Oct. 1, 1940. B. F. AKIN 2,216,334

WEB FEEDING DEVICE

Filed June 10, 1940 2 Sheets-Sheet 1

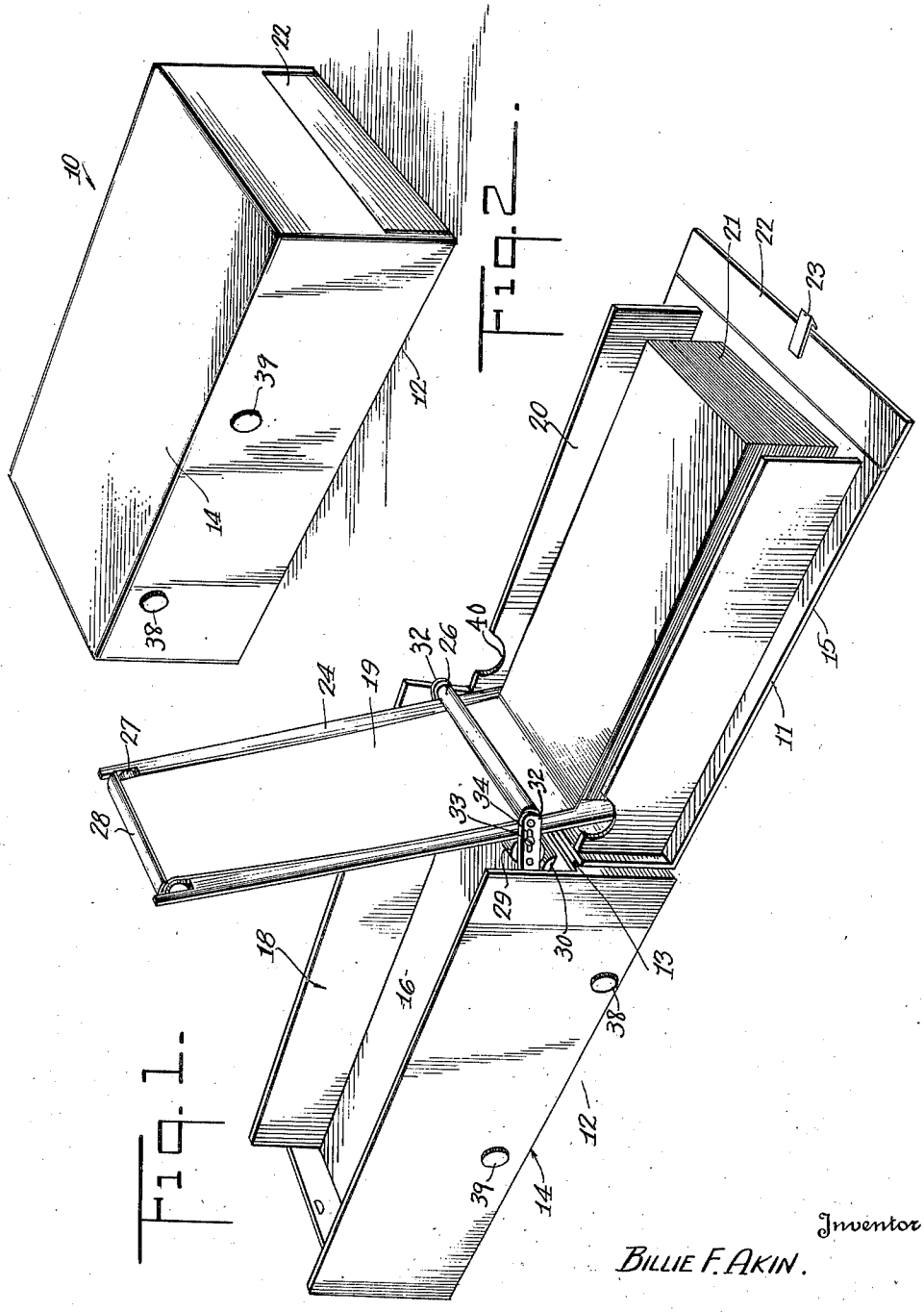


Fig. 2.

