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Kodis

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[54] **MULTIPLE SHEET TICKET PRINTER**

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[73] Assignee: **Di/An Controls, Inc.,** Boston, Mass.

[22] Filed: **May 13, 1974**

[21] Appl. No.: **469,354**

Related U.S. Application Data

[63] Continuation of Ser. No. 300,144, Oct. 24, 1972, abandoned.

[52] **U.S. Cl.** **101/69;** 83/602; 101/93.28; 101/227

[51] **Int. Cl.** **B41f 13/58;** B41f 13/60; B41j 9/10

[58] **Field of Search** 101/66–69, 101/226, 227, 93.26; 83/602

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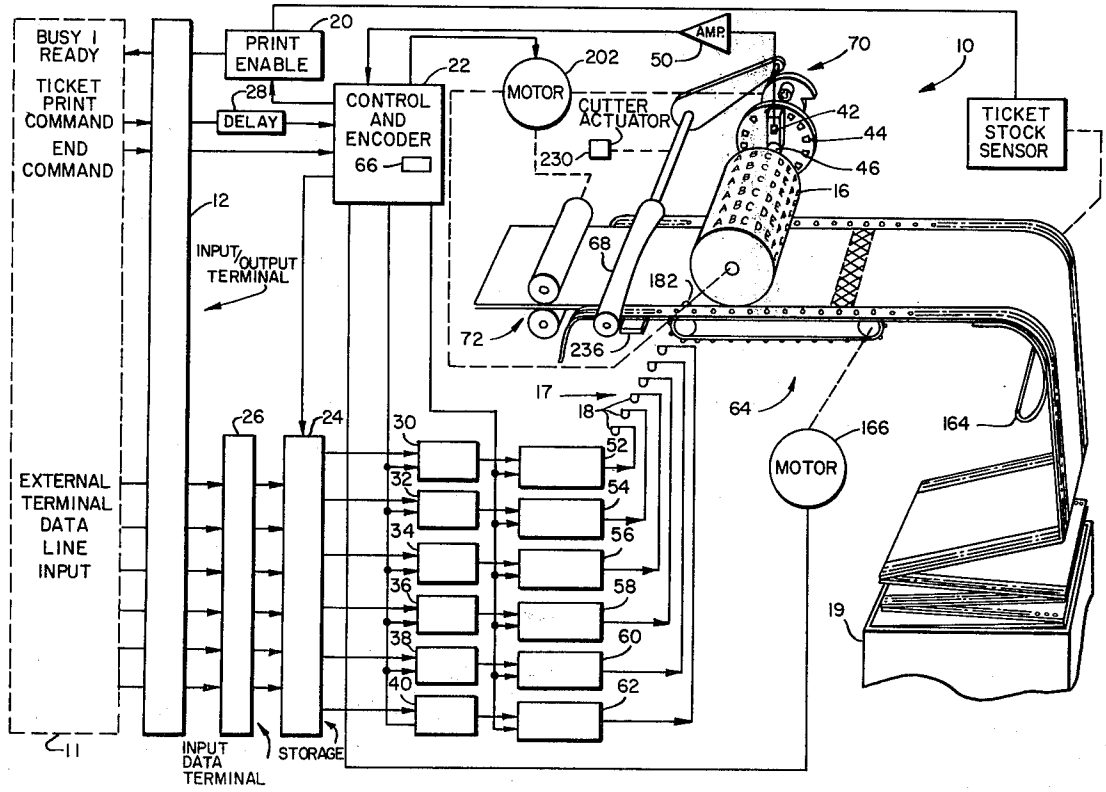
[57] **ABSTRACT**

A device comprising a rotatable print cylinder having rows of raised symbols disposed about its periphery in arcuate columns and an impactor assembly having ballistic elements cooperating with each row of raised symbols for columnar printing of selected symbols in rows on an endless web of multiple sheet ticket stock. The sheets are bound at selected intervals and are formed with sprocket holes disposed in spaced parallel relationship with the longitudinal axis at the margins thereof. The ticket stock is advanced into engagement with a rotating cutter assembly and into registration with the print drum and ballistic elements by means of a sprocket drive mechanism. The rotating cutter assembly separates the sprocketed margins from the ticket body. Symbols are printed when selected ballistic elements urge the ticket stock against selected raised symbols as the ticket is incrementally advanced by the sprocket drive mechanism, certain ones of the sheets being provided with a carbon backing. Upon completion of the printing cycle, the ticket stock is sheared by a solenoid actuated rotary cutter. Thereafter, the printed ticket is propelled from the device by means of an ejection mechanism.

