

Feb. 2, 1960

E. PERSSON
NUMBERING APPARATUS

2,923,233

Filed Oct. 21, 1957

2 Sheets-Sheet 1

Fig-1

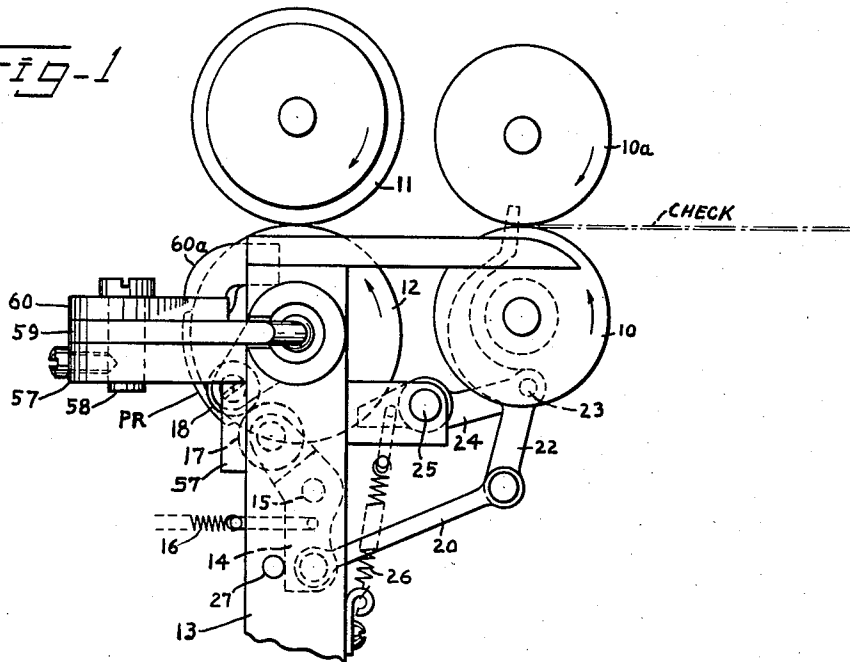
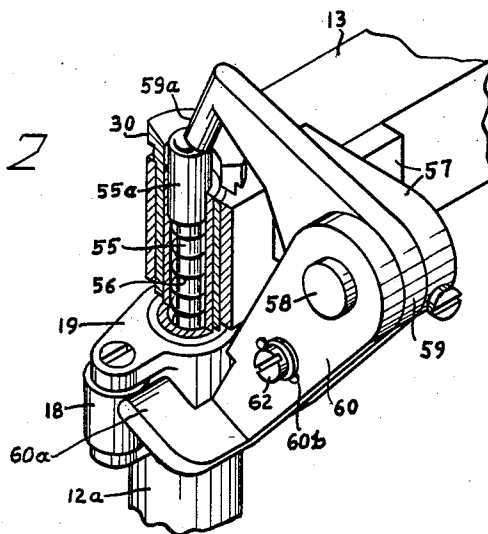


