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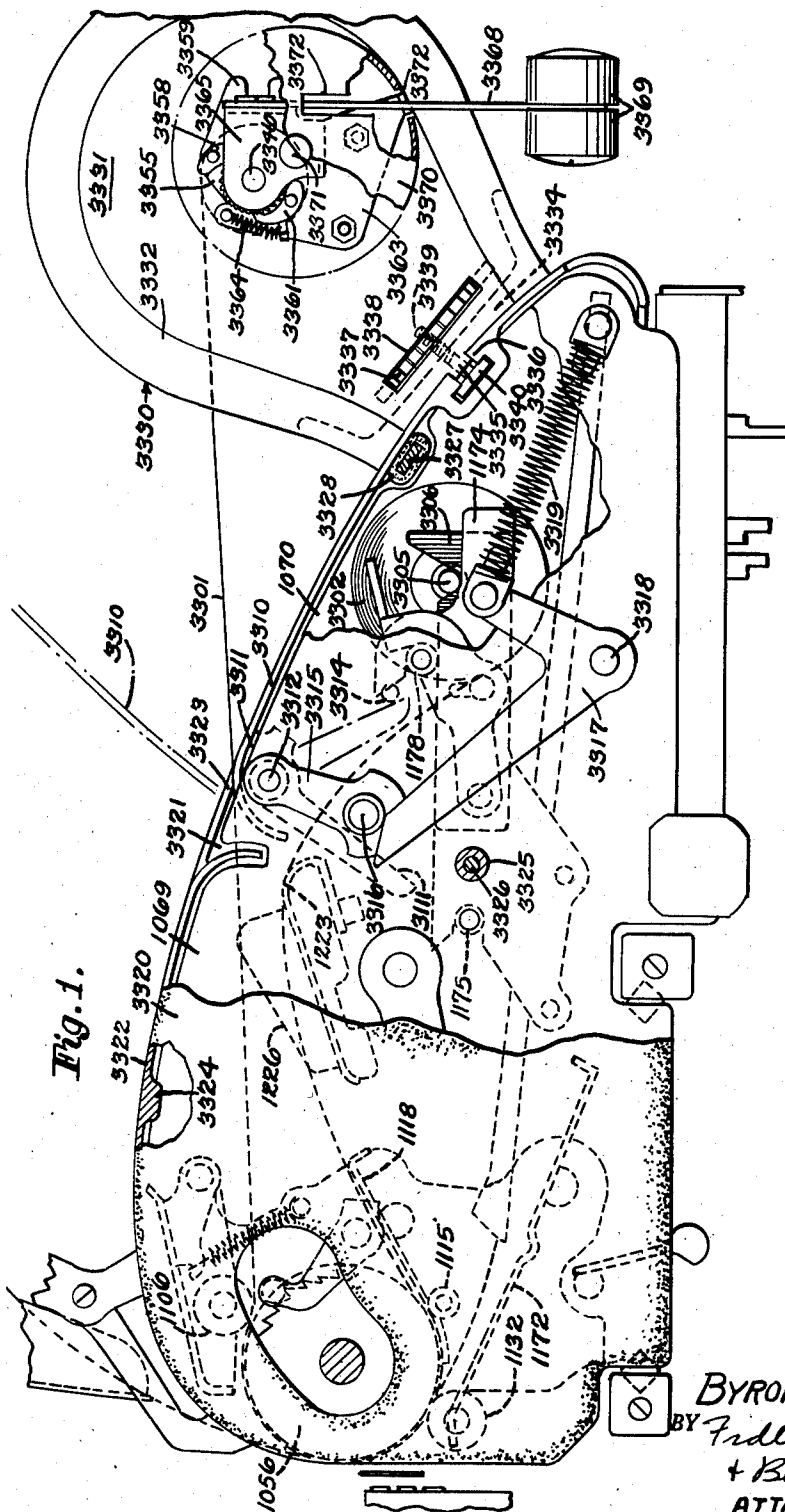
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ROLL PAPER REWINDING MEANS FOR BUSINESS MACHINES

