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ADJUSTABLE PAPER STOP FOR BUSINESS MACHINES

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2 Sheets-Sheet 2

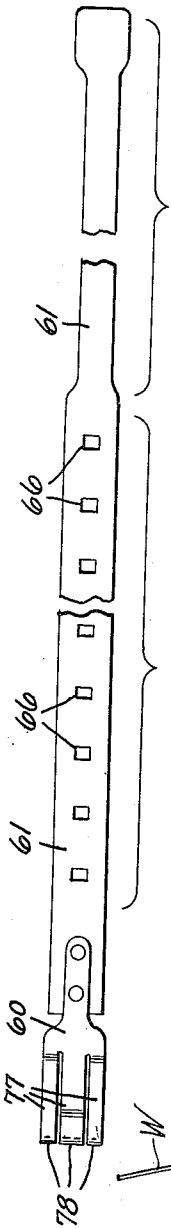


Fig. 3.

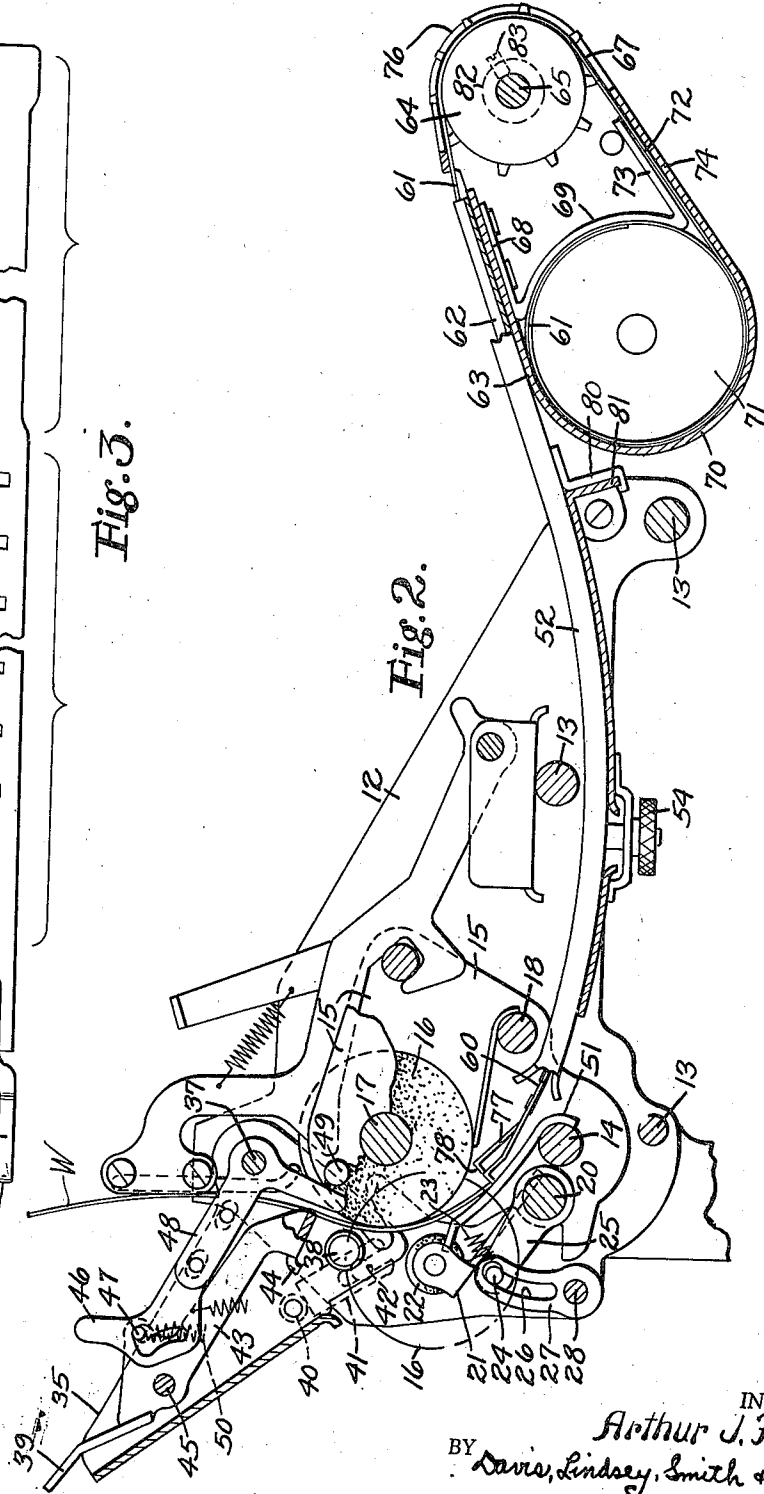


Fig. 2.