Fig. 1.

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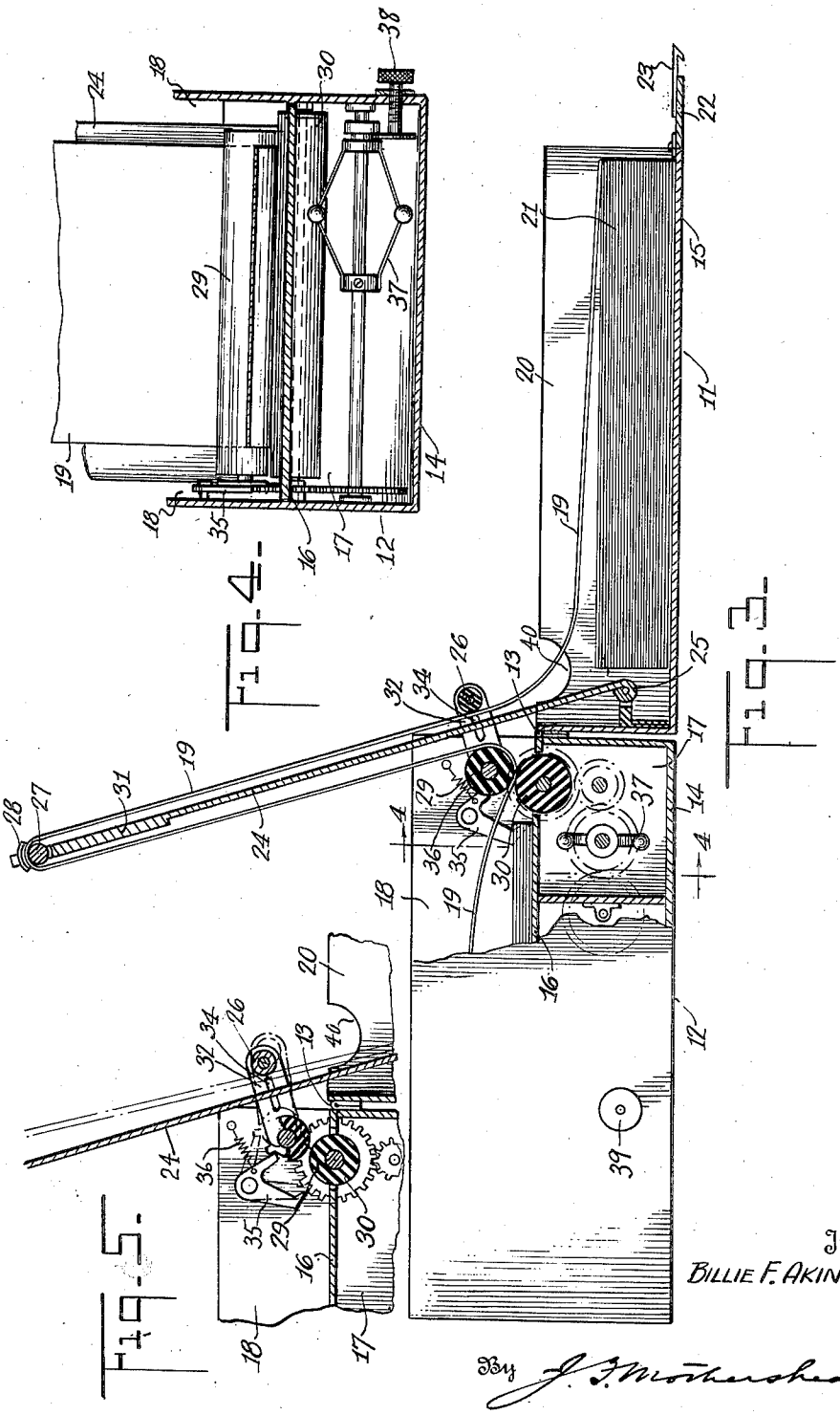


Fig. 4.