3 Claims, 9 Drawing Figures



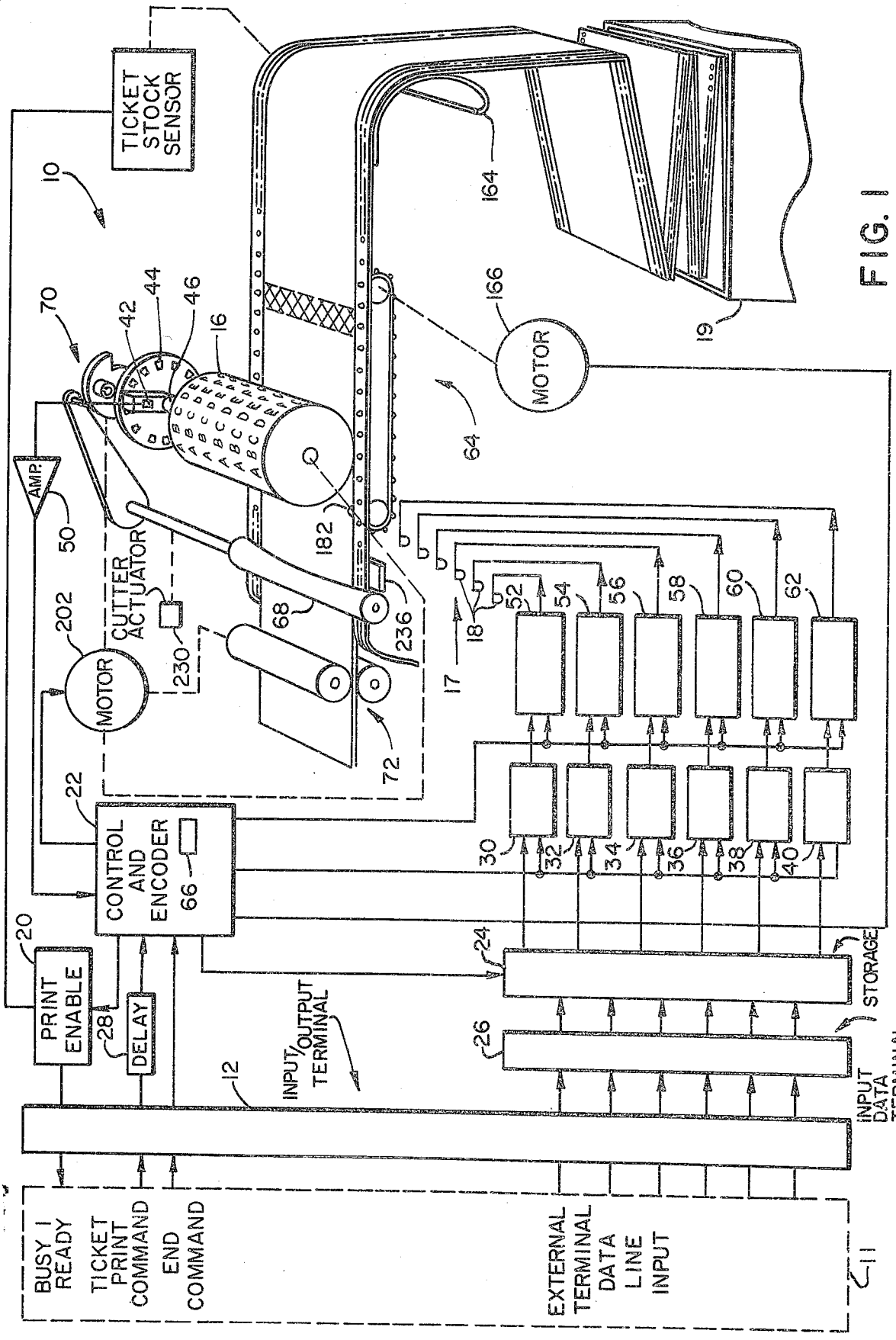

TICKET STOCK SENSOR
10
164
166
MOTOR
19
64
70
42
44
46
16
AMP
50
CUTTER ACTUATOR
182
68
236
72
202
MOTOR
230
17
18
52
54
56
58
60
62
30
32
34
36
38
40
22
CONTROL AND ENCODER
66
20
PRINT ENABLE
28
DELAY
24
STORAGE
26
INPUT/OUTPUT TERMINAL
12
INPUT DATA TERMINAL
BUSY / READY
TICKET PRINT COMMAND
END COMMAND
EXTERNAL TERMINAL DATA LINE INPUT
11