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## ADJUSTABLE PAPER STOP FOR BUSINESS MACHINES

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4 Claims. (Cl. 197-140)

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This invention relates to adjustable paper stops for business machines, more particularly business machines with front-feed paper carriages. Such machines are frequently used in work requiring that entries having given dates be printed on particular lines allotted to such dates on the record or work form. For instance, calculating and accounting machines are frequently used in posting entries on ledger sheets of accounts involving periodic debits or credits, the ledger sheets having date lines for the periodic entries so that all entries to be posted on a given date by the machine being used will be recorded on the same line of the ledger sheets for all of the accounts involved. Instead of requiring the operator, when inserting successive ledger sheets into the paper carriage of the machine, to adjust each ledger sheet individually and carefully to the proper line position, it is convenient to provide the paper carriage of such machine with paper stops which can be adjusted to different positions corresponding to the different entry lines of ledger sheets or forms so that, after adjusting such paper stops to the proper position, the operator can thereafter push or drop the ledger sheets or forms successively into the paper carriage and depend upon the paper stops to properly position each ledger sheet or form by engagement with the end thereof to limit the extent of insertion of the sheet into the carriage. Adjustable paper stops of various constructional forms and arrangements have been provided for this purpose, some not providing sufficient accuracy and/or flexibility and/or ease of adjustment, and some being too expensive and/or complicated of construction and/or having various other disadvantages.

An object of the present invention is to provide improved adjustable paper stop means for business machines.

A further object of the invention is to provide paper stop means which are very easily and readily adjustable to the exact positions required.

A further object of the invention is to provide adjustable paper stop means of simple and inexpensive construction.

Further objects and advantages of the invention will appear hereinafter.

An embodiment of the invention is illustrated in the accompanying drawings, in which

Figure 1 is a perspective view of a front-feed paper carriage of a Burroughs "high keyboard" calculating or accounting machine having the invention applied thereto;

Fig. 2 is a cross section of the carriage; and

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Fig. 3 is a plan view of one of the adjustable stops and of the spring tape by which it is carried.

The illustrated paper carriage is a front-feed carriage of a construction extensively employed on Burroughs "high keyboard" machines, being laterally movably supported at the back of the machine on a raceway 10. The carriage comprises a pair of side frame members 12 held in suitable laterally spaced directions by suitable cross members such as 13 (Fig. 2) and rockably supporting a shaft 14 to which are secured the end plates 15 of a rockable platen frame. The platen 16 is carried by a shaft 17 rotatably mounted in the plates 15 comprising also cross members 18. The means for rocking the platen frame to carry the platen from its printing position to its front-feed position as well as other details of construction and operation of the carriage generally are described and illustrated in Muller Patents Nos. 2,202,595, 2,192,324 and 2,147,051, as well as in other issued patents.

In the drawings, the platen 16 is shown in its out-of-printing or front-feed position, the printing position of the platen being indicated in dot-dash lines in Fig. 3. A shaft 20 journaled in the end plates 15 of the rockable platen frame supports a plurality of yoke members 21 carrying rotatable paper feed or pressure rolls 22. The feed or pressure rolls 22 are yieldingly urged toward the platen 16 by a spring 23 connected at one end to a stud 24 carried by an arm 25 secured to the shaft 20. The stud 24 passes through a slot 26 in a link 27 pivoted on a stud 28 secured in an end plate 12 of the paper carriage, the slot being so proportioned that the feed or pressure rolls 22 are permitted to remain in contact with the platen 16 while the platen is in printing position and during the major portion of the movement of the platen from its printing position to its out-of-printing or front-feed position. Near the end of the rocking of the platen frame away from printing position, the stud 24 reaches the end of the slot 26 whereby the feed rolls 22 are arrested and, as the platen 16 completes its movement from its printing position, a front-feed throat is opened between the platen and feed rolls to permit removal of a work sheet W and the insertion of another. As the platen is returned from its out-of-printing position to its printing position, the feed rolls remain stationary during the initial movement of the platen toward printing position, whereby the front-feed throat is closed and the newly inserted work sheet W is gripped between the platen and the feed rolls,

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after which the feed rolls are moved by the platen during the remainder of the latter's movement toward printing position.