Fig-2



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2 Sheets-Sheet 2

Fig-3

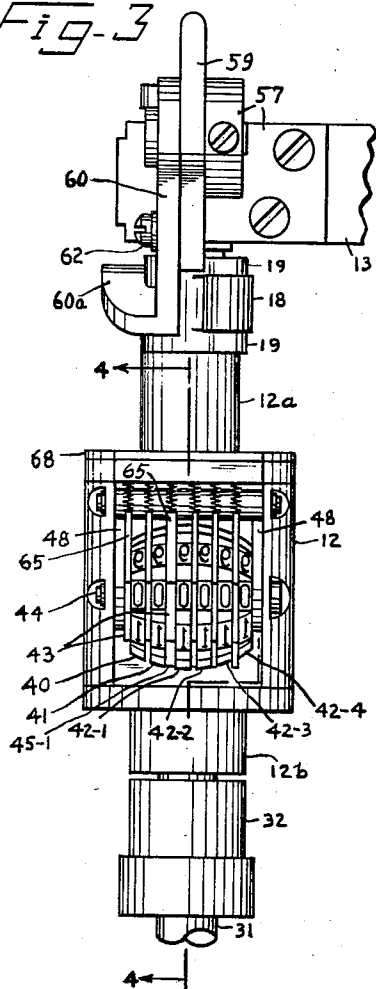


Fig-5

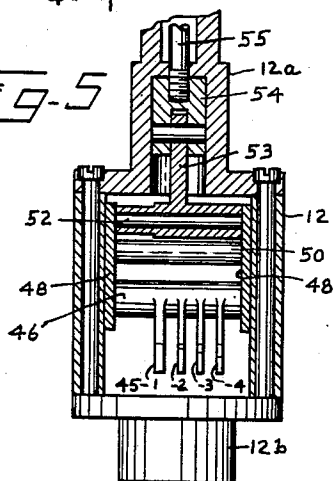
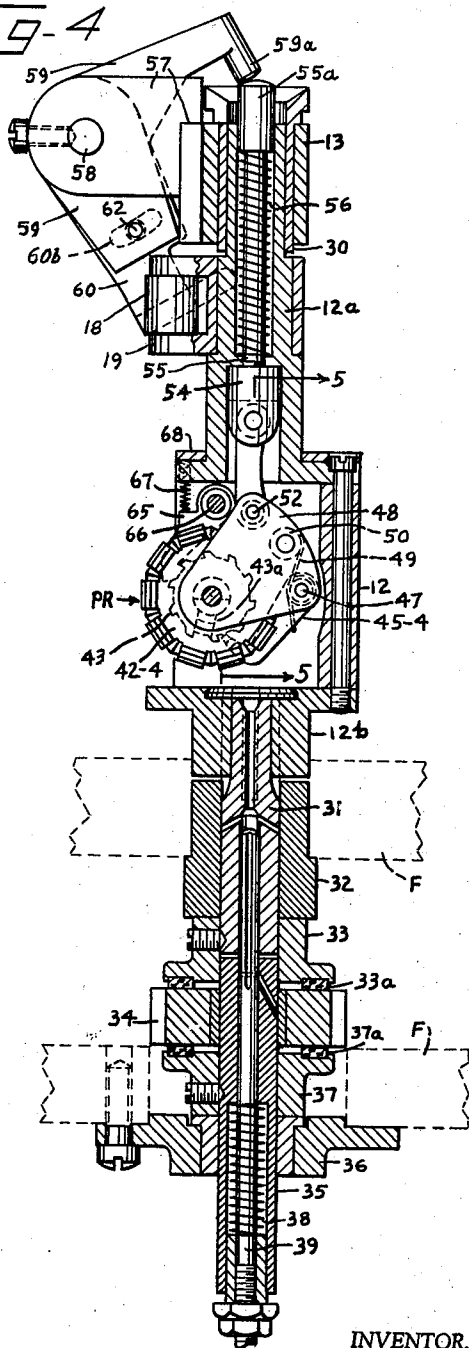


Fig-4



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2,923,233

NUMBERING APPARATUS

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11 Claims. (Cl. 101—76)

This invention relates to numbering apparatus in which a printing register rotates bodily to print serial numbers on consecutive records, such as checks or tickets or the like, fed at high speed past printing position.

The general object of the subject invention is to provide a novel automatic stepping arrangement for a register on a rotatable carrier. According to the invention, the stepping arrangement interposes, between a register stepping member and a stepping control element both on the carrier, a device mounted off the carrier for operation by the control element during a carrier cycle to effect actuation of the register stepping member.

The invention deals particularly with the stepping of a printing counter mounted on a one-revolution carrier for serially numbering a run of discrete records continuously fed in succession across printing position. As each record comes toward printing position, it controls start-stop means to release a stop element on the carrier so as to initiate a one-revolution cycle of the carrier during which the printing counter coacts with a platen to print a serial number on the record. In order that the records in the run be consecutively numbered, the counter is stepped one unit per carrier cycle. A feature of the invention is that the counter stepping takes place under control of the stop element on the carrier in timed relation to the printing operation occurring within the carrier cycle initiated by release of the stop element. According to the invention, the stop element acts during each one-revolution cycle of the register carrier to cam a rockable device, mounted off the carrier, for actuating an axially slidable member on the carrier to effect register stepping.

Other objects and features of the invention will be clear from the detail description, the claims, and the drawings.

In the drawings:

Fig. 1 is a plan view of the pertinent portion of a machine incorporating the novel numbering apparatus.

Fig. 2 is a partly sectioned isometric view of elements of the stepping arrangement for the numbering register.

Fig. 3 is an elevation of the numbering apparatus.

Fig. 4 is essentially a sectional view along lines 4—4 of Fig. 3 and includes the drive means associated with the numbering apparatus.

Fig. 5 is a sectional view substantially along lines 5—5 of Fig. 4, omitting the register wheels.

