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(54) **Positive indexing mechanism for typewriter platen with improved detenting.**

(57) A typewriter platen detenting system which involves a detent roller (50) spring biased into the indexing ratchet (14) of the typewriter platen (10) is improved by the addition of a pawl stop (56) mounted physically to the detent roller mounting bracket (52) such that the index pawl (18), upon its completion of travel for effecting indexing of the platen (10), engages the pawl stop (56) and physically forces the detent member (50) into the teeth of indexing ratchet (14).

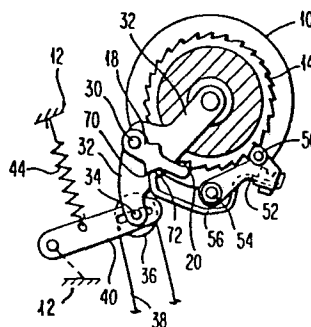


FIG. 3

POSITIVE INDEXING MECHANISM FOR TYPEWRITER
PLATEN WITH IMPROVED DETENTING

The invention relates to typewriters and, more particularly, to platen indexing mechanisms therefor.

Typewriters have platens against which the typing occurs and around which a sheet of paper is transported to effect line by line movement of the paper for printing on subsequent print lines.

In order to retain the platen in a stationary position during typing, a detenting arrangement is generally utilized. The detenting generally takes the form of a roller or detenting bar being spring biased into the index ratchet of the typewriter platen. As the detenting roller or detent member forces its way under spring bias into engagement with the teeth of the platen, it will act to position the platen in a consistent manner from line to line.

Line feed is accomplished in most typewriters by a pawl driven into the ratchet teeth and causing movement in a rotating motion about the axis of the ratchet, forcing the ratchet to rotate the platen. In order to stop the platen at the desired point, a fixed solid abutment member or pawl stop is mounted on the frame of the typewriter. The index pawl is thus physically jammed into the pawl stop. If the ratchet and platen are rapidly rotating and the pawl is forced into the pawl stop, the momentum of the platen and ratchet may cause the parts to deflect and cam the pawl out of engagement with the ratchet teeth sufficiently to allow an additional ratchet tooth to pass, thus misaligning the platen for the next print line. An additional potential problem is when the momentum will carry the platen only partially to the next print line position and the detent member may not have sufficient force exerted against it and the ratchet tooth to cause the platen and the ratchet to move back to its desired position. Adjustable pawl stops

and other solutions have been attempted. None of the solutions appear to be fully satisfactory inasmuch as parts must be maintained in as small a configuration and as light a weight as possible which tends to permit deflection and therefore prevent totally reliable performance.

Accordingly, it is an object of this invention to prevent overthrow of the platen during an indexing operation.

It is another object of the invention to insure the forcible engagement of the detent member with the platen ratchet wheel.

It is a further object of the invention to insure the proper alignment of the platen for the next printing line operation after an indexing function.

The objects of the invention are accomplished and the shortcomings of the prior art overcome by a typewriter platen indexing mechanism of the type comprising a platen rotatably supported by the typewriter frame, a ratchet wheel drivingly associated with said platen, a pawl for driving said ratchet, a pawl stop mounted on said typewriter frame and a detent means yieldably engaged with said ratchet and pivotally supported on said typewriter frame, said typewriter platen indexing mechanism being characterized in that:

said pawl stop is associated with said detent means to pivot the latter wheel into forcible engagement with said ratchet wheel, said pawl stop being engageable by said pawl, at the completion of the driving movement of said pawl to cause said detent means to forcibly engage said ratchet wheel,

whereby the force exerted by said pawl against said pawl stop acts to prevent said detent means from being forced out of said ratchet wheel and prevent overthrow of said ratchet wheel and said platen.

A better understanding of the invention may be had by referring to the drawings and the following detailed description.

In the drawings=

FIG. 1 illustrates a platen indexing system including a platen, ratchet and pawl arrangement.

FIG. 2 shows the indexing ratchet and detent roller and mounting brackets.

FIG. 3 is an end view of the platen, ratchet, detent and indexing pawl, together with the pawl stop.

FIG. 4 illustrates the technique utilized for selecting the increment of feed of the platen by controlling the point of engagement of the pawl with the ratchet.