The front feeding of work sheets W into the paper carriage is facilitated by a front-feed paper chute 35 pivoted at 37 on the side plates 12 of the paper carriage. The side members of the paper chute 36 carry roller studs 38 adapted to cooperate with the upper edges of the plates 15 whereby the chute 35 is rocked clockwise from the position of Fig. 2 as the platen is returned to printing position and said chute returns to the position of Fig. 2 as the platen frame is again rocked out of printing position. Somewhat before the movement of the platen frame out of printing position is completed, a stud 40 in the right-hand side member of the paper chute 35 engages a stop member 41 which has an elongated slot through which passes a screw 42 threaded into the right side plate 12 of the carriage whereby the stop member is secured to the plate 12 adjustably to permit the paper chute to be held in the desired position when the platen is in its out-of-printing position.

The front-feed paper chute 35 also supports a line finder 43 which may be generally like that illustrated in Muller Patent No. 2,147,051 or No. 2,192,324. The line finder comprises a blade 44 which, in its normal position, lies in the plane of the front plate 36 of the paper chute and acts as a portion of the paper chute in guiding front-fed papers W into the throat between the feed rolls 22 and platen 16. From this normal position the line finder 43, 44, which is pivoted at 45 to the end plates of the paper chute 35, is movable to a line finding position as illustrated in Fig. 2 where it may be releasably held by a latch member 46 having a generally L-shaped slot receiving a stud 47 on the right side member of the paper chute, said latch member being supported on a bell crank lever 48 pivoted on the right-hand stud 37 on which the paper chute is pivoted. When the platen frame is rocked to printing position, a stud 49 in the right side plate 15 of the platen frame engages the lower arm of the bell crank 48 and rocks the latter to release the line finder for return of the latter to normal position by a spring 50.

The papers W front-fed over the paper chute 35, 36, after passing into the throat between the feed rolls 22 and platen 16, are guided around under the platen by means of a guide plate 51 carried on the shaft 14 of the rockable platen frame. As the lower edges of the front-fed papers leave the plate 51 they are further guided by rear guide plates or chutes 52 which are laterally adjustably mounted on a plate 53 supported by and between the end plates of the carriage frame. The rear paper guides may be secured in any position of lateral adjustment on the plate 53 by means of knurled nuts 54. The outer lateral edge of each rear paper guide 52 is turned upwardly and inwardly to provide a channel to receive and guide the respective lateral edge of the front-fed paper, the lower and upper walls of the channel being flared outwardly at the front end of the paper guide to facilitate the entry of the edge of the front-fed form into the guide channel.

Each rear paper guide member 52 carries an adjustable stop device comprising a stop member 60 secured to a tape 61 of spring metal guided in channels formed in the opposite sides of a guide member 62 secured to the respective one of the rear paper guides 52. The rear portion of the

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tape 61 is received in a housing 63 containing a sprocket wheel 64 which is mounted on a shaft 65 for rotation with the latter. The tape 61 has perforations 66 spaced in conformity with the spacing of the teeth of the sprocket wheel 64, the rear portion of the housing 63 being of such configuration as to hold the tape 61 in contact with the sprocket wheel 64 on both sides of the tape perforations 66 and sprocket teeth as the tape 61 makes nearly a half turn about the sprocket wheel 64. The housing is also slotted at 67 to accommodate the portions of the sprocket teeth passing through the perforations 66 in the tape. There is secured in the housing a member 68 having a semicylindrical wall 69 which, together with the semicylindrical front wall 70 of the housing 63, provides a space 71 of circular cross section within which the end portion of the tape 61 is coiled after entering therein through a channel 72 formed between a lower flat portion 73 of the member 68 and the lower wall 74 of the housing 63. The tape 61 is of such length that, even with the maximum amount of tape withdrawn from the housing 63 to project the stops 60 to the forward limits of their adjustment, somewhat more than a complete turn or coil of the tape 61 will still remain in the storage space 71 so that, in retracting the stops 60 rearwardly from the front-feed throat, the tape 61 may be returned easily into the storage space 71 without interference between the free end of the tape 61 and any irregularities in the cylindrical inner wall of the storage space 71, such as that at the juncture of the upper wall of the housing 63 and the upper front portion of the member 68.