Fig. 3.

Fig. 5.

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Patented Oct. 1, 1940

2,216,334

UNITED STATES PATENT OFFICE

2,216,334

WEB FEEDING DEVICE

Billie F. Akin, Chattanooga, Tenn.

Application June 10, 1940, Serial No. 339,769

19 Claims. (Cl. 120—30)

(Granted under the act of March 3, 1883, as amended April 30, 1928; 370 O. G. 757)

The invention described herein may be manufactured and used by or for the Government of the United States for governmental purposes without the payment to me of any royalty thereon in accordance with the provisions of the act of April 30, 1928 (Ch. 460, 45 Stat. L. 467).

My invention relates to the improvements in manuscript manipulating devices, and more particularly to means for towing or feeding an indicia-bearing or imprinted web or elongated strip of material over a reading board, frame, or sight rack for desired intervals of time at governable uniform rates of speed with means for interrupting the movement of the web or strip as well as the actuating means.

The improvements are suitable for use in the reading and delivering of timed speeches with interrupting means, and is particularly adaptable to stenographic and transcription services, principally in connection with the use of rolls or zigzag folds of elongated webs and strips of writing material, as well as tapes, upon which shorthand characters or other writing indicia, columns of figures and the like are imprinted, and from which a stenographer, stenotypist, typist, student, clerk or other person is to transcribe, copy, read or the like.

The object of my invention is to provide a device of the character described, which is simple of construction, easy of operation, efficient, and within the price range of a student or clerical employee. A further primary object of the invention is to provide a device of light weight, small and portable which may be conveniently carried or moved to any desired place or position for operation.

A further object of the improvements is to provide feeding mechanism having readily adjustable means for governing the uniform and continuous rate of speed at which it is desired to have the strip-like imprinted material towed or fed over an unobstructed sight rack or reading frame which may be adjusted to most suitable angles or lines of vision.

A feature of simplicity and ease of operation resides in the provision of means for not alone interrupting or stopping the movement of the imprinted strip, but simultaneously stopping the actuating means to thereby conserve or prevent the waste or exhaustion of driving power. A still further object of the improvements is to provide means to reduce to a minimum the number of operations required for starting, interrupting and stopping the device, and to thereby minimize interruptions to the hand performances of a transcriber and diversions from the reader's point or line of sight.

With the foregoing and other objects in view, my invention resides in the combination of parts and in the details of construction hereinafter set forth and claimed, certain embodiments thereof having the characteristics of my invention, and by which the same may be practiced, being illustrated in the accompanying drawings in which—

Fig. 1 is a perspective view of the device in operative position;

Fig. 2, a view in perspective of the device as closed for portability;

Fig. 3, a sectionalized elevational view illustrating, in operative position, suitable actuating means for operating the device;

Fig. 4, a section taken at line 4—4 of Fig. 3; and

Fig. 5, an elevational section broken away to illustrate operative and inoperative (in dotted lines) positions, and details of suitable means for starting and stopping the device.

Any suitable housing, casing or support may be employed for the mounting of my feeding mechanism and by way of illustration a very practical form is shown on the drawings, particularly in Figs. 1 and 2, as comprising a closable box-like casing, generally indicated by character reference 10. This housing or casing consists of two compartments which generally resemble a box 11 and an enveloping lid 12, which lid compartment is of a depth substantially twice that of the box compartment and of a width somewhat greater than the box compartment. These two compartments are so hinged together, as at 13, that the top 14 of the lid compartment, when opened back, may rest on a plane substantially with that of the bottom 15 of the box compartment 11. These compartments are also hinged together to bring and retain cooperating elements, described hereinafter, into operative relation when the box-like housing is opened for operation of the device.