Referring to FIG. 1, indexing of a typewriter platen 10 may be accomplished by a pawl and ratchet drive. The platen 10 is supported rotationally in typewriter frame 12. Frame 12 also supports a multitude of other assemblies and parts for accomplishing the indexing, as will be explained below. Indexing ratchet 14 is drivingly attached to platen 10 most commonly by a shaft (not shown). Supported on the shaft may be a line feed selection cam 16 which controls the point of entry into ratchet 14 of indexing pawl 18. Indexing pawl 18 has a tip 20 formed to engage ratchet 14. The positioning of cam 16 is controlled by a line feed selection lever 22 which is pivotally mounted on frame 12 by pivot member 24. Lever 22 extends into engagement with control arm 26 of cam 16 (see Fig. 4). Thus, cam 16 may be rotated about the axis of platen 10 to shift the cam profile controlling the entry of pawl tip 20 into ratchet 14. Pawl 18 is pivotally mounted on pivot member 30 to move into and out of engagement with ratchet 14. Additionally, pivot member 30 is fixedly attached to pawl support bracket 32, one end of which is pivotally supported by the platen shaft and the other end of

which carries a pin 34 for rotatably supporting a pulley 36. Pulley 36 is engaged about its periphery by carriage return cord 38 one end of which is grounded to the frame 12, the opposite end being controlled by a carriage return mechanism.

Any known technique for placing tension upon the carriage return cord to effect index is satisfactory.

A link 40 is pivotally supported on a pivot pin 42 which is, in turn, attached to frame 12. This link is spring biased by a spring 44 attached to frame 12, to cause restoration of pulley 36 when the tension in cord 38 is relaxed. Link 40 engages pin 34 with a lost motion slot 46.

Referring to FIG. 2, detent roller 50 is rotationally supported in detent bracket 52. Detent bracket 52, in turn, is pivotally supported on member 54 which extends outwardly from frame 12 and provides an axis of rotation for detent bracket 52. Pawl stop 56 is rigidly attached by conventional means such as screw 58 to detent bracket 52. Detent bracket 52 is also spring biased by spring 60 illustrated in FIG. 4 to effect a movement of detent bracket 52 about its axis of rotation 54 and to engage detent roller 50 with the teeth of ratchet 14. Cam 16 provides a plurality of notches 62 representing different degrees of rotation of the platen during an indexing phase. The engagement of spring 60 with one of the notches 62 determines the cam profile against which index pawl 18 rides and which controls the entry point of the pawl tip 20 into the ratchet teeth 14. Spring 60, while acting as a detenting member on cam 16 also provides a biasing force against detent bracket 52 to force the detent member 50 into engagement with ratchet teeth 14. Referring to Fig. 3, it will be seen that as cord 38 is pulled, pulley 36 pulls on pivot member 34 drawing member 32 downward. As member 32 is pulled downward, pivot member 30 and pawl 18 are also pulled downward and with the tip 20 of pawl 18 engaged in ratchet 14, the continued tension on cord 38 and

movement of the linkage described immediately above will cause the rotation of bracket 32 about the axis of platen 10.

As this occurs, pawl 18 will drive ratchet 14 to rotate platen 10. When pawl 18 reaches the end of travel to position platen 10 at the next writing line, its stop surface 70 will engage the end 72 of pawl stop 56. As additional force is exerted on cord 38 with that force being transmitted to pawl 18, surface 70 will engage, with increasing force surface 72 of pawl stop 56, effecting a rotation of detent bracket 52 about pivot 54. The rotation of detent bracket 52 about pivot 54 will physically jam detent roller 50 into the associated tooth of ratchet 14. As the tension increases in cord 38, the forces throughout the mechanical chain will likewise increase further preventing the movement of ratchet 14 and platen 10. With the additional force of detent 50 against ratchet 14, it becomes exceedingly difficult for platen 10 to overthrow due to momentum.

As cord tension is relieved on 38, return spring 44 acts to pull link 40 upward which, in turn, will act to restore member 32 and pawl 18 to a raised and disengaged position such that ratchet 14 may be either manually turned or pawl 18 is in position for a subsequent index cycle.