In the illustrative embodiment specifically disclosed herein, the numbering apparatus is part of a check handling machine of which only as much is shown as necessary to an understanding of the invention. In this machine, discrete checks from a supply station (not shown) are suitably guided in vertically facing disposition along a single-file course and successively fed to the numbering apparatus by means including a continuously turning pair of feed rollers 10 and 10a (see Fig. 1). The numbering apparatus includes a platen roller 11 and a register carrier generally designated 12, both rotatable about vertical axes. Carrier 12 is mounted for rotation by means including a horizontal frame bracket 13. The carrier has

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cylindrical portions participating with the platen roller in feeding each check advanced thereto by the feed rollers across imprint-receiving position. Mounted within the carrier for rotation bodily therewith and for stepping relative thereto is a plural order printing counter or register PR, indicated in Fig. 1 by an arc of protruding types concentric with the carrier axis. During a revolution of the carrier, the protruding arc of types of register PR will have rolling coaction with the platen 11 to print a serial number on a check while continuing feed of the check. The register carrier 12 is impositively rotatable through one-revolution cycles, each initiated by a check feeding to imprint-receiving position, the check functioning for this purpose through a start-stop means. The start-stop means includes a lever 14 mounted by a pivot 15 to the frame bracket 13 and urged by a spring 16 to position for maintaining a detent roller 17 on the front arm of the lever in the path of a stop roller 18 carried by an arm 19 fixed to carrier 12. The rear arm of the lever 14 is connected by a link 20 to the rear arm of a trip lever 22 fulcrumed at 23 on a rockable member 24. Member 24 is pivotally mounted by a stud 25 upon a lateral extension of bracket 13 and is biased counterclockwise by a light spring 26. In the home position of the register carrier 12, its stop roller 18 is against the detent roller 17 and the centers of the stop and detent rollers and of pivot 15 are in alinement. It requires but a light impact of the leading end of the oncoming check against the tip of the trip lever 22 to disturb the alinement of centers, causing detent roller 17 to release the stop roller 18 and, thereby, the register carrier for counterclockwise rotation by impositive drive means. In the early portion of the carrier revolution, the stop roller cams the detent roller out of the way, rocking the lever 14 counterclockwise away from limit stud 27. As the lever 14 rocks counterclockwise, it effects similar action of the trip lever 22 to cause the tip of the trip lever to retreat down and away from the advancing check. After stop roller 18 passes detent roller 17, spring 16 returns the detent roller to position for stopping the register carrier 12 at the end of a one-revolution cycle.

Referring to Figs. 3 and 4, register carrier 12 proper comprises a housing section with a cylindrical check-feeding periphery except for a chordal opening through which the register protrudes. Fixed upon the housing section is the similarly contoured flange at the lower end of a carrier hub sleeve or spindle 12a externally journaled within a bearing 30 in frame bracket 13. To the bottom of the housing section is secured the circular check feeding flange at the upper end of a sleeve 12b splined onto a carrier spindle 31. Spindle 31 is journaled in a bearing 32 mounted in frame F and below the bearing carries a collar 33 having a friction ring 33a sitting on the upper face of a drive gear 34. The drive gear is free on a tubular shaft 35 rotatable within a sleeve-lined bracket 36 mounted to frame F. On shaft 35 is fixed a collar 37 having a friction ring 37a engaged with the lower face of drive gear 34. A spring 38 inside shaft 35 and around a fixed rod 39 maintains pressure between the faces of drive gear 34 and the friction rings 33a and 37a. Drive gear 34 is continuously rotated by motor-driven gearing (not shown) and upon release of register carrier 12 by the start-stop means serves through the friction clutch, including friction ring 33a, to drive the carrier through its one-revolution cycle.

The register PR is a known form of printing counter and in the shown embodiment has six number wheels 40, 41, and 42—1, 42—2, 42—3 and 42—4. Each number wheel has a circle of digit types 0 to 9 and rigidly carries at its left side a ten-toothed ratchet wheel 43. The type and ratchet wheel assembly is rotatable on a sleeved shaft 44 fixed across the interior of the housing section of carrier

12 in an offset and perpendicular relation to the carrier axis. The type wheels 40, 41 and 42-1 to 4 are respectively sized and shaped to form an aggregate spheroidal register contour presenting in registering position an exposed protruding arc of types, one of each wheel, concentric with the carrier axis, as indicated in Fig. 1. During a carrier revolution, the registering arc of types coacts with platen 11 to print a serial number on a check. After printing and before the end of the carrier revolution, the register is advanced automatically by a stepping arrangement to prepare for printing a consecutive serial number during the next carrier revolution.