The lid compartment 12 is separated by a removable or hinged dividing member 16 into two units, one comprising a chamber 17 for the housing of gear trains, governing and actuating means, and the other a receiving compartment 18 for receiving the strip or web of material 19 dispensed through and by the feeding mechanism from the supply compartment 20 of the box 11. When the box-like casing is closed the lid chamber 17 is carried above the box compartment 20 and the side walls of the lid receiv-

ing compartment 18 pass down along the side walls of the box compartment. The space between the side walls of the box compartment and the lid compartment, created by the extra width in the lid compartment over that of the box compartment, will accommodate any gears or other elements of a more or less flat character which are mounted on the inner walls of the receiving compartment 18 above the lid dividing member 16. This arrangement allows the lid compartment to be closed without abutting the box compartment walls or interfering with a packet 21 or roll of strip-like material 19 which may be housed in and need not be removed from the supply compartment 20 for the closing or transportation of the device. A hinged drop-lid 22 may be provided at the end of the box compartment 11 in order that a packet or roll of material may be readily grasped for insertion and removal. Any suitable means, such as the spring latch 23, may be provided for locking the lid compartment 12 over the box compartment 11.

The foldable box-like housing illustrated and described as a suitable mounting for the actuating means may be constructed of any suitable relatively thin and light material as may be sufficiently sturdy to support the operating elements.

Having generally described a suitable housing and mounting, the feeding mechanism and other elements for the operation of the device comprises, among other elements, a suitably hinged or otherwise tiltable sight rack 24 which may be lifted from a substantially horizontal plane within the box compartment 11 and pivoted about its axis or fulcrum 25 to an upright position, tilting slightly rearwardly past the vertical. Means described hereinafter are provided to vary the tilt or angle of the sight rack to desired angles of vision. The strip-like or web material 19 is led from the supply compartment 20 up along the face of the sight rack 24, over the upper end thereof, thence downwardly along the back of the sight rack through towing or feeding means, from which the strip is fed into the receiving compartment 18.

A suitable guide, or tensioning means if desired, such as roller 26 may be positioned across and adjacent to the face of the sight rack 24 near the base or fulcrum thereof to cause the strip to be towed or fed close along the surface thereof, and if desired anti-friction means 27 and a guide 28 may be provided at the upper end of the sight rack to facilitate the movement of the strip thereover and retain its path of travel. By this arrangement ample reading area is provided on the upright surface of the sight rack between the guide roller 26 and the point at which the strip is directed over the end of the rack.

Suitable means for towing the strip over the sight rack and feeding it into the receiving compartment 18, comprises an idler roller 29, mounted on the sight rack across the back thereof and adjacent the lower end portion thereof, in combination with a driving roller 30 mounted across the lid compartment 12 and connected by suitable gear trains to means for rotatably actuating the same. Energy for this purpose may be suitably derived from a simple clock spring or an electric motor mounted within the chamber 17 of the lid compartment 12. The driven roller 30 and the idler roller 29 are so mounted that the strip fed between the rollers 29 and 30 will be brought into frictional contact with the driven roller 30 by the tilting of the sight rack rearwardly sufficiently to bring the idler roller into compressional relationship with the driven roller. The tiltable sight rack may be provided with a suitable weight 31 to bring about sufficient leverage on roller 29 to provide adequate compression for the maintenance of sufficient friction between the strip and the driving roller to cause the strip to be fed or towed along.

The mounting for the idler roller 29 across the rear face of the sight rack may comprise a pair of suitable brackets 32 provided with bearings for the roller shaft. These brackets are mounted across the edges of the sight rack by means of set screws 33 whose shanks pass through openings 34 in the brackets and into the edges of the sight rack. The openings 34 may be elongated slots whereby the position of the idler roller with respect to the sight rack may be adjusted to vary the angle of the rack to suit the reader. By this adjustable feature the compression between the rollers may be varied since the leverage of the sight rack is increased or decreased by the adjustment. The direction of compression between the rollers may also be varied by the latter adjustable features from, for example, a downward direction to a lateral direction. In this respect it may be noted that the sight rack, the idler roller and the extending adjustable roller mounting brackets may be considered a cantilever for pressing the strip into frictional contact with the driving roller and is claimed as such in appended claims.