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2 Sheets-Sheet 1



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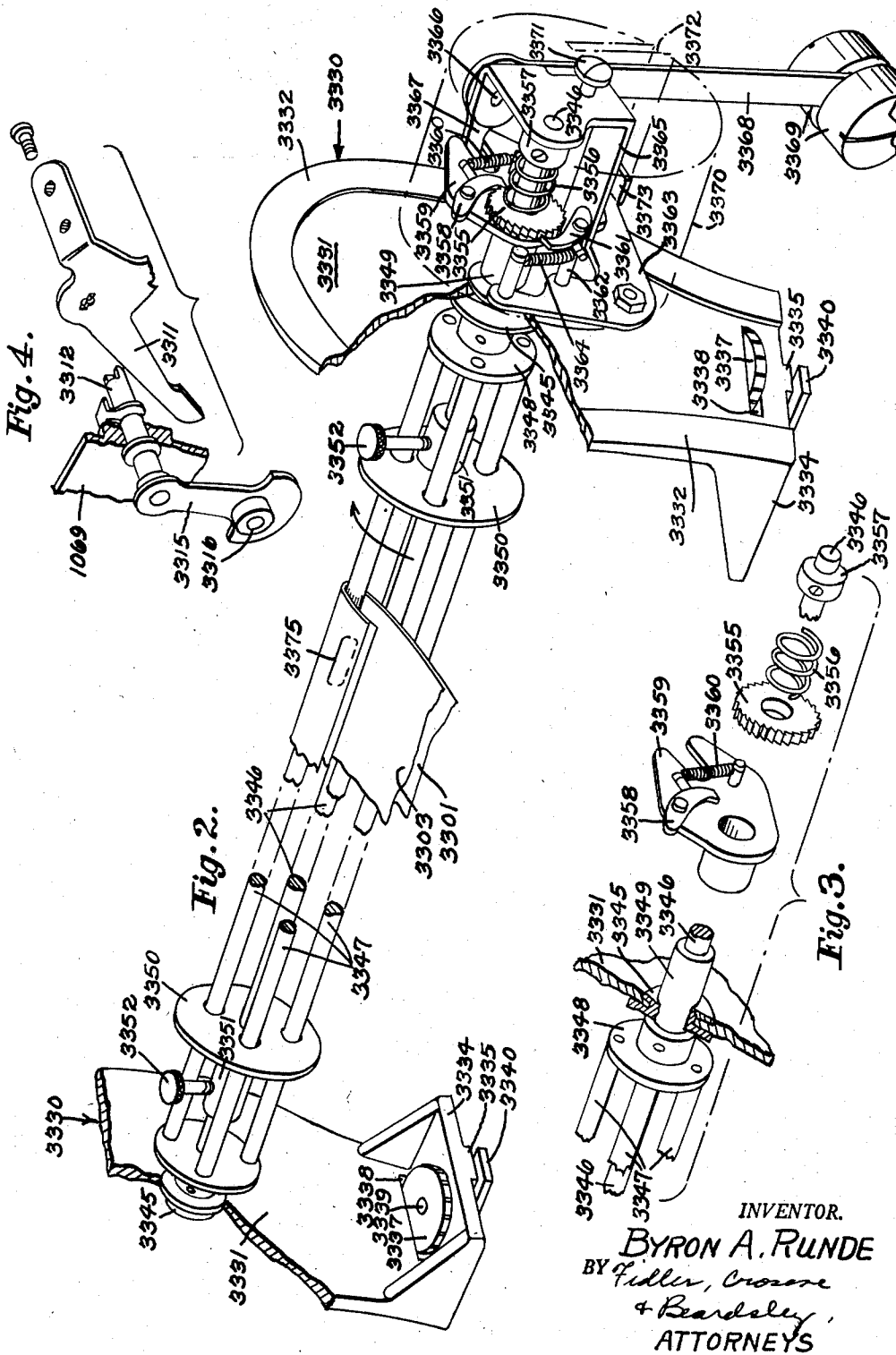
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ROLL PAPER REWINDING MEANS FOR BUSINESS MACHINES

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10 Claims. (Cl. 197—133)

This invention relates to improvements in roll paper rewinding means for printing business machines having intermittently laterally moving paper carriages.

An object of the invention is to provide a compact, automatically driven, roll paper rewinding device which is readily and conveniently detachably securable to the traveling paper carriage of a printing business machine such as an accounting or bookkeeping machine.