In the present embodiment, the automatic stepping means operates only upon the four register wheels 42-1 to 4, while the two register wheels 40 and 41 are manually settable. It is understood that any other number of the register wheels, or all, may be automatically stepped, and that the wheels 40 and 41 may be omitted, if desired. During a carrier cycle, the wheels 42-4, 42-3, 42-2, 42-1, 41 and 40 sequentially print the 6th to 1st place digits of a number. It may be noted that the ratchet wheel 43 of counter wheel 42-1 is nearly twice as thick as the other ratchet wheels so as to provide a distinctively increased space between the 3rd place digit and the two right hand digits of a printed number. At each carrier cycle, the wheels 42-1 to 4 are automatically advanced one count unit, while the wheels 40 and 41 remain set at chosen digit positions. Assuming that the wheels 40 and 41 are set at 00, typical consecutive numbers printed during five sequential carrier cycles on five successive checks may be, for example, as follows:

1297 00; 1298 00; 1299 00; 1300 00; and 1301 00

The present invention provides a novel stepping arrangement for counter orders 42-1 to 4. This arrangement may apply its effect to the counter orders through the intervention of any suitable counter actuating and carry means. As shown, the stepping arrangement functions through a rack of four pawls 45-1, 2, 3 and 4 (Figs. 3, 4 and 5) respectively associated with the counter orders 42-1, 2, 3 and 4. Pawls 45 extend integrally from a hub 46 free on a pin 47 across side plates 48 of a pawl rack cage, the plates flanking the number wheels 40, 41 and 42-1 to 4 and being rockably mounted on the register shaft 44. A wire spring 49 between the pawl rack and a cross rod 50 of the rack cage biases the pawl rack toward the ratchet wheels 43. In common with other counter actuating pawl and ratchet means of the same type, the noses of pawls 45-1 to 45-4 are of progressively shorter lengths and correspondingly decreasing depths of notches 43a are provided between the "9" and "0" teeth of the related ratchet wheels 43. The proportions are such that pawl 45-1 always engages the ratchet wheel of the first automatic counter order 42-1 while any higher order pawl reaches its associated ratchet wheel only when the preceding order pawl or pawls are in notches 43a of their related ratchet wheels. For instance, 45-4 does not engage its ratchet wheel except when the three preceding pawls 45-3, 2 and 1 are in notches 43a of their respective ratchets and is effective to produce a "tens" carry step of the fourth automatic counter order 42-4 only when the three preceding automatic counter orders are being stepped from 999 to 000.

Actuation of the pawl rack for stepping the register occurs upon the clockwise stroke of the rack cage comprising the rigidly connected side plates 48. These plates carry a hinge pin 52 for a connecting link 53 to a clevis 54 at the lower end of a plunger 55. The clevis slidably fits in the lower axial bore of carrier hub sleeve 12a and the plunger is slidably guided in the upper axial bore of the hub sleeve by its head 55a. A spring 56 around the plunger biases the plunger upwardly to hold the rack cage in counterclockwise position (Fig. 4). According to the invention, the plunger 55 will be depressed automatically at each revolution of the register carrier 12. For this purpose, there is fixed to frame bracket 13 an angle piece

57 in the outer leg of which is secured a pivot 58 for a two-part lever 59-60. One part 59 has upper and lower arms of which the upper arm has a downwardly pointing nose 59a for abutting the top of the plunger head 55a, accessible through the open upper end of carrier hub sleeve 12a (also see Fig. 2). The other part 60 of the lever 59-60 has a single arm fastened flat to the lower arm of part 59 and terminating in an angularly and forwardly projecting cam follower nose 60a in the path described by the stop roller during a revolution of the register carrier 12. During each carrier revolution, the type wheels 42-4, 42-3, 42-2, 42-1, 41 and 40 successively coact with platen 11 (Fig. 1) to print a number on a check in motion through the printing position. Shortly after the printing period starts, the stop roller 18 encounters the cam follower nose 60a of the lever 59-60 and starts camming the lever gradually through its plunger-depressing stroke. The resulting depression of the plunger 55 serves through the link 53 to rock the pawl rack cage 48 clockwise (Fig. 4) for effecting the forward stroke of the pawl rack 45. The camming action of the stop roller 18 upon the lever 59-60 is very gradual and the consequent forward stroke of the pawl rack takes place comparatively slowly. Due to this factor and the play between the nose of any pawl 45 and the facing abrupt side of a tooth of the associated ratchet wheel 43, the pawl rack takes effect only after the printing period has ended to produce a count step of advance of the automatic counting orders 42-1 to 4. To enable the cam follower nose 60a to be set in a position where its coaction with the stop roller 18 will insure timing of a full step of counting advance to occur after the final digit has been printed on a check, the parts 59 and 60 of lever 59-60 are angularly adjustable relatively to each other. For this purpose, the lever part 60 is fastened to part 59 by a clamp screw 62 passing freely through a slot 60b in part 60 and screwed into the lower arm of part 59. The slot 60b is arcuate about the lever pivot 58 and enables the cam follower part 60 to be adjusted angularly relative to the plunger-abutting part 59. After adjustment, the screw 62 is tightened against a lock washer between the head of the screw and the part 60. It may be mentioned that for the shown embodiment, it would be sufficient to adjust the timing so that the count step would occur only after the printing of a digit by the first order 42-1 of the stepped series of orders 42-1 to 4.