As a substitute or supplement for the weight 31, a pawl or other holding means may be provided for holding the sight rack or idler roller in a position to maintain compression between the rollers. A very practical means for holding the sight rack in or out of a position of leverage effect upon the idler roller to hold it against the driving roller may consist of a reversible pawl or claw coupling at the fulcrum of the sight rack. Such a pawl or claw coupling should be adjusted, however, to allow a movement of the sight rack about its fulcrum, from a substantially horizontal position to a predetermined upright operative or inoperative position by the application of a slight amount of manual pressure to one or the other side of the rack. A suitable reversible pawl may comprise a pair of the commonly known and conventional complementary radially corrugated washers (not shown) which may be cooperatively mounted at the fulcrum of the sight rack, one held against rotation and the other rotatable by the movement of the sight rack. The give or spring of such washers and their corrugations will allow the corrugations of one washer to pass over those of the other and remesh by a slight amount of force.

The foregoing characteristics will allow the operator to interrupt the progress of the strip by a slight pull on the uppermost end or edge of the sight rack to move the sight rack one or more notches and release the compression between the idler and driving rollers. Likewise a slight push on the face of the sight rack will return the rollers into compressional relationship and cause the strip to resume its movement. This manual operation may be performed by the operator without requiring him to divert his eyes from an observed point or line of vision.

A further feature of novelty resides in the provision of a pawl, clutch, brake-shoe, or other means for engaging the gears or the shaft of the driven roller and normally hold the same against

rotation and which may be released, for example, by the abutment of the bracket **32** as the sight rack is tilted back into operative position. A suitable arrangement of this character is shown in the drawings as a pawl **35**, which is held into engagement with the actuating gear of the driving roller by means of a spring **36**, and is released from its holding effect by the force of the brackets **32**, in opposition to the force of the spring **36**, against an arm of the pawl. The withdrawal of the bracket from its abutting force against the pawl arm by the tilting of the sight rack allows the spring **36** to return the pawl into holding effect. This feature brings about the simultaneous stopping of the driving mechanism with the release of the compression between the rollers, or, in other words, simultaneously with the stopping of the movement of the strip. This action permits the conservation of actuating power and prevents the unnecessary exhaustion thereof during the interruption to the movement of the strip.

In order that the speed at which the strip is towed or fed over the sight rack may be regulated, stepped-up or slowed down to suit the transcriber, reader or other operator, an adjustable regulator may be provided. A suitable regulator is shown in Figure 4 as a governor **37** geared to the train of gears intermediate the initially driven gear and that of the driving roller. For convenience, the governor **37** may be adjusted by a thumb screw **38**, conveniently located at the side of the lid compartment **12**, which is operatively connected to open and close the governor.

If it is found desirable to utilize spring power for actuating the driving roller, the winding means such as a thumb screw or key **39** may be conveniently located at the side of the box where it is readily accessible to the operator.

It should be noted that the axis about which the driving roller is moved when the lid compartment **12** is folded over the box compartment **11**, namely the hinge **13**, is spaced from and on a plane above the axis about which idler roller is moved when the compartments are closed, namely the sight rack fulcrum. By this arrangement the paths of these rollers about their respective axes intersect to bring the rollers into compressional relationship but diverge radically when the rollers are moved during the closing of the compartments **11** and **12**. In other words the idler roller comes to rest within the box compartment **20** forwardly of the path of the driving roller. This will prevent the abutting or riding interference of the rollers in the closing of the box-like casing. Since the driving roller, or at least its shaft, is longer than the width of the box compartment, the walls of the box compartment are provided with cut-outs or slots **40** to accommodate the driving roller which would otherwise abridge and ride on the walls of the box compartment and prevent the closing thereof.

Having described and illustrated embodiments of my invention by which the same may be practiced, what I claim is:

1. In a strip scanning device, the combination of a support, a power actuated roller carried by said support, a cantilever sight rack pivotal about a point on said support, means for guiding a strip over the face of said sight rack, and means acted upon by said cantilever sight rack for releasably holding said strip in frictional contact with said roller.

