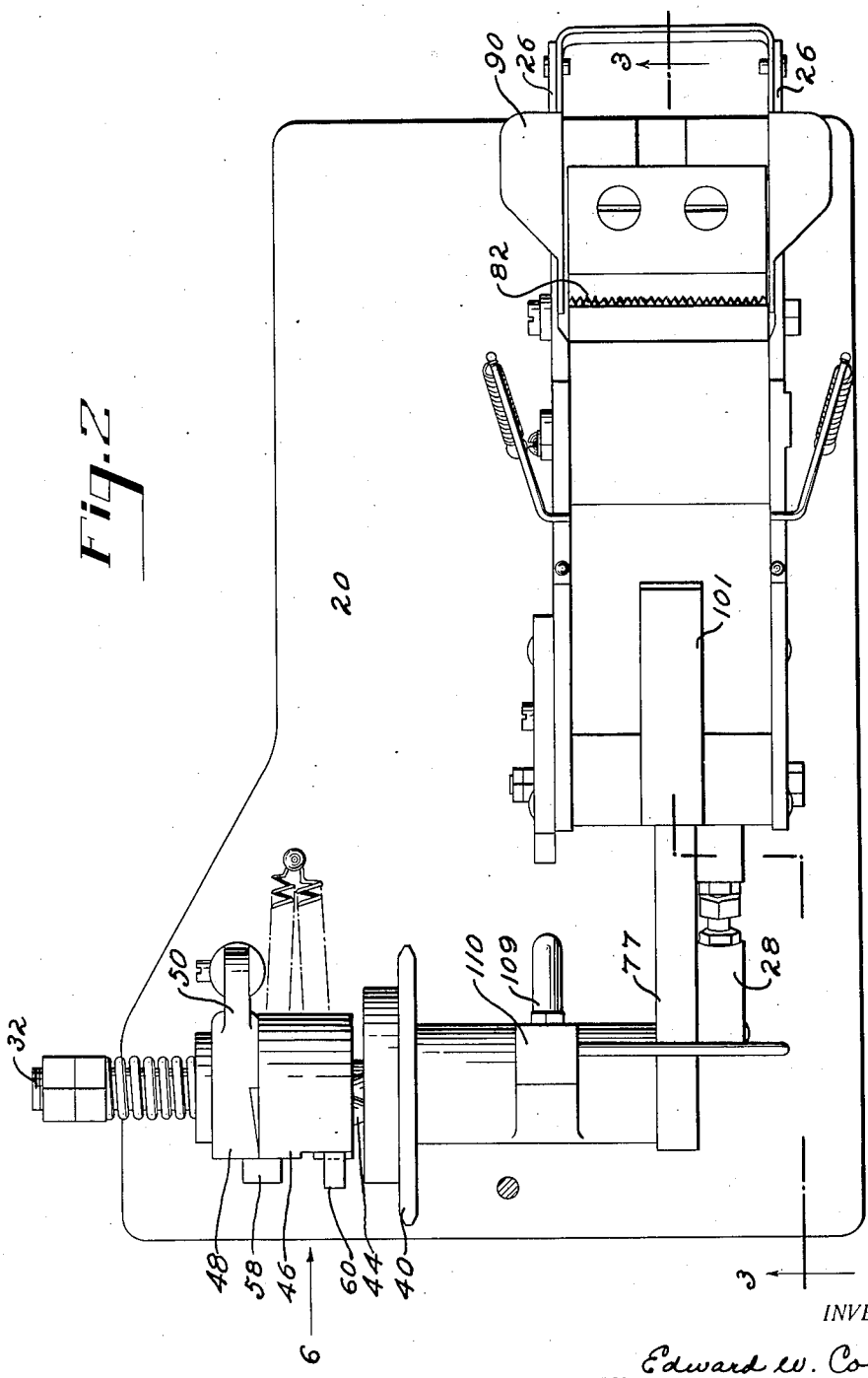
INVENTOR.
Edward W. Collins
BY
Francis D. Hardesty
ATTORNEY.

Nov. 27, 1934. E. W. COLLINS 1,981,946

COIL WRAPPING MACHINE

Filed Oct. 19, 1931 4 Sheets-Sheet 2

Fig. 2



INVENTOR.

BY Edward W. Collins

Francis D. Hardesty

ATTORNEY.