A further object of the invention is to provide a roll paper rewinding means for a business machine having a movable paper carriage and means to intermittently move said carriage, which rewinding means is readily mountable on the paper carriage and, solely by reason of being mounted on said carriage and movable therewith, is automatically powered by said carriage moving means.

A further object is to provide a self-contained, roll paper rewinding means including an inertia actuated drive means.

Further objects and advantages of the invention will be apparent from the following description and the accompanying drawings in which:

Fig. 1 is a right side elevation of a preferred form of the invention applied to the traveling paper carriage of an accounting machine with portions broken away to reveal internal structure.

Fig. 2 is a perspective of the paper rewinding means of Fig. 1.

Fig. 3 is an exploded perspective of portions of the rewind drive means; and

Fig. 4 is an exploded perspective of a mounting hinge for the carriage cover panel carrying the rewinding means.

The drawings show the invention as applied, by way of example, to the paper carriage of an accounting machine of the kind shown in Patent No. 2,629,549 of Thomas M. Butler, the illustrated paper carriage being substantially the same as that of the Butler patent except as hereinafter indicated, and intermittently moved in the tabulating and return directions across the machine as disclosed in said patent. Those elements of the machine of the Butler patent which are shown in the accompanying drawings and referred to hereinafter are identified by the same reference numerals, below 2600, by which they are designated in the patent, whereas new elements disclosed herein are designated by reference numerals above 3300.

The invention may be employed for rewinding roll paper 3301 after it has passed around the platen roller 1056 (Fig. 1) from a supply roll 3302. The record may be a continuous journal, a tally or proof or other record strip but, for convenience, will be referred to hereinafter as a journal. When the data recorded on the journal 3301 is wholly or partly "carbon" copy of entries printed by the machine on papers, such as ledger and statement forms, front-fed into the carriage in overlying relation to the journal paper 3301 passing around the platen, a "carbon" web 3303 (Fig. 2) will overlie the journal paper 3301 and may be supplied interwound with

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the journal paper in the supply roll 3302. Such "carbon" paper may be torn off in short lengths after it emerges rearwardly from above the platen or it may be rewound together with the journal paper 3301 for later separation therefrom and possible re-use.

The journal supply roll 3302 is carried on a rod 3305 (Fig. 1) supported at its ends in V notches in the upper edges of small plates 3306 secured to the inward faces of two small vertical plates 1174 of a rear paper guide assembly readily detachably supported on the ends of studs 1175 and 1178 secured to and extending inwardly from the carriage frame side plates 1069 and 1070.

The journal rewind means is detachably carried on the upper side of a carriage casing cover panel 3310 which extends transversely between the rear portions of the carriage frame side plates 1069 and 1070, covering the rear portion of the carriage and the journal supply roll 3302. At each side, just rearwardly of its down-turned front edge, the cover panel 3310 is secured upon the inwardly bent upper arms of a pair of levers 3311 (Figs. 1 and 4), only the rightward one of which is shown. The downwardly extending portions of the levers 3311 are formed with keyed openings (Fig. 4) fitting over complementarily keyed reduced inner ends of short shafts 3312 to which they are secured by the heads of screws threaded into the inner ends of said shafts. The shafts 3312 extend through journal bushings secured in the plates 1069 and 1070 and have, outwardly of said plates, enlarged portions which bear against the outer faces of said bushings. A reduced outer end portion of each shaft 3312 is spun into the upper end of an arm 3315, the lower end of which carries a roller stud 3316 engaged by a detent cam portion of the forward arm of a bell crank lever 3317 pivotally supported on a stud 3318 secured in the respective plate 1069 or 1070. The bell cranks 3317 are urged clockwise by tension springs 3319 connected between the rear arms of said bell cranks and studs secured in the respective plates 1069 and 1070.

When the hinged cover panel 3310 is in lowered closed position as shown in Fig. 1, the forwardly inclined portion of the cam edge of the forward arms of the bell cranks 3317 is pressed against the roller 3316 to yieldingly hold the panel 3310 in closed position, but when the panel is swung counter-clockwise from its closed position of Fig. 1, the roller 3316 cams the bell crank 3317 counterclockwise slightly as the roller passes the apex of said cam edge, after which the springs 3319 return the bell cranks 3317 clockwise, pressing the rollers 3316 rearwardly and the arms 3315 and shafts 3312 counterclockwise to hold the cover panel 3310 yieldingly in its raised open position to permit insertion of a roll of journal paper and the threading thereof around the platen 1056. Opening movement of the hinged panel 3310 is stopped at the position indicated in dot-dash lines in Fig. 1 by engagement of the downward arms of the levers 3311 against studs 3314 projecting inwardly from the carriage frame side plates 1069 and 1070.

