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TICKET PRINTER

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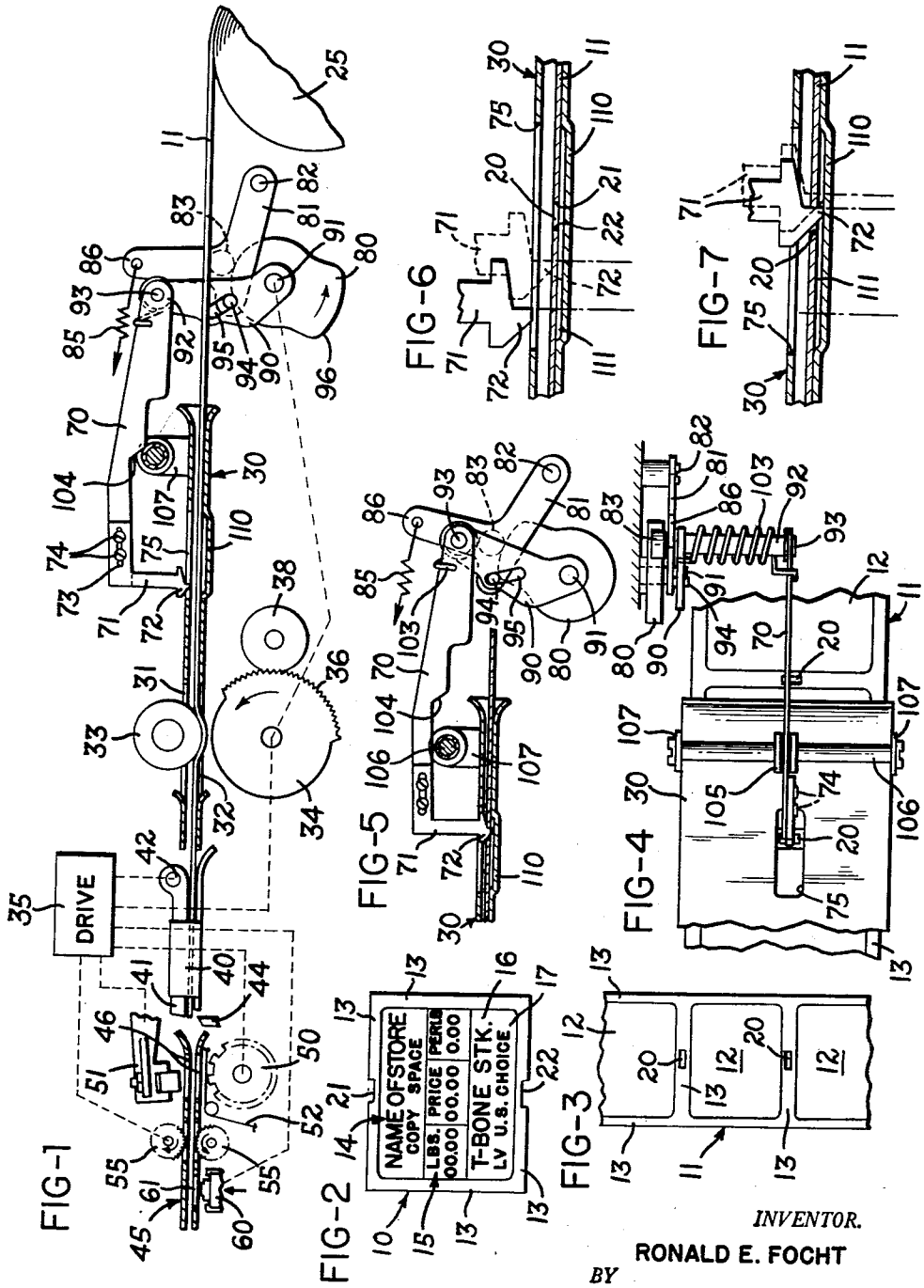


FIG-1

FIG-2

FIG-3

FIG-4

FIG-5

FIG-6

FIG-7

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TICKET PRINTER

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This invention relates generally to apparatus and methods of effecting accurately controlled feeding of a strip of tickets, labels or the like.

The invention has particular relation to apparatus and methods for intermittently advancing, printing and issuing successive tickets, labels or the like from a strip thereof, and it has special application to such apparatus and methods for handling such strips wherein the individual tickets or like sections of the strip are specifically identified on the strip, as by individual design or preliminary printing, to such extent that the final printing thereon in conjunction with issuance thereof must be accurately registered lengthwise of the strip.