Nov. 27, 1934. E. W. COLLINS 1,981,946

COIL WRAPPING MACHINE

Filed Oct. 19, 1931 4 Sheets-Sheet 3

Fig. 3

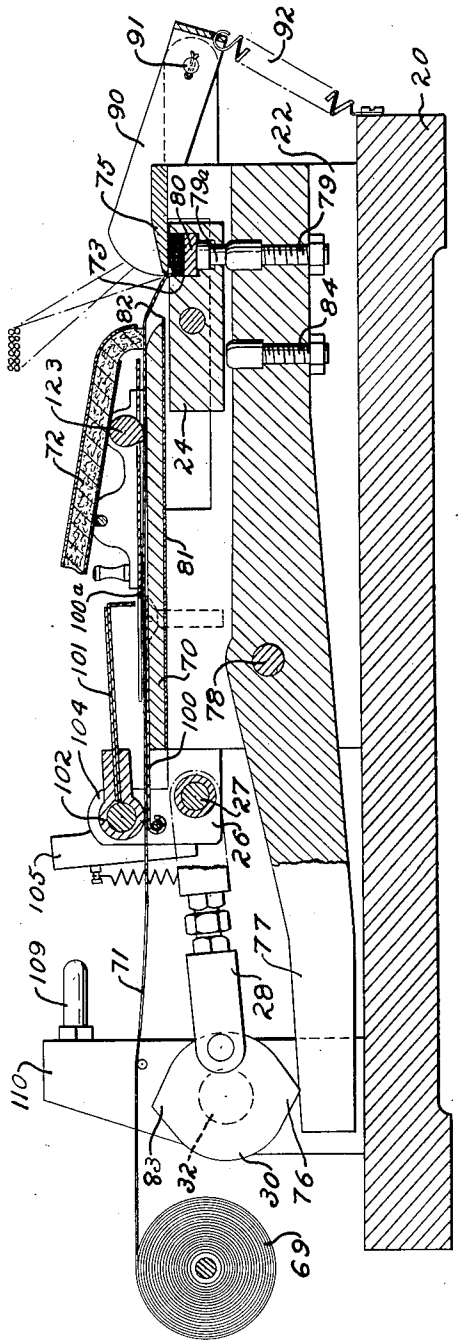


Fig. 4

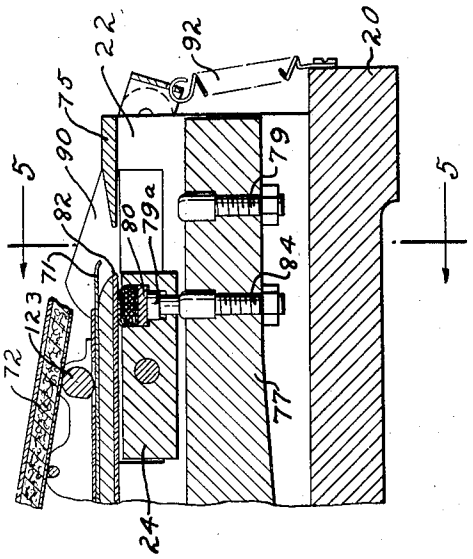
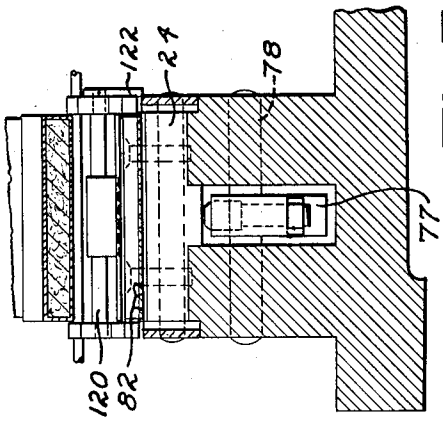


Fig. 5



INVENTOR.
Edward W. Collins
BY Francis D. Hardesty
ATTORNEY.