The shaft 65 upon which the sprocket wheels 64 of both adjustable stop devices are mounted carries a twirler 75 by which the shaft 65 may be rotated manually to adjust both stops 60 in unison.

The spring tape 61 is of the kind having an arcuate transverse curvature which, as well known, causes it to endeavor to uncoil and straighten out longitudinally. This uncoiling tendency of the tape 61, while it does not hinder easy entry and withdrawal of the tape into and from the storage space 71 when the sprocket wheel 64 is rotated by means of the twirler 75, does, however, cause the tape 61 coiled in the space 71 to bear against the wall of the space 71 sufficiently to provide a frictional clutching action adequate to hold the stops 60 in any desired positions of adjustment. The frictional clutching action of the coiled portion of the tape 61 within the space 71 is aided in this respect by the frictional engagement of that portion of the tape 61 passing around the sprocket 64 against the semicylindrical rear wall 76 of the housing 63.

The forward end of each stop 60 is slit to provide three tongues or blades 77, each having a downwardly turned end 78 to provide a stop surface for engagement by the rearward or bottom edge of the front-fed paper W. The center tongue or blade 77 is bent up only slightly, preferably near its forward end, and the two outer tongues or blades 77 are bent further upwardly to an extent substantially equal to the length of the turned-down end portion 78 of each blade 77, whereby the forward ends of the three blades 77 are given staggered positions, providing a greater total height of stop surface for engagement with the rear or bottom edge of the front-fed paper W than would be available if all of the

blades 77 were in horizontal alignment. This construction of the stops 60 also has the further advantage of permitting the stops to enter further forward into the throat between the platen 16 and the lower guide plate 51 than would be possible if rigid stops with the same height of end stop surface were employed, the flexibility of the blades 77 of the stops 60 being such as to permit of some compression of the stops 60 between the platen 16 and the plate 51.

The rear paper guides 52 are provided with guide brackets 80 secured thereto and engaging around the under edge of a downwardly turned flange 61 along the rear of the plate 53 whereby, after loosening of the knurled nuts 54, the paper guides 52 may be adjusted laterally to suit work sheets W of different widths. The sprocket wheels 64 also have collars 82 into which are threaded set screws 83 which may be loosened to permit the adjustment of the sprocket wheels 64 along the shaft 65 as the rear paper guides 52 are adjusted laterally on the plate 53, after which the set screws 83 may again be tightened to secure the sprocket wheels 64 to adjusted position on the shaft 65 for rotation therewith.

At the commencement of a series of postings the operator, after the platen 16 has been thrown back out of printing position and the front-feed throat opened, will insert the first work sheet or perhaps a trial sheet into the carriage over the front-fed chute 35, 36, and then manipulate the finger-piece 39 to move the line finder 43, 44 to its line finding position of Fig. 2. Then the operator will manipulate the twirler 75 to adjust the stops 60 until they stop the front-fed paper W in the correct position to receive the entry on the desired line thereon. At that time, as well understood, the entry printed on the line immediately above the line upon which the next entry is to be made will appear immediately above the edge of the line finder blade 44. Upon return of the platen to printing position, the front-feed paper chute 35, 36 and line finder 43, 44 are automatically returned to their normal positions. After making the required entry or entries on each inserted form W, the operator needs only to insert the next form or work sheet W as far as permitted by the stops 60 which, by friction of the coiled portions of the tapes 61 in the housings 63, frictionally hold the stops in their adjusted positions until the adjustment is altered by the operator. Thus all of the entries for the particular run of work may be completed without readjustments of the stops except such as might sometimes be required because the initially made adjustment was not correct or because of some inaccuracy in the positions of the rulings on the forms. The stops 60, though adequately and securely held in any given position of adjustment, are yet instantly readily adjustable by mere rotation of the twirler 75. The paper stop means described and illustrated is of very simple and inexpensive yet durable construction and reliable in operation.