As an illustrative example of the subject matter of the invention, it is explained hereinafter in connection with a scale which is constructed as a complete unit to weigh food products or other commodities and to issue a printed ticket bearing thereon both the weight and the computed value of the weighed material. Scales of this character are particularly useful for food markets of the self-service type selling commodities such as meat in prepackaged form, with the printed label being attached to the package before the package is placed in the display case ready for selection by the customer. It is valuable from the standpoint of advertising, for example, that the printed ticket or label received by the customer clearly identify the store, and this value is further enhanced by the use of attractive designs and/or color combinations on the printed ticket. It is difficult, however, as a practical matter to do all the printing necessary to this end within the scale or other issuing unit.

The advantages outlined above can be achieved without the attendant practical difficulties if the ticket is preprinted with the desired advertising and/or design material so that the scale is required only to print the results of the weighing operation and other variable data such as the identity and/or grade of the particular commodity. This in turn, however, introduces relatively strict requirements of accuracy for the feeding of the ticket strip, since the data printed by the scale should register properly with respect to the printed material. Thus unless feeding of the ticket strip is in accurately controlled increments of one ticket at a time, the successive ticket sections of the strip may progressively get out of register with the printing station of the scale, with resulting possible spoilage of tickets.

In the Allen Patent No. 2,824,736, issued February 25, 1958 to the assignee of this application there is described an arrangement for accurately feeding a ticket strip in increments of a single ticket wherein the feeding mechanism is operated in one direction to advance the strip a distance slightly greater than a single ticket length, and then is operated in the reverse direction to retract the strip and to establish accurate registration and indexing of the ticket with a relatively fixed stop receivable within successive perforations in the strip. Similarly accurate registration of each ticket is achieved in accordance with the present invention by causing the ticket to be retracted by a movable strip engaging member which operates upon the completion of the forward drive and which also serves as the stop for indexing the strip preparatory to cutting.

It is a primary object of the invention to provide new and improved apparatus for feeding a strip composed of

multiple tickets, labels or like sections which will effect the feeding of the strip in accurately controlled increments such that only a predetermined precise length of the strip will be advanced during each feeding cycle, and which apparatus will at the same time be comparatively simple and compact in construction and will possess minimum requirements from the standpoint of maintenance.

An additional object of this invention is to provide a strip feeding apparatus as outlined above which includes mechanism for advancing a ticket strip in a single cycle of operation slightly further than the length of an individual ticket and for engaging the strip at individual perforations to move the strip through such engagement in a reverse direction to an indexed position corresponding to a whole multiple of a full ticket length.

It is also an object of the invention to provide strip feeding apparatus as outlined above which is adapted for incorporation in existing ticket printing machines for handling unprinted ticket strips and which will enable the converted machine to handle a preprinted ticket strip and to print and to issue successive tickets therefrom on which additional data is printed in the machine in consistently accurate registered relation with the preprinted portions of the ticket.

Other objects of the invention will be apparent from the following description, the accompanying drawings and the appended claims.

In the drawings:

FIG. 1 is a somewhat diagrammatic view illustrating strip feeding, printing and issuing apparatus constructed in accordance with the invention;

FIG. 2 is a somewhat diagrammatic view illustrating an example of a single ticket of the type issued by the apparatus of FIG. 1;

FIG. 3 is a view similar to FIG. 2 showing a fragment of the strip of tickets handled by the apparatus of FIG. 1;

FIG. 4 is a fragmentary view of the upperside of a portion of the indexing mechanism of FIG. 1;

FIG. 5 is a fragment of FIG. 1 showing a moved position of the indexing mechanism;

FIG. 6 is an enlarged fragment of FIG. 1 showing the advanced position of the strip prior to indexing and its relation to the indexing head; and

FIG. 7 is a view of the parts of FIG. 6 showing the moved position of the strip into the indexed position.

Referring to the drawing, which illustrates preferred embodiments of the invention, FIG. 2 shows an illustrative example of a single ticket **10** of the type issued by a scale operating in conjunction with the apparatus of the invention for use by a food market in prepackaging meat. As shown, such ticket may be preprinted to carry the name of the store and a variety of other copy selected in accordance with individual preference. Such preprinted material may appear on each successive ticket portion of an elongated strip **11** of blank tickets as shown in FIG. 3. Each ticket portion **12** on the strip may also be provided with a decorative border **13** of a contrasting color or other design, and the preprinting of the strip may also include the name of the store as indicated at **14** as well as the headings for the weight, price and price-per-pound as shown at **15** in FIG. 2.