2. In a strip scanning device, the combination of a support, a roller mounted upon said support, means for driving said roller, means for normally holding said roller against rotation, a tiltable sight rack, means for guiding a strip over the face of said sight rack, means functioning by the tilting of said sight rack to a predetermined reading position for releasing said roller holding means, and means functioning by the aforesaid positioning of said sight rack for holding a strip in frictional contact with said roller.

3. In a strip scanning device, the combination of a support, a roller mounted upon said support, means for driving said roller, speed adjustable means for said roller, means for normally holding said roller against rotation, a tiltable sight rack, means for guiding a strip over the face of said sight rack, means functioning by the tilting of said sight rack to a predetermined reading position for releasing said roller holding means, and means functioning by the aforesaid positioning of said sight rack for holding a strip in frictional contact with said roller.

4. In a web feeding device the combination of a driving roller, a second roller and support therefor, said second roller positioned to press a web against the driving roller, a cantilever sight rack tiltably attached to the support for said second roller and adapted to press said second roller and web into contact with the driving roller when said sight rack is in normal reading position, and guides upon said sight rack and support for guiding a web over the face of the sight rack and between said rollers.

5. In a web feeding device the combination of a driving roller, a second roller and support therefor positioned to press a web against the driving roller, a cantilever sight rack pivotally attached to the support for said second roller and adapted to press said second roller and web into contact with the driving roller when said sight rack is in normal reading position, guides upon said sight rack and support for guiding a web over the face of the sight rack and between said rollers, and means carried by said sight rack for starting and stopping the driving roller.

6. In a web feeding device, the combination of a driving roller, a second roller, a tiltable sight rack engaging said second roller and adapted to move said second roller into and out of compression with said driving roller when said sight rack is moved, respectively, into and from a predetermined reading position, and guides for guiding a web over said sight rack and between said rollers.

7. In a web feeding device the combination of a driving roller, a cantilever sight rack pivotally mounted in close proximity to said driving roller, bearings carried by said sight rack, an idler roller mounted in said bearings in a position to engage a web and press the same against said driving roller when said sight rack is in normal reading position, and guides upon said sight rack for guiding a web over the face of the sight rack and between said rollers.

8. In a web feeding device, the combination of a driving roller, a cantilever sight rack hingedly mounted in close proximity to said driving roller, an idler roller mounted to engage a web and press the same against said driving roller when said sight rack is in normal reading position, guides upon said sight rack for guiding a web over the face of the sight rack and between said rollers, and means for adjusting the direction of pressure of said idler roller upon said driving roller.

9. In a web feeding device, the combination of a driving roller, a cantilever sight rack tiltably

mounted in close proximity to said driving roller, an idler roller mounted to engage a web and press the same against said driving roller when said sight rack is in normal reading position, guides upon said sight rack for guiding a web over the face of the sight rack and between said rollers, and means for adjusting the normal sight angle of the sight rack.

10. In a web feeding device, the combination of a driving roller, a cantilever sight rack pivotally mounted in close proximity to said driving roller, an idler roller mounted on said sight rack in a position to be pressed against said driving roller when the sight rack is in normal reading position, guides upon the sight rack for guiding a web over the face of the sight rack and between said rollers, and adjustable means for varying the pressure of the idler roller upon the driving roller.

11. In a strip scanning device the combination of a plurality of adjacent compartments for holding the strip prior to and after inspection, a strip feeding roller located within said receiving compartment, a cantilever sight rack located between said compartments, and means carried by said sight rack for guiding said strip and holding the same in contact with said feeding roller.

12. In a strip scanning device the combination of adjacent storage and receiving compartments for holding the strip prior to and after inspection, a strip feeding roller located to feed a strip into said receiving compartment, a sight rack pivotally mounted between said compartments, means upon said sight rack for guiding a strip over the face thereof, and means upon said sight rack for releasably holding a strip in frictional contact with said roller and for holding said sight rack at predetermined angles to the line of vision.