Holding and alining pawls 65 for the number wheels 40, 41 and 42-1 to 4 are pivoted on a pin 66 spanning the housing section of the register carrier 12. The pawls are biased into engagement with the ratchet wheels 43 by springs 67 held down in place on the pawls by a spring retainer plate 68 suitably fastened upon the flange of the carrier hub sleeve 12a and of the same peripheral contour as the flange.

It is to be understood that suitable inking means (not shown) are provided for inking the type or number wheels 40, 41 and 42-1 to 4 during each one-revolution cycle of the register carrier 12.

While the invention has been disclosed specifically in connection with a preferred embodiment, it will be understood that various changes and substitutions in the form and details of the device illustrated and in its operation may be made by those skilled in the art, without departing from the invention. It is intended, therefore, to be limited only as indicated by the following claims.

What is claimed is:

1. A registering apparatus having a rotary carrier, a data register mounted on the rotary carrier for rotation bodily therewith and for operation relative thereto, register operating means on the carrier for effecting the operation of the register relative to the carrier, reciprocable means for actuating said register operating means, support means for said reciprocable means past which the carrier is rotatable, and means provided on the carrier for operating said reciprocable means during a rev-

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olution of the carrier to effect actuation of said register operating means in timed relation to the carrier revolution.

2. A registering apparatus having a rotary carrier, a number register mounted on the rotary carrier for rotation unitarily therewith and for registration stepping operation relative thereto, register stepping means on the carrier for effecting the registration stepping operation of the register, reciprocable means for actuating said register stepping means, fixed support means for said reciprocable means, and means provided on the carrier for operating said reciprocable means during a revolution of the carrier to effect actuation of said register stepping means in timed relation to the carrier revolution.

3. A registering apparatus having a rotary carrier, a set of denominationally ordered number wheels mounted on the rotary carrier for rotation bodily with the carrier and for stepping relative thereto, pawl and ratchet means through which the set of number wheels is stepped, a reciprocable member mounted on the carrier for acting through said pawl and ratchet means to step the set of number wheels, movable actuating means for said reciprocable member arranged for pressure surface engagement therewith, stationary means mounting said actuating means adjacent the carrier, and means provided on the carrier for controlling movement of said actuating means during a carrier revolution to effect actuation of said reciprocable member by pressure engagement therewith.

4. A registering apparatus having a rotary carrier, a series of denominationally related counter wheels mounted on the rotary carrier for rotation unitarily with the carrier and for count stepping relative thereto, pawl and ratchet means through which the series of wheels is stepped, a reciprocable member mounted on the carrier and operatively connected with the pawl and ratchet means to serve therethrough upon a reciprocation to effect count stepping of the series of counter wheels, rockable means arranged for pressure actuating engagement with said reciprocable member, fixed means mounting said rockable means, and means on the carrier for cammingly coacting with said rockable means at each carrier revolution to rockably operate said rockable means for producing a reciprocation of said member to effect count stepping of the series of counter wheels.

5. Apparatus having a rotary housing provided with an externally journaled hollow spindle and having a counter provided with a set of denominationally related number wheels mounted in the housing for rotation unitarily therewith and for count stepping relative thereto, pawl and ratchet means associated with the counter and through which the counter is stepped, a spring-loaded plunger slidably axially mounted in said hollow spindle and having an end accessible at an open end of the spindle and having operative connection with the pawl and ratchet means to serve therethrough upon an actuation to effect a counting step of the counter, a fixed bracket, a bell crank lever pivotally mounted to said bracket, said lever having one end in abutting actuating contact with the accessible end of said plunger, the lever having an opposite cam follower end, a camming device carried by the housing for acting on said cam follower end during each housing revolution to rock the lever for causing the plunger abutting end of the lever to actuate the plunger for effecting a counting step of the counter in timed relation to the housing revolution, said lever having one part provided with the cam follower end and a separate part provided with the plunger abutting end, and an adjustable fastening connection between the two parts enabling them to be angularly adjusted relative to each other to adjust the timing of the counter step relative to the revolution of the housing.