To enclose the above-mentioned detent devices located on the outer sides of the carriage frame end plates, the small casing side members covering the central portions of the outer sides of the carriage frame end plates 1069 and 1070 in the Butler patent (and there numbered 83) are replaced by larger side casing members 3320 and 3321, each having a peripheral inwardly turned flange 3322 and 3323 respectively, abutting against the outer face of the respective carriage frame end plate 1069 or 1070 along lower edge of the latter and extending across and inwardly beyond the remainder of the edge of said plate. Stops 3324 on each casing side member abut against the outer face of the respective plate 1069 or 1070 at its upper edge. Each casing member 3320 or 3321 is secured to the respective plate 1069 or 1070

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by a headed screw 3325 passing through the end plate from the inward side thereof and threaded into a spacing boss 3326 extending inwardly from the inner side of the casing member.

The edge of the rearward upper portion of the in-turned flange 3322 or 3323 of each side casing member is flush with and substantially meets the respective side edge of the hinged cover panel 3310 except at the downwardly turned front edge of the latter and has a lug 3327 bent first downwardly and then inwardly and provided with sleeve 3328 of rubber or other resilient cushioning material to stop and support the rearward portion of the cover panel when the latter is lowered to closed position. A further inwardly extending portion of the flange 3322 or 3323 of each side casing cover member forwardly of the hinged cover panel 3310 is turned down adjacent the front end of the cover panel.

The rewinding means is supported on the rearward portion of the hinged panel 3310 by a pair of standards 3330 preferably formed of molded plastic and each comprising an upright plate portion 3331 substantially flat except for a thickened reinforcing margin 3332 and a laterally inwardly extending foot portion 3334 having on its lower face a laterally extending rib 3335 extending a short way into the upwardly open narrow part of an inverted T-section slot 3336 (Fig. 1) formed in the rear portion of the hinged panel 3310 and extending from side to side thereof. The remainder of the lower face of the foot portion 3334 conforms to the curvature of the upper face of the hinged panel adjacent the slot 3336. A knurled nut 3337 of large diameter, part of which extends through a slot 3338 in the standard 3330 to make a portion of its knurled circumferential edge accessible at the outer side of the standard, is threaded onto the free end of a screw 3339 which passes freely through a hole in the foot portion 3334 and is secured at its other end to rectangular key-plate 3340 having a free sliding fit in the wide bottom portion of the inverted T-slot 3336. After inserting the key-plates 3340 into the slot 3336, the standards 3330 may be shifted transversely across the rear top of the hinged panel 3310 to the desired positions where they may be readily secured by rotating the knurled nuts 3337 to pull up the screws 3339 and key-plates 3340.

In about the center of the upright portion 3331 of each standard there is a bearing bushing 3345 (Figs. 2 and 3) having at one end an enlarged diameter flange abutting one side face of the standard and spun into a collar tightly engaging the opposite side face of the standard. The two bearing bushings 3345 rotatably support a rewinding spindle comprising a shaft 3346 and a plurality of rods 3347 secured at their ends in a pair of circular plates 3348 having axially outwardly extending, shouldered hubs 3349 pinned to the shaft 3346. The portions of said hubs 3349 of the lesser diameter are rotatably supported in the bearing bushings 3345, and such smaller diameter portion of the rightward one of the hubs 3349 extends considerably beyond the outer side of the rightward bearing bushing 3345. The rewinding spindle is also provided with a pair of adjustable paper edge guides each comprising a circular plate 3350 with a hub 3351 axially slidably fitted on the shaft 3346. Each guide plate 3350 has apertures freely passing the rods 3347. After adjustment of the guide plates 3350 along the spindle to suit the width and position of the paper web to be wound thereon, the guide plates may be secured in axially adjusted position by means of thumb screws 3352 threaded into tapped holes extending through the hubs 3351 into the axial bores therein.