Nov. 27, 1934. E. W. COLLINS 1,981,946

COIL WRAPPING MACHINE

Filed Oct. 19, 1931 4 Sheets-Sheet 4

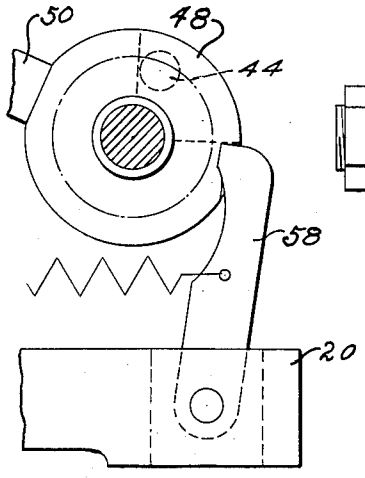


Fig. 7

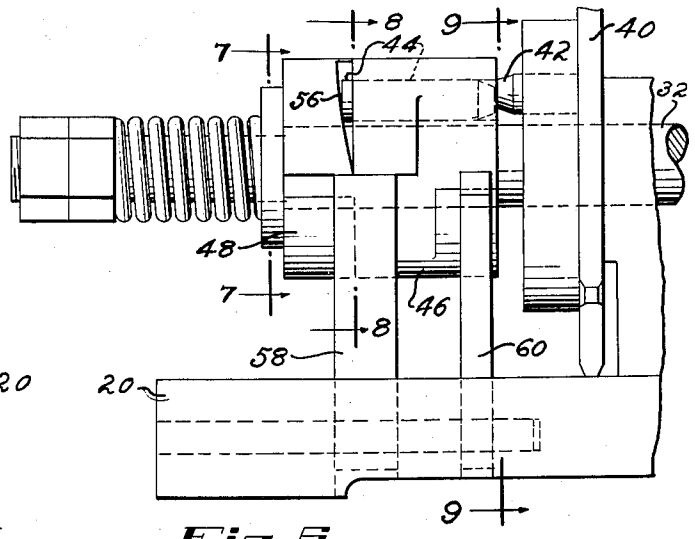


Fig. 6

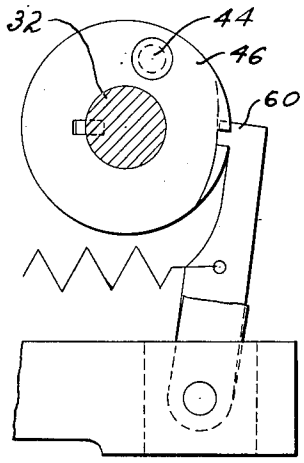


Fig. 8

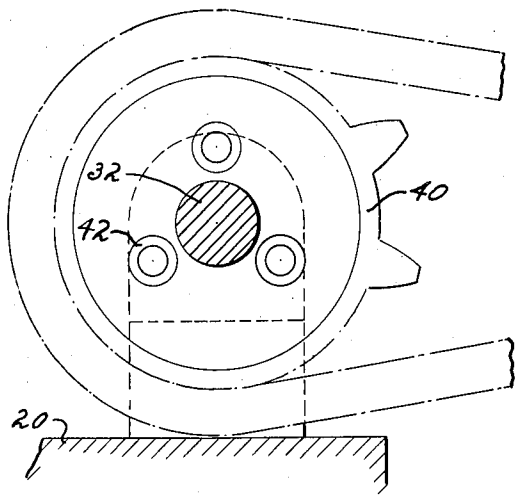


Fig. 9

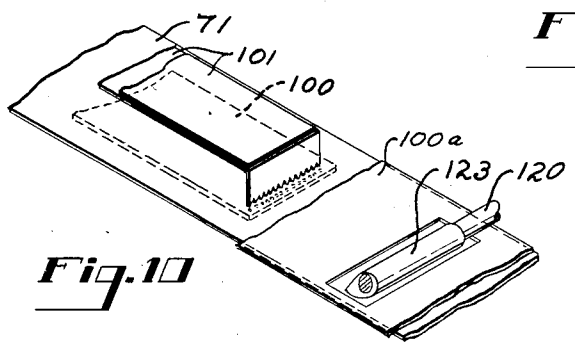


Fig. 10

INVENTOR.
Edward W. Collins
BY Francis D. Hardesty.
ATTORNEY.

Patented Nov. 27, 1934 1,981,946

UNITED STATES PATENT OFFICE

1,981,946

COIL WRAPPING MACHINE

Edward W. Collins, Detroit, Mich., assignor, by mesne assignments, to General Motors Corporation, Detroit, Mich., a corporation of Delaware

Application October 19, 1931, Serial No. 569,679

14 Claims. (Cl. 216—28)

This invention relates to the manufacture of coils and more particularly to the wrapping of short strips of paper around the active sides of form wound coils.