13. In a strip scanning device, the combination of storage and receiving compartments for the strip, a strip feeding roller and means for driving the same located upon one of said compartments, a hinged sight rack mounted adjacent to one of the compartments, means upon said sight rack for guiding the strip, and means upon said sight rack adapted to engage the feeding roller for holding the sight rack at predetermined angles of vision and for pressing said strip into engagement with said feeding roller.

14. In a strip scanning device the combination of folding hinged complementary adjacent storage and receiving compartments for holding the strip prior to and after inspection, a strip feeding roller and means for driving the same located within said receiving compartment, a hinged sight rack located between and foldable within said storage compartment, means upon said sight rack for guiding said strip over the face thereof, and means upon said sight rack adapted to engage said feeding roller for holding said sight rack at predetermined yet adjustable angles to the line of vision and for simultaneously pressing said strip into engagement with said feeding roller when said sight rack is in the latter position, said sight rack separating the scanned strip from the unscanned strip when said complementary compartments are folded together.

15. In a strip scanning device, the combination of a tiltable sight rack, a power actuated roller and an idler roller, one of said rollers being mounted upon said tiltable sight rack and held in compressional relationship with the other roller by the over-balancing weight of the sight rack in one direction and released from compressional relationship with the said other roller by the over-balancing of the sight rack in the opposite direction, and means for guiding the strip over the sight rack and between said rollers.

16. In a strip scanning device, the combination of a tiltable sight rack, a power actuated roller and an idler roller, one of said rollers being mounted upon said tiltable sight rack and held in compressional relationship with the other roller by the over-balancing weight of the sight rack in one direction and released from compressional relationship with the said other roller by the over-balancing of the sight rack in the opposite direction, means for guiding the strip over the sight rack and between said rollers, means normally holding said power actuated roller against rotation, and means operable to release said roller holding means by and simultaneously with the tilting of the sight rack to bring said rollers into compressional relationship.

17. In a strip scanning device, the combination of parallel rollers carried by a support, each roller being rotatable about its own axis and each moveable about a separate axis laterally displaced with respect to its concentric axis, said laterally displaced axes being spaced from each other in a manner whereby the paths of movement of the rollers thereabout intersect at least at one point to bring said rollers into compressional relationship and diverge at another point at least the width of one of said rollers to release said compressional relationship and to bring said rollers into non-interfering positions, means for rotatably actuating one of said rollers, and means for guiding a strip between said rollers.

18. In a strip scanning device, the combination of parallel rollers carried by a support, each roller being rotatable about its own axis and each moveable about a separate axis laterally displaced with respect to its concentric axis, said laterally displaced axes being spaced from each other in a manner whereby the paths of movement of the rollers thereabout intersect at least at one point to bring said rollers into compressional relationship and diverge at another point at least the width of one of said rollers to release said compressional relationship and to bring said rollers into non-interfering positions, means for rotatably actuating one of said rollers, a sight rack tiltable about one of said laterally displaced axes simultaneously with one of said rollers, and means for guiding a strip over said sight rack and between said rollers.

19. In a strip scanning device, the combination of parallel rollers carried by a support, each roller being rotatable about its own axis and each moveable about a separate axis laterally displaced with respect to its concentric axis, said laterally displaced axes being spaced from each other in a manner whereby the paths of movement of the rollers thereabout intersect at least at one point to bring said rollers into compressional relationship and diverge at another point at least the width of one of said rollers to release said compressional relationship and to bring said rollers into non-interfering positions, a sight rack tiltable about one of said laterally displaced axes simultaneously with one of said rollers, means connecting one of said rollers for rotatably actuating the same, holding means normally preventing the rotation of the latter one of said rollers, means functioning by the tilting of said sight rack to predetermined upright reading positions for releasing said holding means, and means for guiding a strip over said sight rack and between said rollers.

BILLIE F. AKIN.