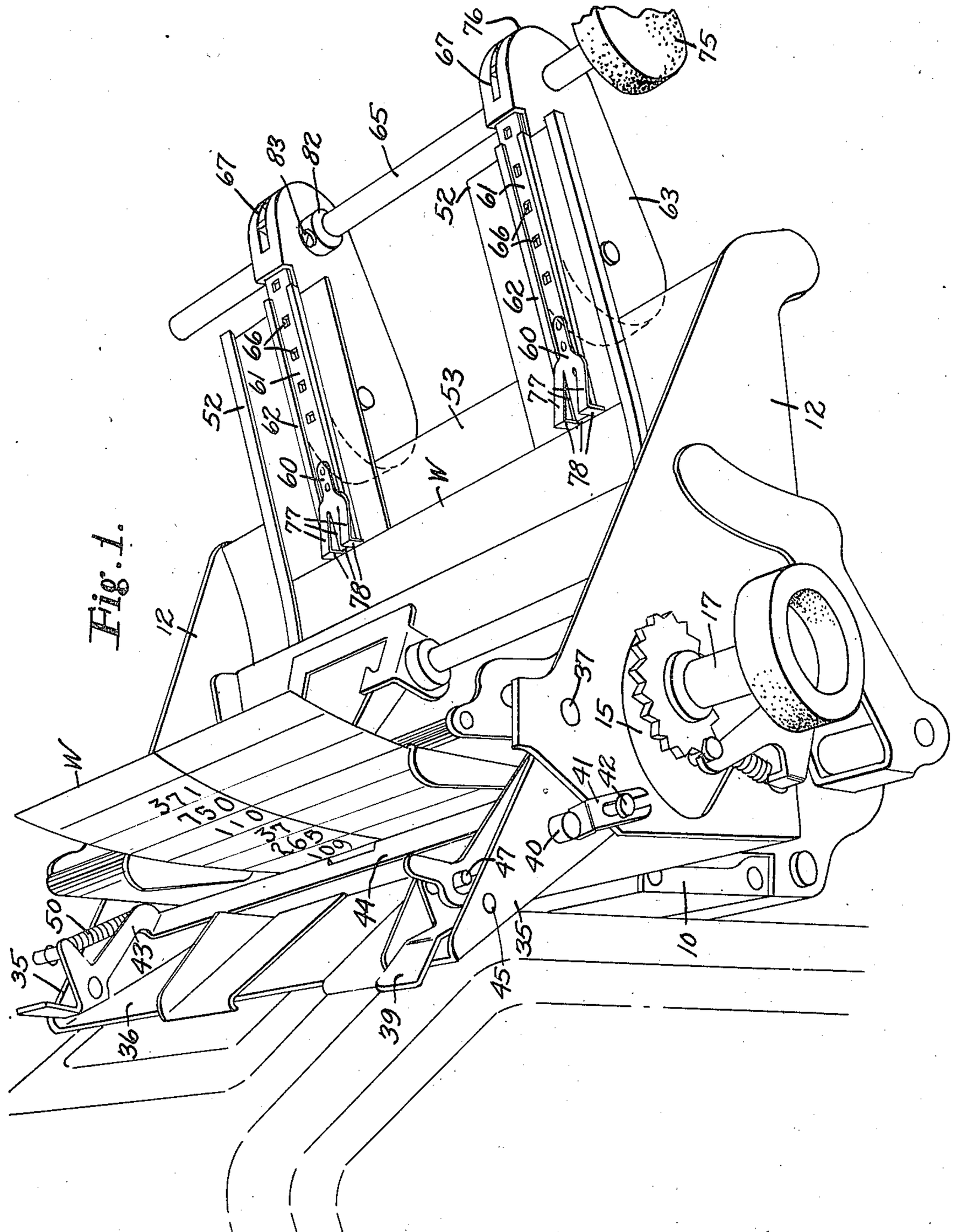
July 6, 1948. A. J. FETTIG 2,444,641

ADJUSTABLE PAPER STOP FOR BUSINESS MACHINES

Filed Nov. 27, 1942

2 Sheets-Sheet 1

Fig. 1.