With each ticket portion **12** thus specifically designated on the strip 11 by the preprinted matter, the ticket issuing portion of the scale assembly is required only to print the identity and grade of the commodity as indicated at **16** and **17** in FIG. 2, together with its weight, price-per-pound and computed value. On the other hand, with the major part of the ticket or label preprinted, feeding of the ticket strip must be accurately controlled in order to assure that the final printing in conjunction with the weighing operation will always be accurately in register with the spaces intended therefor for the successive in-

dividual tickets. The present invention is especially directed to the accomplishment of this object.

In accordance with the invention, the ticket strip **11** is provided with a series of perforations or slots **20** which are located in accurately spaced relation lengthwise of the strip, centrally in the margin between adjacent tickets so that the spacing of each adjacent pair of perforations is accurately equal to the desired dimension of the individual ticket **10** lengthwise of the strip. While the configuration of the individual perforations is primarily a matter of choice, they are shown as rectangular slots each having a forward leading edge **21** and a trailing edge **22**, and the individual tickets **10** are indicated as severed along approximately the middle of these slots.

The mechanism for feeding and printing the tickets is shown in FIG. 1 as including a supply roll **25** from which the ticket strip **11** is fed through an elongated chute **30** having slots **31** and **32** in the upper and lower walls thereof through which the strip is engaged for feeding by a rubber pressure roll **33** in cooperation with a driven cylinder **34** operated intermittently by the main drive which is indicated diagrammatically at **35** and which may, for example, be of the construction shown in Robertson Patent No. 2,056,486, issued October 6, 1936 and in the Goodbar et al. Patent No. 2,889,769, issued June 19, 1959. The nature of the drive **35** is not critical for the purpoes of the invention and operates to provide one full revolution of the cylinder **34** for each feeding cycle of the apparatus. The feeding action of the cylinder **34**, however, occupies less than the full revolution and is controlled by knurled or otherwise raised or roughened feed rail portions **36** of the cylinder **34** which are coordinated with the actual length of each ticket portion **12** to provide a feeding stroke for the strip which is greater than the length of a single ticket.

Thus each time the drive **35** is operated, the cylinder **34** will make one complete revolution, and during the interval while its feed rail portions **36** are in pressure engagement with the strip **11** and roll **33**, the strip will be fed forward, but during the remainder of the revolution of the cylinder **34**, there will be no forward feeding of the strip. It is understood that the cylinder **34** may also have incorporated therein type wheels or an electro, which may be employed to print some of the desired data on each ticket **10**, such particularly as the grade of the commodity and/or other identifying data of the type indicated at **17** in FIG. 2. A detailed disclosure of suitable such printing mechanism is found in Robertson Patent No. 1,816,263, issued July 28, 1931, and its cooperating inking roller is shown at **38**.

From the feeding chute **30** the ticket strip **11** passes to the knife chute **40** which is carried by a knife **41** pivotally mounted at **42** for cooperative movement towards and away from a stationary cutoff bar **44** to shear successive tickets from the strip. Beyond the knife chute **40** is a further guide chute **45** which is slotted at **46** to provide a printing station receiving cooperating printing wheels **50** and an impression hammer **51** for printing the weight, price and price-per-pound of the weighed commodity on successive ticket blanks **12**, the printing ribbon for the impression hammer **51** being indicated fragmentarily at **52**.

Movement of the printed ticket beyond the printing station is under the control of a pair of ejector wheels **55** operating in additional slots in the chute **45** beyond the printing station. FIG. 1 also shows a key **60** located beyond the ejector wheels **55** for printing the commodity designation **16** on the ticket through a slot **61** in the underside of the chute **45**. The mechanism by which these several parts are set and operated may be automatically controlled by the weighing action of the scale or may be of any convenient manually actuated character and forms no part of the present invention. A suitable such mechanism for the ejector rolls, knife and other

associated parts is shown, for example, in the above noted Robertson and Goodbar et al. patents.