The right hand end portion of the shaft 3346 extends substantially beyond the rightward end of the rightward hub 3349 and freely rotatably supports a ratchet wheel 3355 which is pressed into frictional driving engagement with the end of said hub 3349 by a helical spring 3356 compressed between the ratchet wheel 3355 and a col-

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lar 3357 adjustably secured on the end portion of the shaft 3346 by means of a set screw. The toothed periphery of the ratchet wheel 3355 cooperates with a drive pawl 3358 pivoted on a stud carried by a lever 3359 having a hub freely rotatable on the projecting portion of the right hand hub 3349 between the ratchet wheel 3355 and the right hand bearing bushing 3345. The drive tooth of the pawl 3358 is yieldingly pressed against the toothed periphery of the ratchet wheel 3355 by a tension spring 3360 connected between a stud on the pawl and a stud secured in the lever 3359. A check pawl 3361 also cooperating with the teeth of the ratchet wheel 3355 is pivoted on the end of a stud 3362 secured to a bracket 3363. Its check tooth is pressed against the ratchet by a tension spring 3364 connected between a stud secured in the check pawl 3361 and another stud carried by the bracket.

The bracket 3363 has a portion secured flat against the rightward face of the right hand standard 3330 by screws and nuts and has an arm 3365 which extends first rightwardly and then upwardly. The upwardly extending portion of the arm has a hole freely fitting the rightward end of the shaft 3346. It also has, at its rear edge, a lug bent leftwardly and carrying a stud 3366 on which is pivoted a bell crank having a leftward arm 3367 loosely engaging in a slot in the lever 3359 and a downward arm 3368 having on its lower end a weight 3369 formed of a large headed screw passing through a hole in the arm 3368 and threaded into a large cap nut.

The just-described inertia actuated drive mechanism, except for the weight 3369 and arm 3368, is enclosed in a generally cylindrical casing 3370 held with its open end edge against the standard 3330 by means of a headed screw 371 passing through the closed end of the casing 3 and threaded into the upright part of the bracket arm 3365. The casing 3370 has a slot 3372 to permit free oscillation of the arm 3368, said slot being maintained in proper alignment with the arm 3368 by a lug 3373 of the bracket 3363 engaging in the open end of said slot.

The paper web 3301 drawn forwardly over and between the journal guides 1223, 1226, from the supply roll 3302 with or without a "carbon" web 3303 may be threaded forwardly under, upwardly in front of and rearwardly over the platen 1056, between the latter and several sets of pressure rollers and guides 1106, 1115, 1118, 1132, 1172, etc., in the manner explained in the Butler patent. The free end of the web or webs 3301 or 3301 and 3303 may be drawn rearwardly and passed around one of the rods 3347 to which it or they may be secured in any suitable manner as by means of a staple 3375, a pin or a bit of pressure sensitive adhesive tape.

It will readily be apparent that rapid acceleration and deceleration of the paper carriage in the beginning and end portions of its tabulating and return movement transversely of the machine will cause the weighted arm 3368 to swing and, through the arm 3367, to oscillate the lever 3359. As the latter rocks counterclockwise, the ratchet drive pawl 3358 will slip over the teeth of the ratchet wheel 3355 while the latter is held against counterclockwise rotation by the check pawl 3361, but when the arm 3359 rocks clockwise, the drive pawl 3358 will drive the ratchet wheel 3355 clockwise. The ratchet wheel, through its frictional engagement with the end of the right hand hub 3345, will drive the rewinding spindle to rewind the journal or other paper web 3301 whenever there is any slack in the paper between the platen roller 1056 and the rewinding spindle. The torque applied to the rewinding spindle by the ratchet wheel 3355 may be regulated by adjusting the collar 3357 and thus adjusting the compression of the spring 3356 so that the paper will be rewound sufficiently tightly but without causing it to slip about the platen roller.

I claim:

1. Roll paper rewinding means for a business machine having an intermittently movable paper carriage, com-

prising supporting means mountable on said carriage, a weighted member mounted on said supporting means for oscillatory inertial movement relative thereto to responsive to the intermittent movements of said supporting means with the carriage, a paper rewinding spindle rotatably mounted on said supporting means, and unidirectional driving means actuated by said weighted member as it oscillates and having a driving connection with said spindle to rotate the latter.