While the paper stop means of the present invention have been illustrated as applied to a particular type of paper carriage on a Burroughs "high keyboard" machine, it will be readily apparent to those skilled in the art that the stop means of the present invention are readily applicable to a great variety of paper carriages on business machines of various kinds. It will also be apparent to those skilled in the art that the construction of the paper stop means of the in-

vention may be modified in various ways within the scope of the appended claims.

I claim:

1. Adjustable stop means comprising a housing having wall portions defining a storage space of generally circular cross section, a second space within said housing, and a passage between said spaces in said housing, a longitudinally self-straightening spring tape having longitudinally spaced perforations and extending through said passage and having one end portion coiled within said storage space by confinement by the wall thereof, a sprocket wheel in said second space within said housing and having teeth engaging in said perforations in said tape, means exterior to said housing to rotate said sprocket wheel to move said tape into and out of said storage space through said passage, said housing having an opening through which said tape passes from said sprocket wheel, a stop on the exterior end of said tape, and guide means engaging the edges of said tape exteriorly of said housing.

2. Adjustable stop means comprising a housing having a substantially semicylindrical end wall and a substantially semicylindrical partition wall which, together with said end wall, defines a storage space of generally circular cross section with a passage opening substantially tangentially into said storage space, said housing also having a substantially semicylindrical opposite end wall, a shaft substantially concentric with said opposite end wall being slotted to accommodate said teeth and permit rotation of said sprocket wheel, a longitudinally self-straightening spring tape extending through said passage and having one end portion coiled within said storage space and frictionally bearing on said semicylindrical walls, said tape passing between the body of said sprocket wheel and said opposite end wall and having longitudinally spaced perforations to receive said sprocket teeth and said housing having an opening for passage of the opposite end portion of said tape therefrom, and means to rotate said shaft and sprocket wheel to move said tape against the resistance of said frictional bearing into and out of said storage space through said passage, and a stop means connected with said opposite end portion of said tape for adjustment of said stop by rotation of said shaft.

3. In a paper equipment for business machines, having parts relatively movable to open and close a front feed paper throat between them, and a pair of laterally adjustable paper guide members extending rearwardly from said throat, the combination of a housing rearwardly of each of said paper guide means, each housing having wall portions defining a storage space of generally circular cross section and a second space, a passage extending between said spaces, a spring tape for each housing extending through said passage and having one end portion coiled within said storage space by confinement by the wall thereof, rotatable means in said second space to move said tape lengthwise through said passage and into and out of said storage space, a stop means carried by the other end portion of each tape, guide means carried on each of said paper guide means, extending toward said throat and engaging the edges of said tape between said tape-moving means and said stop means, and a common shaft for rotating both of said rotatable means and adjustably connected with both of said rotatable tape-moving means to permit adjustment of said stop means, housings and paper

guide means laterally toward and from each other.

4. In a paper equipment for business machines, having parts relatively movable to open and close a front-feed paper throat between them, and a pair of laterally adjustable paper guide members extending rearwardly from said throat, the combination of a housing rearwardly of each of said paper guide means, each housing having wall portions defining a storage space of generally circular cross section and a second space, a passage extending between said spaces, a longitudinally self-straightening spring tape for each housing extending through said passage and having one end portion coiled within said storage space by confinement by the wall thereof, said tape having longitudinally spaced perforations, a sprocket wheel in said second space in each housing having teeth engaging in perforations in said tape to move the latter lengthwise through said passage and into and out of said storage space and housing, a stop means carried by the other end portion of each tape, guide means carried on each of said paper guide means, extending toward said throat and engaging the edges of said tape

between said tape-moving means and said stop means, and a common shaft passing through said second spaces of both housings and having both sprocket wheels secured thereon, at least one of them adjustably to permit adjustment of both of said stop means, with the respective housings and paper guide means laterally toward and from each other.

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