In accordance with the present invention, accurate registration of each successive ticket **10** with relation to the printing station and the cut-off bar **44** is established by control of the feeding of the strip **11** in such manner that during each cycle of the roll **33** and cylinder **34**, the strip is first fed forward a distance slightly greater than the length of a single ticket blank **12**. Then during the remainder of the cycle, the strip **11** is moved in the reverse direction by a movable stop mechanism which engages one of the slots **20** and moves therewith to an indexed position accurately correlated with the length of one or more complete ticket blanks such that the shearing action by the knife **41** will take place at the desired point between the leading pair of tickets on the strip.

The movable stop mechanism includes an arm **70** from which a finger **71** depends adjacent the path of movement of the strip **11** and carries a strip-engaging hook **72** on the extended end thereof. The finger **71** includes a slotted portion **73** which is adjustably secured to the arm **70** by a pair of screws **74**. The finger **71** is arranged to move from a dwell position shown in full lines in FIG. 6, in a direction parallel to the line of movement of the strip **11** subsequent to completion of the advance feeding of the cylinder **34**. During this movement, the slot-engaging hook **72** is arranged to engage the adjacent slot **20** of the strip **11** at its trailing edge **21** through an access opening **75** in the chute **30** to cause the strip **11** to move in a reverse direction into the predetermined indexed cutting position.

Means for effecting such movement of the arm **70** and finger **71** includes a cam **80** connected to the drive **35** so as to complete revolution during each cycle of operation. The rotation of the cam **80** is correlated with the rotation of the strip drive cylinder **34** to provide reverse movement of the strip **11** by the hook **72** at the conclusion of the forward drive effected by the cylinder **34**. A cam follower crank **81** is pivoted at **82** and includes a follower roller **83** arranged to ride on the surface of the cam **80**. The roller **83** is held in contact with the cam **80** by a tension spring **85** secured to an extended arm portion **86** of the follower **81**.

A draw link **90** is connected for pivotal movement on the cam **80** at a pivot **91** and further includes an extending pin **92** forming a pivotal connection **93** with the arm **70**. Means connecting the link **90** for movement in response to the movement of the follower **81** includes a pin **94** extending normal to the follower **81** and projecting into a cooperating slot **95** in the link **90**. The pin **94** and slot **95** are arranged so that the arcuate movement of the follower **81** on the lobe **96** of the cam **80** causes a reverse movement of the arm **70**, carrying the hook **72** to an indexed position as shown by the broken line view in FIG. 7. The indexed position is determined by the profile of the lobe **96** and by the adjusted position of the finger **71** on the arm **70**, and is therefore the same for each cycle of operation.

Upon the initial reverse movement of the arm **70**, the finger **71** is guided downwardly into contact with the strip **11** from its dwell position to a position in engagement with the upper surface of the strip ahead of the advanced position of the adjacent slot **20**, as shown in full lines in FIG. 6. The downward movement of the hook **72** is effected by a torsion spring **103** on the pin **92**, and the arm **70** is guided during initial movement by the coaction of a cam surface **104** on the underside of the arm with a cooperating guide collar **105**. The collar **105** is mounted on a transverse rod **106** which is, in turn, supported above the chute **30** by a pair of upwardly extending support arms **107**. Continued rearward movement of the arm **70** by means of the pin **94** and slot **95** carries the hook **72** along the upper surface of the strip **11** until it drops through the adjacent perforation **20** as shown in

FIG. 7. The cam surface **104** and the collar **105** are therefore guide means which provide for the movement of the hook **72** from its dwell position onto the upper surface of the strip **11** ahead of the advanced position of the adjacent perforation.

As is most clearly shown in FIGS. 6 and 7, a portion of the chute **30** is depressed at **110** to provide a space **111** below the strip **11** into which the hook **72** may project when in engagement with the slot **20**. The depressed portion **110** of the chute **30** also provides a support or bearing surface for the hook **72** when in engagement with the slot **20** of the strip.

The rotation of the cam **80** and the relation of the lobe **96** of the follower **83** is such that the hook **72** draws the strip **11** into the indexed position and remains in engagement with the perforation **20** during the cutting operation. The parts are now in the position as shown in FIG. 5 corresponding to the indexed position of the strip **11**. At the conclusion of the cutting operation by the knife **41**, the continual rotation of the cam **80** by the drive **35** returns the finger **71** to its dwell position as shown in FIG. 1 preparatory to the initiation of a new cycle of operation.