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2 Sheets-Sheet 2

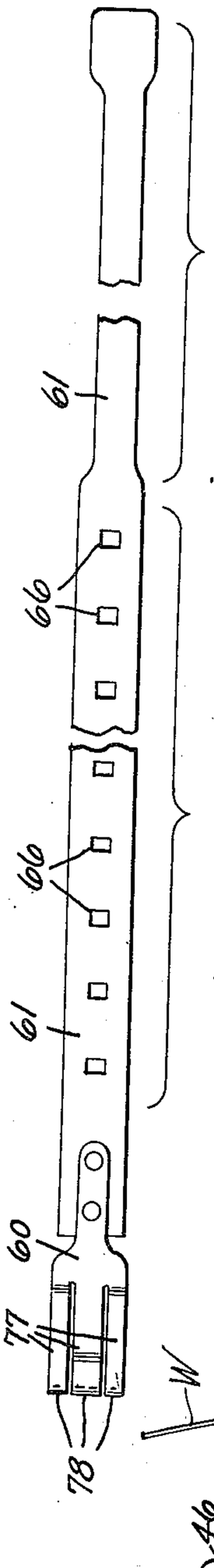

Fig. 3.

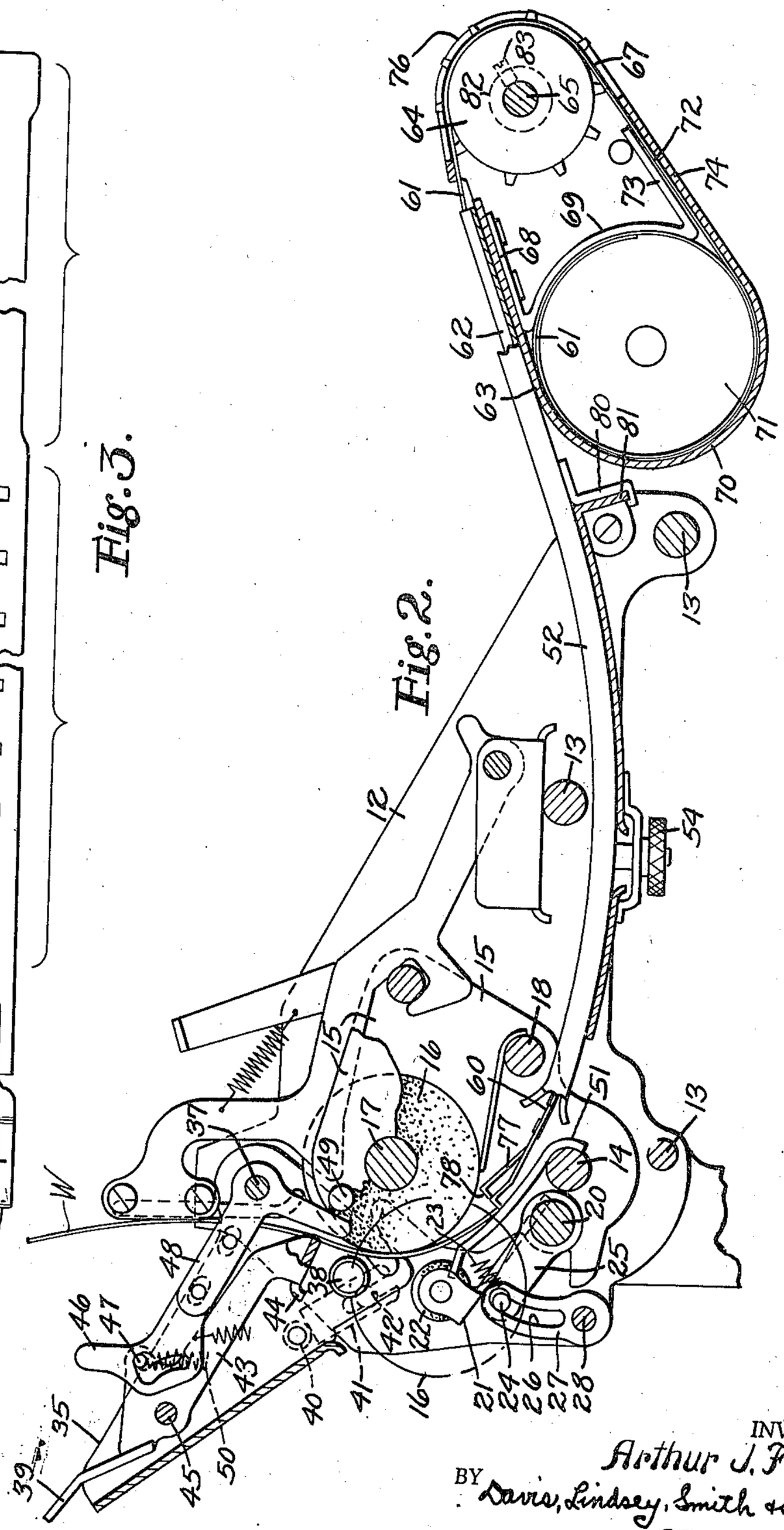

Fig. 2.

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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,

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

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 81 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 invention 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, a sprocket wheel on said shaft, 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 reawardly 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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