It is an object of the present invention to provide a coil wrapping machine which is simple in construction, reliable in operation, and economical of manufacture, and which is an improvement upon the wrapping machine disclosed in the patent to Jasper F. Cullin No. 1,380,531, June 7, 1921.

It is a further object of the present invention to provide a power driven, manually controlled machine having novel details of construction, especially in the paper feeding and locking mechanism.

Still further objects and advantages will readily occur to those skilled in the art upon reference to the following description and the accompanying drawings in which

Fig. 1 is a side elevation of the improved machine,

Fig. 2 is a plan view of the machine.

Fig. 3 is a longitudinal sectional view of the machine taken on the line 3—3 of Fig. 2.

Fig. 4 shows an end portion of Fig. 3, however, certain parts being shown in a different position.

Fig. 5 is a section taken on the line 5—5 of Fig. 4.

Fig. 6 is an enlarged view of the clutch of the machine, looking in the direction of arrow 6 in Fig. 2.

Figs. 7, 8 and 9 are sectional views taken on the lines 7—7, 8—8 and 9—9, respectively, of Fig. 6.

Fig. 10 is a perspective view of a detail of the paper feeding and locking mechanism.

Fig. 11 shows a coil the active sides of which are wrapped with paper.

Fig. 12 is a section taken on the line 12—12 of Fig. 11.

The prior art machine and the present machine are similar, both including a horizontally slidable carriage above which passes gummed paper to be moistened and wrapped around one active side of a coil C, which side is of rectangular cross-section. This active coil side is deposited in the machine by the operator who urges said coil side against the strip of gummed paper near the end of the latter and into a transverse groove in the carriage. The carriage advances from a coil receiving position in order to fold the end of the paper over a portion of said coil side, then retracts beyond the coil receiving position in order to sever a sheet of paper from the strip and to fold this severed paper strip over the remaining portion of the coil side, and then advances into coil receiving position in order to free the wrapped coil side for removal and to receive another coil side to be wrapped.

In the prior art machine, the carriage was moved manually, whereas the present machine provides power means for moving the carriage.

The present machine furthermore provides means for locking the paper positively against movement during carriage retraction, whereas the prior art machine provided no such means.

The present machine is furthermore provided with a construction of the paper feeding means.

It will be seen, therefore, that the principal features of the present machine reside in the power drive of the carriage, the construction of the paper feeding means, and the construction of the paper locking means.

The present machine includes a suitably supported bed 20 upon which are disposed the various operating parts of the machine. Mounted upon the bed is a machine base 22 upon which slides a carriage 24 which is connected by means of links 26 whose ends are kept properly spaced by a tie rod 27 and a longitudinally adjustable connecting rod 28, to a crank disc 30 on a cam shaft 32. Rotation of the shaft therefore causes advancing and retracting movements of the head 24.

The drive

Loosely mounted on the cam shaft 32 is a continuously rotating chain driven sprocket wheel 40 having equi-angularly spaced projecting pins 42 which are adapted to engage a pin 44, longitudinally slidably carried by a shaft collar 46 and keyed to shaft 32, thereby to rotate the latter and the cam shaft (see Fig. 6). Driving pin 44 is moved into the path of movement of pins 42 by a cam disc 48, having a cam surface 56 and being loosely mounted on cam shaft 32. Cam disc 48 is provided with an arm 50 (see Figs. 1 and 2), pivotally connected to an operating link 52 which passes thru the bed 20 and which is connected to a foot pedal 54. Actuation of the foot pedal by the operator causes pin 44 to be thrust into the path of movement of the pins 42 on the sprocket wheel 40 as can be readily understood.

Pivotally mounted spring urged links 58 and 60 (see Figs. 7 and 8) lock cam disc 48 and collar 46, respectively, acting therefore as positive stop locks for the shaft 32 by intermediation of collar 46. It is therefore obvious that upon actuation

of the foot pedal 54 by the operator shaft 32 will make one complete revolution and no more, the locking links 58 and 60 positively locking cam disc 48 and collar 46, respectively, at the completion of one revolution.