It is therefore seen that this invention provides a positive mechanism for accurately positioning successive ticket portions of a strip of tickets for printing and cutting, as desired. It is apparent that the particular configuration of the individual perforations **20** is not controlling provided each perforation has a trailing edge portion **22** located in the same spaced relation with the printed material on the associated ticket portion of the continuous strip. Accordingly, the term "perforation" as used herein is not limited to any particular configuration or size and include slots and other shapes which will provide such desired relationship between the leading edges of the successive perforations and the printed matter appearing on the successive ticket portions of the strip.

While the form of apparatus herein described constitutes a preferred embodiment of the invention, it is to be understood that the invention is not limited to this precise form of apparatus, and that changes may be made therein without departing from the scope of the invention which is defined in the appended claims.

What is claimed is:

1. Apparatus of the character described for effecting accurately controlled incremental feeding of a continuous strip having therein a plurality of perforations spaced lengthwise thereof by predetermined uniform distances, comprising feeding means for said strip including a feed roll positioned for pressure engagement with said strip, intermittently operable means establishing a cycle of operation for driving said feed roll to effect advance feeding of said strip through a distance slightly greater than the distance between each adjacent pair of said perforations, a movable arm located adjacent the path of said strip having a hook movable in successive said perforations, arm drive means connected for operation by said feed roll and effective upon the completion of said advance feeding during each said cycle for moving said hook into engagement with the surface of said strip in advance of an adjacent said perforation and for moving said hook in a reverse sense on said surface and into said adjacent perforation for effecting limited reverse feeding of said strip into an indexed position corresponding to a total net movement of substantially the spaced length between said perforations.

2. Apparatus of the character described for effecting accurately controlled incremental feeding of a continuous strip having therein a plurality of perforations spaced lengthwise thereof by predetermined uniform distances, comprising drive means, a feed roll connected to said drive means positioned for pressure engagement with said strip and arranged to effect advance feeding of said strip through a distance slightly greater than the distance between each adjacent pair of said perforations, a movable finger located adjacent the path of said strip having a hook thereon adapted for movement in successive said perforations, a cam connection for rotation by said drive means, an arm operatively connecting said cam with said finger for reciprocating said hook upon the rotation of said cam, means for guiding said hook into engagement with said strip in advance of an adjacent said perforation and providing for movement of said hook into said adjacent perforation, and said cam being proportioned to effect limited reverse feeding of said strip by said hook into an indexed position corresponding to a total net movement of substantially the spaced length between said perforations.

3. In a machine for printing at a printing station on successive ticket portions of a continuous strip of such tickets and severing successive tickets from said strip, apparatus for effecting accurately predetermined register of each such ticket with such printing station, comprising a strip of tickets having therein a plurality of perforations spaced lengthwise of said strip by distances accurately equal to the dimension of each said ticket lengthwise of said strip, drive means having a predetermined cycle of operation, strip feeding means connected in driven relation to said drive means for effecting intermittent advance feeding of said strip a distance slightly greater than a single said ticket length for each said cycle of said drive means, and a stop mechanism including a hook movable onto the surface of said strip and into drive engagement with successive said perforations and including a driving connection to said drive means for operation subsequent to said advance feeding of said strip during each said cycle, said stop mechanism further including means for guiding said hook for movement onto the surface of said strip ahead of the advanced feed position of the adjacent perforation providing for engagement with said adjacent perforation to effect reverse feeding of said strip by said hook into an indexed position corersponding to a total net movement of said strip of substantially a said ticket length.

4. In a machine for printing at a printing station on successive ticket portions of a continuous strip of such tickets and severing successive tickets from said strip, apparatus for effecting accurately predetermined register of each such ticket with such printing station, comprising a strip of tickets having therein a plurality of perforations spaced lengthwise of said strip by distances accurately equal to the dimension of each said ticket lengthwise of said strip, one-way drive means having a predetermined cycle of operation, strip feeding means connected in driven relation to said drive means for effecting intermittent advance feeding of said strip a distance slightly greater than a single said ticket length for each said cycle of said drive means, a movable hook positioned adjacent said strip and occupying a normal dwell position in advance of an adjacent ticket perforation subsequent to said advance feeding and aranged to engage said adjacent perforation upon reverse movement of said hook, a cam connected for one-way rotation by said drive means, an arm operatively connecting said cam with said hook, and guide means on said arm providing for movement of said hook from said dwell position to a position on the surface of said strip ahead of the advanced position of said adjacent perforation and for subsequent engagement with said adjacent perforation at the conclusion of said advance feeding to move said strip into an indexed printing and cutting position.

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2,824,736	Allen	Feb. 25, 1958