2. Roll paper rewinding means for a business machine having an intermittently movable paper carriage, comprising supporting means mountable on said carriage for movement therewith, a weighted member mounted on said supporting means for oscillatory inertial movement relative thereto responsive to the intermittent movements of said supporting means with the carriage, a paper rewinding spindle rotatably mounted on said supporting means, unidirectional driving means actuated by said weighted member as it oscillates, and a frictional drive transmission between said driving means and said spindle.

3. Roll paper rewinding means for a business machine having an intermittently movable paper carriage, comprising supporting means mountable on said carriage for movement therewith, a weighted member mounted on said supporting means for oscillatory inertial movement relative thereto responsive to the intermittent movements of the carriage, a paper rewinding spindle rotatably mounted on said supporting means, unidirectional driving means actuated by said weighted member as it oscillates, and a frictional drive transmission between said driving means and said spindle including a pair of frictionally engaged drive transmission elements and yielding means pressing one of said elements against the other.

4. Roll paper rewinding means for a business machine having an intermittently movable paper carriage, comprising supporting means mountable on said carriage for movement therewith, a weighted member mounted on said supporting means for oscillatory inertial movement relative thereto responsive to the intermittent movements of the carriage, a paper rewinding spindle rotatably mounted on said supporting means, unidirectional driving means actuated by said weighted member as it oscillates and a frictional drive transmission including elements connected with said driving means and with said spindle respectively, spring means pressing one of said elements into frictional driving engagement with the other of said elements, and means to adjust said spring means to vary the pressure of said one of said elements against the other.

5. Roll paper rewinding means for a business machine having an intermittently movable paper carriage, comprising supporting means mountable on said carriage for movement therewith, a pendulum pivotally mounted on said supporting means for oscillation relative thereto responsive to the intermittent movements of the carriage and in a plane parallel to said movements, a paper rewinding spindle rotatably mounted on said supporting means, unidirectional driving means actuated by said pendulum as it oscillates, and a frictional drive transmission between said driving means and said spindle.

6. Roll paper rewinding means for a business machine having an intermittently movable paper carriage, comprising supporting means mountable on said carriage for movement therewith, a pendulum pivotally mounted on

said supporting means for oscillation relative thereto responsive to the intermittent movements of the carriage and in a plane parallel to said movements, a paper rewinding spindle rotatably mounted on said supporting means, a ratchet wheel having a yielding drive connection with said spindle, a drive pawl actuated by said pendulum as the latter oscillates and cooperating with said ratchet wheel to rotate the latter, and means to check retrograde rotation of said ratchet wheel.

7. Roll paper rewinding means for a business machine having an intermittently movable paper carriage, comprising a pair of supporting standards mountable on said carriage for movement therewith, a bracket carried by one of said standards, a pendulum pivotally mounted on said bracket for oscillation relative thereto responsive to the intermittent movements of the carriage and in a plane parallel to said movements, a shaft supported in said standards, a paper rewinding spindle rotatably mounted on said shaft, a ratchet wheel rotatable on said shaft and having a frictional driving engagement with a portion of said spindle, a drive pawl actuated by said pendulum as the latter oscillates and cooperating with said ratchet wheel to rotate the latter, and means to check retrograde rotation of said ratchet wheel.

8. Roll paper rewinding means for a business machine having a movable paper carriage and means to intermittently move said carriage, comprising supporting means, means to detachably mount said supporting means on said carriage, a paper rewinding spindle rotatably mounted on said supporting means, unidirectional driving means having a driving connection with said spindle, and a weighted member mounted on said supporting means for inertial movement relative thereto responsive to the intermittent movements of said carriage and cooperating with said driving means to actuate the latter by said inertial movements of said member, whereby said rewinding means, when mounted on said carriage, is automatically powered by carriage moving means.

9. In a business machine having a traveling paper carriage, and means for intermittently moving said carriage, the combination of means in said carriage to support a roll of paper, a cover member mounted on said carriage for movement from a position in which it covers said roll of paper to a position in which it gives access to said paper, and a paper rewinding means mounted outwardly on said cover member and including an inertia operated drive means.

10. In a business machine having a traveling paper carriage, and means for intermittently moving said carriage, the combination of means in said carriage to support a roll of paper, a cover member mounted on said carriage for movement from a position in which it covers said roll of paper to a position in which it gives access to said paper, a paper rewinding means including an inertia operated drive means, and means detachably mounting said rewinding means on said cover member outwardly thereof.

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