CLAIMS

1. A typewriter platen indexing mechanism to provide line by line feed of a writing page of the type comprising a platen (10) rotatably supported by the typewriter frame (12), a ratchet wheel (14) drivingly associated with said platen (10), a pawl (18) for driving said ratchet wheel (14), a pawl stop (56) mounted on said typewriter frame (12), and a detent means (50) yieldably engaged with said ratchet wheel (14) and pivotally supported on said typewriter frame (12),

said typewriter platen indexing mechanism being characterized in that:

said pawl stop (56) is associated with said detent means (50) to pivot the latter into forcible engagement with said ratchet wheel (14), said pawl stop (56) being engageable by said pawl (18) at the completion of the driving movement of said pawl (18) to cause said detent means (50) to forcibly engage said ratchet wheel (14);

whereby the force exerted by said pawl (18) against said pawl stop (56) acts to prevent said detent means (50) from being forced out of said ratchet wheel (14) and prevent overthrow of said ratchet wheel (14) and said platen (10).

2. A typewriter platen indexing mechanism according to Claim 1 characterized in that said pawl stop (56) is pivotally mounted with respect to said typewriter frame (12).
3. A typewriter platen indexing mechanism according to Claim 2 characterized in that said pawl stop (56) and said detent means (50) are commonly pivotally mounted on said frame (12).

4. A typewriter platen indexing mechanism according to Claim 1 characterized in that said pawl stop (56) is attached to said detent means (50) and thereby mounted pivotally on said typewriter frame (12).

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FIG. 1

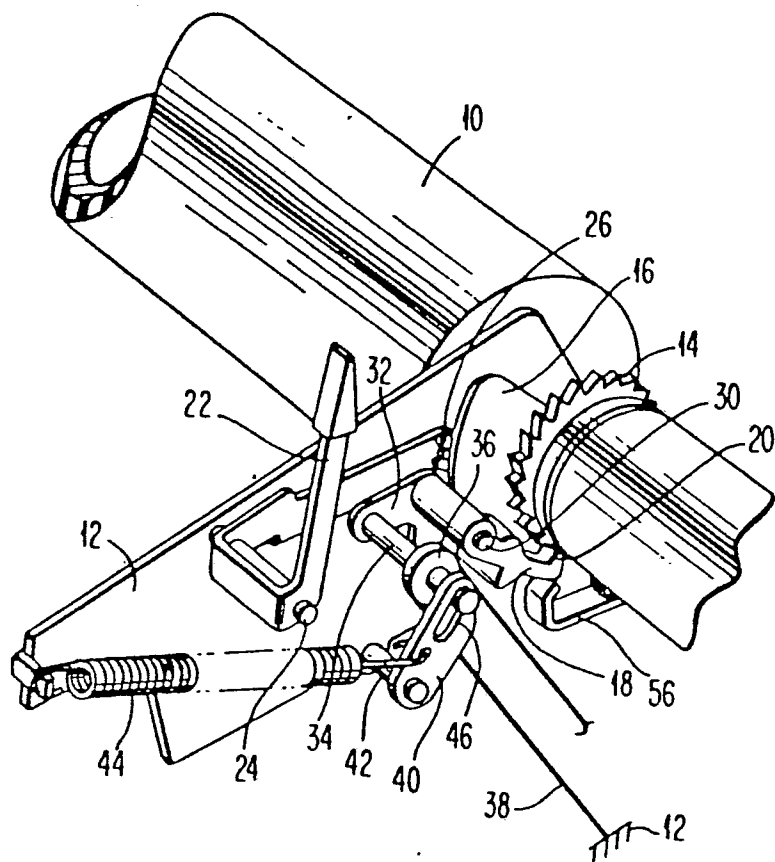
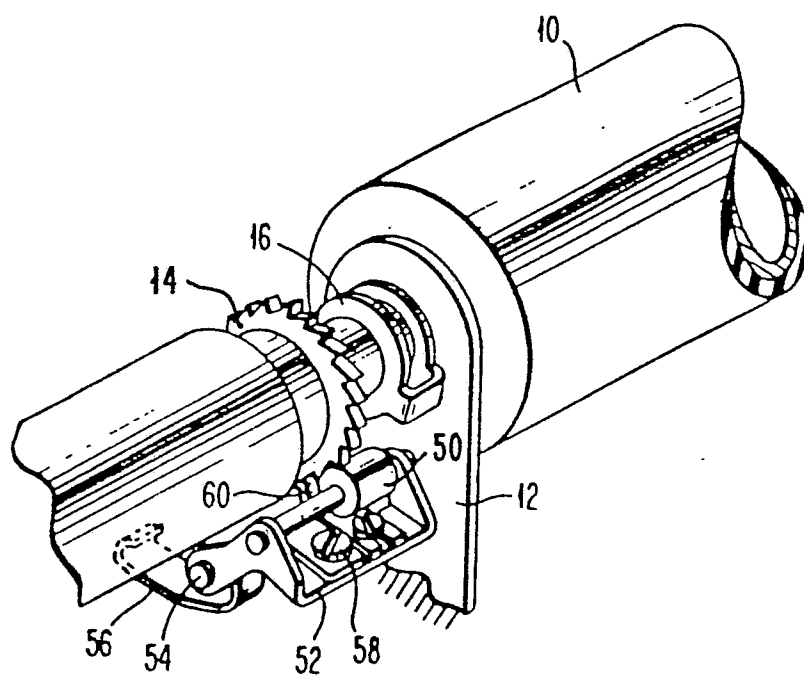