The carriage

Unreeled from a spool 69 and passed over a stationary plate 70 above the base and the carriage 24 is a strip of gummed paper 71 having its gummed surface moistened by a moistening felt pad 72, suitably mounted and resiliently urged towards the gummed surface of the paper (see Fig. 3). One end of the felt pad is immersed in water contained in a suitable container which is supported in any suitable manner by a bracket mounted on the bed 20.

When the operation of coil side wrapping is to commence, the carriage 24 is in coil receiving position in which its transverse groove or slot 73 which is in alignment with transverse slots in the bars 26 assumes the position shown in Fig. 1. The paper at this time has its free and moistened end disposed slightly beyond the slot 73 as best shown in Fig. 1. The operator urges a coil side against the paper and into the transverse groove 73, and then actuates the foot pedal. Shaft 32 commences to rotate and advances carriage 24 toward the adjacent end of the machine, whereby the end of the paper is folded over the coil side and disposed between said coil side and a stationary plate 75. At this time a high spot 76 on crank disc 30 engages a bar 77, which is pivotally mounted on base 22 as at 78, and tilts said bar counterclockwise as viewed in Fig. 3, thereby causing a screw pin 79 carried by bar 77 to press against an aligned pin 79*a*, longitudinally movable in carriage 24 and a cross bar 80, guided for movement parallel to the direction of movement of pin 79*a* in a slot 73 of the carriage, such pressure of the cross bar 80 tending to press the paper firmly against the coil side to insure proper binding of the gummed paper to the coil side.

The carriage is then retracted into the position shown in Fig. 4, whereby the coil side in the carriage groove 73, together with a portion of the paper is moved underneath a sheet metal blade 81, secured in any suitable manner to stationary plate 70. As the paper crosses over the serrated edge 82 of this sheet metal blade during such retracting movement of the carriage, a sheet of paper, part of which is already wrapped around part of the coil side, is torn loose from the paper resting on plate 70. Continued retracting of the carriage causes the torn sheet of paper to be folded above the first flap, which had been folded down during the earlier described advance stroke.

At this time, another high spot 83 on crank disc 30 causes bar 77 to tilt counterclockwise as viewed in Fig. 3, in order to cause a screw pin 84, carried by bar 77 to press against pin 79*a* and cross bar 80 in order to press the last flap of paper firmly against the coil side.

Continued rotation of shaft 32 then advances the carriage into coil receiving position where the wrapped coil may be removed from between the stationary plates 70 and 75.

In order to clamp the coil side into the carriage groove 73, before it is moved under the stationary plates 75 and 70, a clamping yoke 90, pivotally mounted at 91 on the carriage links 26 and normally urged into the position shown in Fig. 1 by a tension spring 92, may be turned clockwise as viewed in Fig. 1 by the operator as he places a coil side into the carriage groove 73.

Paper feeding and locking means

An important feature of the present machine is the improved means for feeding the paper forwardly while the carriage is being advanced from the position shown in Fig. 4 to the coil receiving position shown in Fig. 1. Such means, disclosed best in Figs. 1, 3 and 10, include a plate 100 (Fig. 3), which is carried by the carriage. The paper passes between said plate 100 and stationary spaced plate 100*a*. A leaf spring 101 normally urges the paper against plate 100, said leaf spring being attached to a collar 102, mounted on a cross bar 103 which is journalled in leg portions 104 of the carriage links 26.

Pivotally mounted on one of said carriage links 26 as at 106 is a locking plate 107, connected by a tension spring 108 to a bell crank lever 105. When the carriage assumes the position shown in Fig. 4, bell crank lever 105 is rocked into the position shown in Fig. 1 by a stationary pin 109, which is secured to a pedestal 110 mounted on base 20, and is locked in that position by the engagement of a shoulder of said bell crank lever with a shoulder of locking plate 107 and held in such locking relationship by spring 108. Consequently when bell crank lever 105 is thus locked, considerable pressure is exerted by leaf spring 101 against the paper, which is thereby firmly clamped against plate 100.