6. Apparatus having a rotatable housing, a shaft

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mounted across the housing transversely to the axis of housing rotation, a series of denominationally related counter wheels carried by said shaft for unitary rotation with the housing and for rotative count stepping relative to the housing, pawl and ratchet means through which the series of counter wheels is stepped, a plunger slidably mounted by the housing and operatively connected with the pawl and ratchet means to serve therethrough upon actuation to effect a count stepping operation of the counter wheels, reciprocable actuating means for the plunger, fixed means mounting the actuating means, and means peripherally provided on the housing for operating the actuating means during each housing revolution to actuate said plunger for effecting one counting step of the series of counter wheels at each housing revolution.

7. Apparatus to index a run of successive records and having a rotary carrier driven through one cycle per record, a counter comprising a series of denominationally related number wheels mounted on the carrier for rotation bodily therewith and for stepping relative thereto, reciprocable means on the carrier effective on each reciprocation to produce a unit step of advance of the counter, rockable actuating means for said reciprocable means, fixed means mounting the rockable means, and means on the carrier for cammingly rocking said actuating means at each carrier cycle to produce a reciprocation of said reciprocable means for effecting a unit step of advance of the counter for each record in the run.

8. Apparatus handling successively fed records and having a releasably driven rotary carrier provided with a stop element, start-stop means released from said stop element under control of each successive record to initiate a one-revolution cycle of the carrier, a counter comprising denominationally related number wheels mounted on the carrier for rotation bodily therewith and for stepping relative thereto, counter stepping means on the carrier, and means operated by said stop element during each cycle of the carrier for controlling said counter stepping means to effect a unit count step of actuation of the counter at each carrier cycle.

9. Apparatus for handling successively fed discrete records and having a one-revolution carrier, a counter mounted on the one-revolution carrier for rotation bodily therewith and for stepping relative thereto, means on the carrier including a reciprocable member for effecting a unit count step of the counter at each reciprocation of the member, a rockable device arranged for pressure actuating coaction with said member, means relative to which the carrier is rotatable for mounting said device, and a stop element on the carrier releasable under control of each successive record for enabling the carrier to perform a revolution and cammingly rocking said device during the carrier revolution for actuating said member to produce a unit count step of operation of the counter.

10. In apparatus for serially numbering successively fed discrete records, a one-revolution carrier, means including a plural order printing counter mounted on the one-revolution carrier for rotation bodily therewith to print a serial number on a record and for count stepping relative to the carrier, means on the carrier including a reciprocable member for effecting a unit step of advance of the counter at each reciprocation of said member, rockable actuating means arranged for pressure actuating engagement with said member, fixed means mounting said actuating means, and a stop roller on said carrier releasable under control of each successive record fed to printing position for enabling the carrier to perform a revolution and cammingly acting on said actuating means during the revolution to act therethrough for producing a reciprocation of said member.

11. In apparatus for consecutively numbering successively fed discrete records by means including a printing

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counter mounted by a one-revolution housing for rotation bodily therewith and for stepping relative thereto through pawl and ratchet means, wherein the housing is rotatable about an axis parallel to the record plane and at a right angle to the direction of record feed and has an externally journaled hollow spindle, and wherein the counter has a series of denominationally related digit type wheels carried on a shaft supported across the housing at a right angle to the housing axis, with the wheels being respectively diametrically sized to present digit types, one of each wheel, arcuately disposed about the housing axis for printing a serial number on a record during a revolution of the housing; the combination with a plunger axially slidable in said spindle and having one end exposed therethrough and its opposite end operatively connected with said pawl and ratchet means to serve there-through upon a depression to effect a unit step of advance of the counter, of a lever having an end in abutting

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engagement with the exposed end of the plunger and having a cam follower portion, fixed means mounting the lever, and a stop element on the housing releasable under control of each successive record fed to printing position for enabling the housing to perform a revolution and cammingly acting on the cam follower portion of said lever during the housing revolution for rocking the lever to depress the plunger to effect a unit step of advance of the counter.

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