FIG. 2



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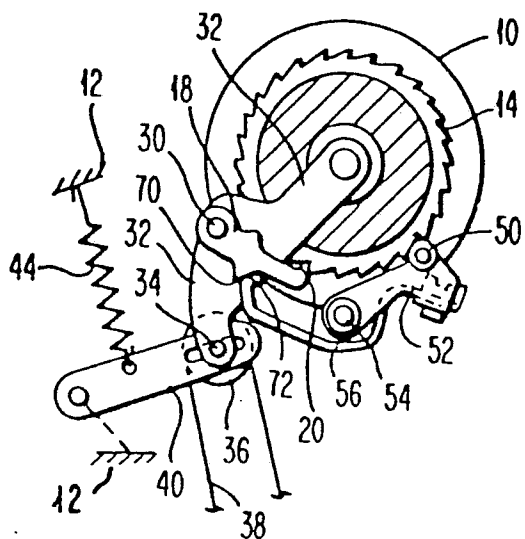


FIG. 3

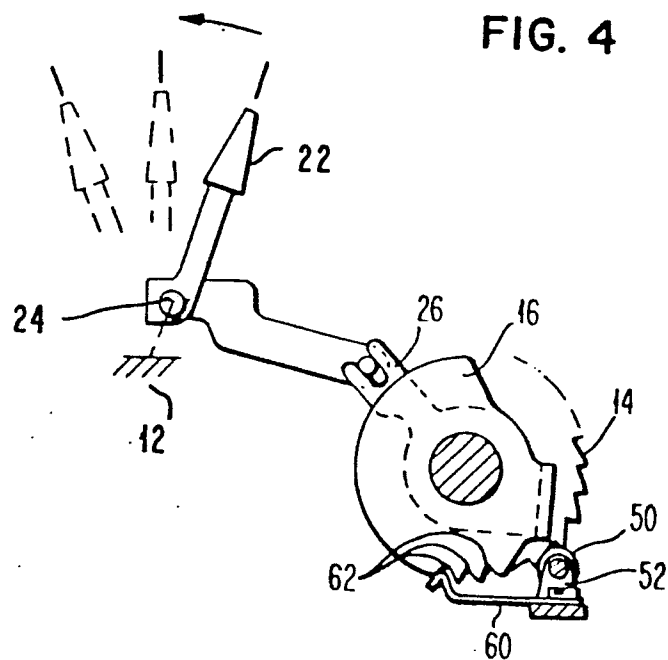


FIG. 4



European Patent
Office

EUROPEAN SEARCH REPORT

0042949

Application number

EP 81103619.3

DOCUMENTS CONSIDERED TO BE RELEVANT			CLASSIFICATION OF THE APPLICATION (Int. Cl.)
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	
	----- No relevant documents have been disclosed.		B 41 J 19/86
			TECHNICAL FIELDS SEARCHED (Int. Cl.)
			B 41 J 19/00 B 41 J 25/00
			CATEGORY OF CITED DOCUMENTS
			X: particularly relevant A: technological background O: non-written disclosure P: intermediate document T: theory or principle underlying the invention E: conflicting application D: document cited in the application L: citation for other reasons
			&: member of the same patent family. corresponding document:
X	The present search report has been drawn up for all claims		
Place of search VIENNA		Date of completion of the search 17-09-1981	Examiner KIENAST