As the carriage advances toward coil receiving position, the locking plate 107 is engaged by a stationary cam plate 112 attached to the machine base 22 and is rocked clockwise as viewed in Fig. 1. Such rocking motion of the locking plate causes separation of bell crank lever 105 from the locking plate and hence relief of pressure exerted by spring leaf 101 against the paper which is then free to slide along the plates 100 and 70. Cam plate 107 is of such shape and so arranged that when the carriage has reached coil receiving position, locking plate 107 has been rotated a considerable amount, enough to permit spring 108 to draw bell crank 105 and leaf spring 101 entirely out of engagement with the paper.

When the carriage advances from coil receiving position into that shown in Fig. 3, the paper does not move with the carriage but is held stationary by locking means to be described, so that the foremost end of the paper may be tucked under the plate 75 and folded around the coil, as previously described.

When the carriage is retracted from the position shown in Fig. 3, the paper is still stationary due to the fact that the leaf spring 101 is no longer in contact with the paper, the leaf spring being locked out of contact with the paper by the engagement of another shoulder of the locking plate 107 with the shoulder of the bell crank lever 105. The carriage is therefore retracted from the position shown in Fig. 3 without affecting the position of the paper, with the exception of the cut off part which is being tucked under the stationary plate 70 to be folded against the coil side as previously explained. The carriage continues to retract until bell crank lever 105 is engaged by the stop 109, whereupon leaf spring 101 will be depressed and engage the paper once more. The very next motion of the carriage into coil receiving position, will cause forward feeding of the paper for the next wrapping operation.

Figs. 1 and 10 show a cross bar 120, journalled in the stationary parts 121 of a moistening felt

pad holder, which is provided with a crank 122 and a cam bar 123 above the paper strip. The crank is adapted to be engaged by one or the other of two lugs 124 projecting from one of the carriage links 26 and thereby shifted either into paper clamping or paper released position. It is obvious that neither of the lugs passes beyond the crank, but that they merely shift the cam bar from one extreme position into another extreme position.

While the form of embodiment of the present invention as herein disclosed, constitutes a preferred form, it is to be understood that other forms might be adopted, all coming within the scope of the claims which follow.

What is claimed is as follows:

1. In a wrapping machine, a movable wrapping carriage having a groove for receiving an article and a portion of a wrapper partly wound around the article; two stationary spaced plates adapted to cooperate with the article in the moving carriage groove to fold the loose ends of the wrapper onto the article; a drive shaft; a crank on the shaft for reciprocating the carriage; a pivotally mounted bar for forcing the article and a folded wrapper end against a plate at the end of each stroke of the carriage; and means on the shaft for causing rotary movements of the bar.

2. In a wrapping machine, a movable wrapping carriage having a groove for receiving an article and a portion of a wrapper partly wound around an article; two stationary spaced plates adapted to cooperate with the article in the moving carriage groove to fold the loose ends of the wrapper onto the article; a drive shaft; a pivotally mounted bar for forcing the article and a folded wrapper end against a plate at the end of each stroke of the carriage; and a member on said shaft for reciprocating the carriage and for causing rotary movements of the bar.

3. In a wrapping machine, a movable wrapping carriage having a groove for receiving an article and a portion of a wrapper partly wound around the article; two stationary spaced plates adapted to cooperate with the article in the moving carriage groove to fold the loose ends of the wrapper onto the article; a drive shaft; a crank on the shaft having a cam shaped periphery; a linkage connecting the crank with the carriage; and a pivotally mounted bar cooperating with the cam shaped periphery of the crank adapted to be turned thereby in order to force the article and a folded wrapper end against a plate at the end of each stroke of the carriage.

4. In a wrapping machine, the combination of a reciprocable carriage having a groove for receiving an article and a portion of a wrapper partly wound around the article; two stationary spaced plates adapted to cooperate with the article in the carriage groove to fold the loose ends of the wrapper onto the article; a drive shaft; a crank on the shaft for reciprocating the carriage; a pivotally mounted bar for forcing the article and a folded wrapper end against a plate; cams on the shaft for causing rotary movements of the bar; a driving wheel; manually operable means for clutching the shaft to the wheel; and means for automatically releasing the shaft from the wheel at the end of each revolution of the shaft, said shaft during each revolution causing the carriage to advance partially, retract fully, and again advance partially, and also causing one end of the bar to be raised and lowered twice.

5. In a wrapping machine, the combination of means including a reciprocable carriage for wrapping a strip of flexible material around an article; a plate movable with the carriage for supporting a supply of wrapping material; a device for clamping the wrapping material to the plate; and means responsive to movement of the carriage through a preassigned cycle for actuating said device.

6. In a wrapping machine, the combination of means including a reciprocable carriage for wrapping a strip of flexible material around an article; a plate movable with the carriage for supporting a supply of wrapping material; means also movable with the carriage to clamp the wrapping material to the plate; stationary means causing the clamping means to become effective at the end of a predetermined cycle of movement of the carriage; and a second stationary means causing the clamping means to become ineffective at the end of another predetermined cycle of movement of the carriage.

7. In a wrapping machine, the combination of means including a reciprocable carriage for wrapping a strip of flexible material around an article; a plate movable with the carriage for supporting a supply of wrapping material; means also movable with the carriage to clamp the wrapping material to the plate; stationary means causing the clamping means to become effective at the end of a predetermined cycle of movement of the carriage and to remain effective; and a second stationary means causing the clamping means to become ineffective at the end of another predetermined cycle of movement of the carriage and to remain ineffective.

8. In a wrapping machine, the combination of means including a reciprocable carriage for wrapping a strip of flexible material around an article; a stationary plate for supporting a supply of wrapping material; means movable with the carriage to feed the wrapping material over the plate during a certain cycle of movement of the carriage; and means responsive to a predetermined cycle of movement of the carriage other than said certain cycle for clamping the wrapping material to the plate.

9. In a wrapping machine, the combination of means including a reciprocable carriage for wrapping a strip of flexible material around an article; a stationary plate for supporting a supply of wrapping material; means movable with the carriage to feed wrapping material over the plate during a predetermined cycle of movement of the carriage; means for relieving the wrapping material of the feeding means during another cycle of movement of the carriage; and means to clamp the material to the plate during a part of said other cycle of movement of the carriage.

10. In a wrapping machine, the combination of means including a reciprocable carriage for wrapping a strip of flexible material around an article; a stationary plate for supporting a supply of wrapping material; means movable with the carriage to feed the wrapping material over the plate during a certain cycle of movement of the carriage; means responsive to said completed cycle of movement of the carriage for relieving the wrapping material of the feeding means; and means to clamp the material to the plate during another predetermined cycle of movement of the carriage.

11. In a wrapping machine, the combination of means including a reciprocable carriage for wrapping a strip of flexible material around an

article; a stationary plate for supporting a supply of wrapping material; means movable with the carriage to feed the wrapping material over the plate during a certain cycle of movement of the carriage; means actuated in response to said completed cycle of movement of the carriage for relieving the wrapping material of the feeding means; and means actuated in response to another cycle of movement of the carriage for clamping the wrapping material to the plate.

12. In a wrapping machine, the combination of means including a reciprocable carriage for wrapping a strip of flexible material around an article; a stationary plate for supporting a supply of wrapping material; means movable with the carriage to feed the wrapping material over the plate during a certain cycle of movement of the carriage; and means responsive to a predetermined cycle of movement of the carriage other than said certain cycle for clamping the wrapping material to the plate, and responsive to said completed predetermined cycle of movement of the carriage for releasing the wrapping material from the plate.

13. In a wrapping machine, the combination of means including a reciprocable carriage for wrapping a strip of flexible material around an article; a stationary plate for supporting a supply of wrapping material; means movable with the carriage to feed the wrapping material over the plate during a certain cycle of movement of the carriage; means actuated in response to said completed cycle of movement of the carriage for relieving the wrapping material of the feeding means; and means responsive to a predetermined cycle of movement of the carriage other than said certain cycle for clamping the wrapping material to the plate, and responsive to said completed predetermined cycle of movement of the carriage for relieving the wrapping material of the clamping means.

14. In a wrapping machine, the combination of means for wrapping a sheet of flexible material around an article, said means including stationary members and a reciprocable member receiving the article; a wrapping material supply reel; a first stationary plate for supporting unreeled wrapping material and guiding the same to the wrapping means; a second plate carried by one of said stationary members and having a serrated edge in close proximity to the unreeled wrapping material, said material being moved into engagement with said serrated edge and severed thereby upon movement of the reciprocable member through a predetermined cycle; and a turnable cam bar extending across the first plate and operable to clamp the unreeled material to said first plate in order to prevent slipping of the material during the severing thereof.

EDWARD W. COLLINS.