FIG. 1

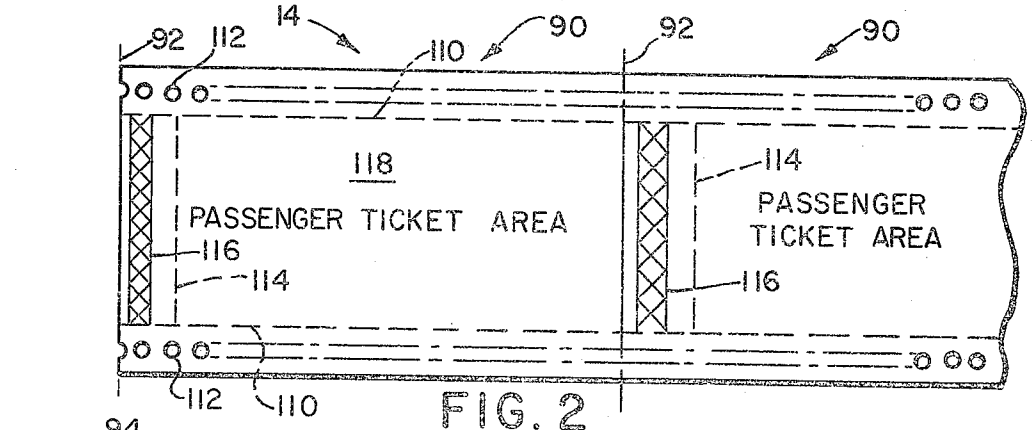


FIG. 2

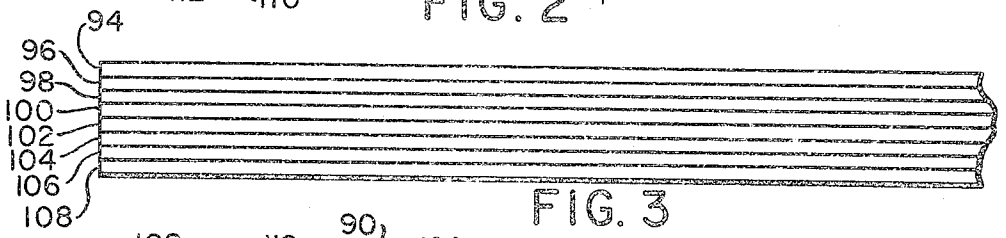


FIG. 3

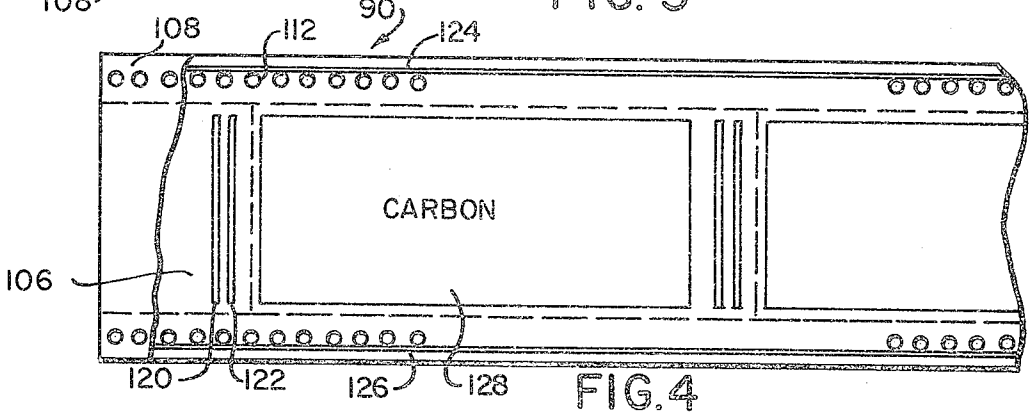


FIG. 4

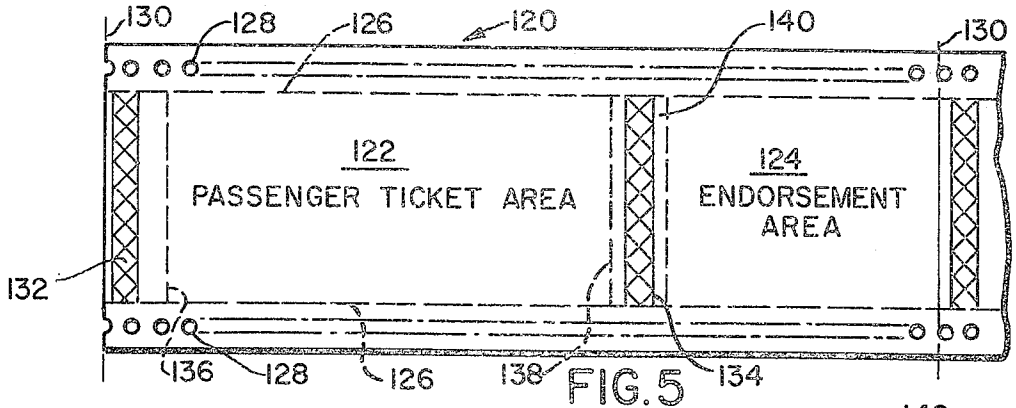


FIG. 5

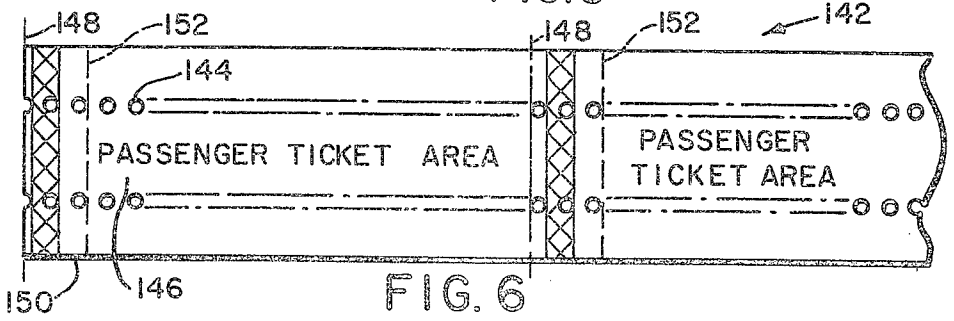


FIG. 6

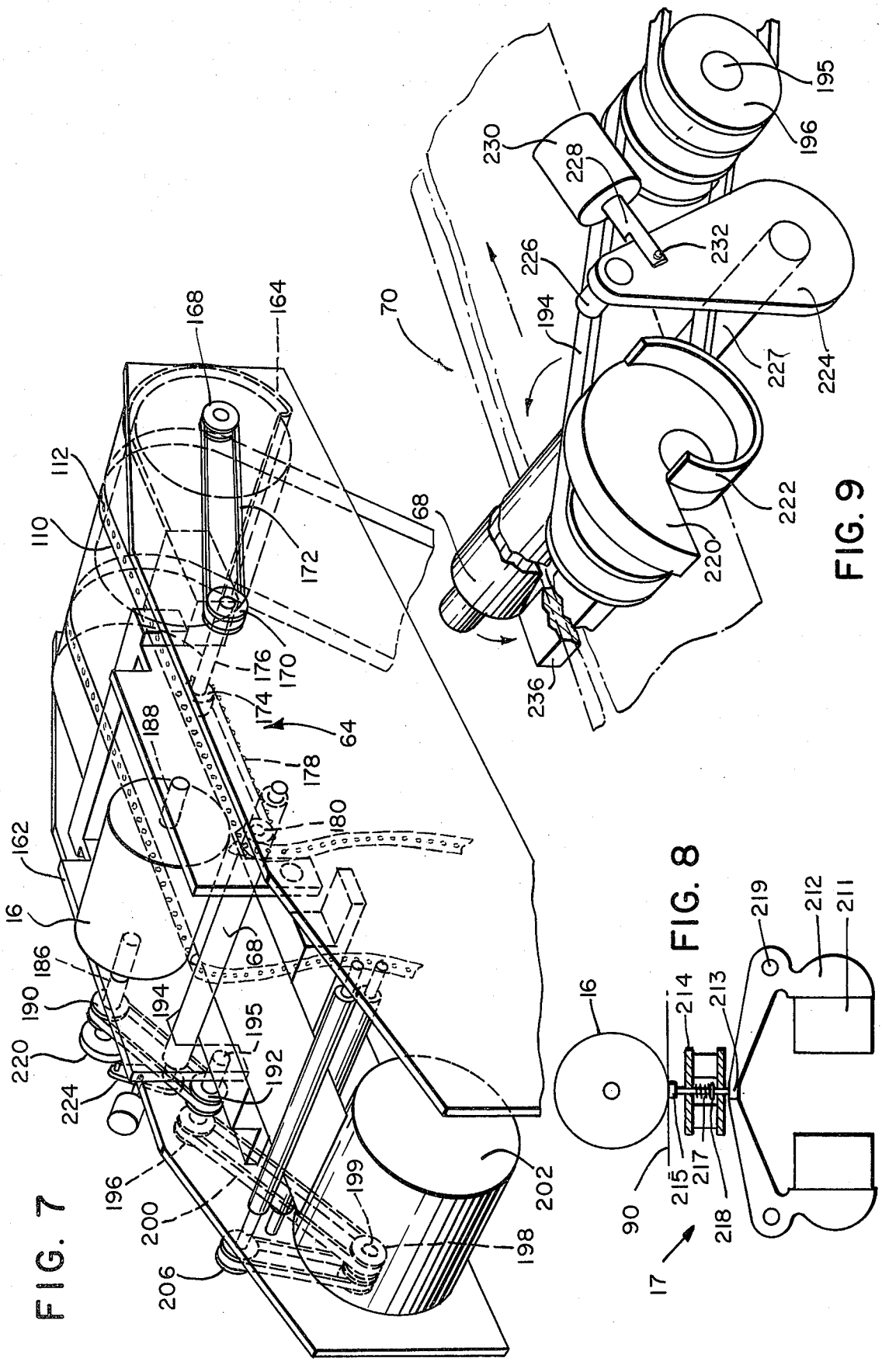


FIG. 7

FIG. 8

FIG. 9

MULTIPLE SHEET TICKET PRINTER

This is a continuation, of application Ser. No. 300,144, filed Oct. 24, 1972 now abandond.

BACKGROUND OF THE INVENTION

1. Field of Invention

The present invention relates to printing devices and, more particularly, is directed towards a high speed rotary ticket printer for multiple sheet tickets.

2. Description of the Prior Art

High speed rotary printers are well known in the art as a means for printing the output of an electronic computer on ticket stock. In one type of ticket printer, the ticket stock is fed into a print gate by means of a rotating drum which is energized at predetermined increments. Such printers have suffered from the disadvantage that, when multiple sheet tickets are used, the rotating drum tends to buckle some of the sheets. Another disadvantage found in prior art ticket printers is the use of scissor-type cutters which require precise alignment and frequent resharpening. It is apparent that a need exists for improvements in multiple sheet, high speed rotary ticket printers.

SUMMARY OF THE INVENTION

It is an object of the present invention to provide a multiple sheet ticket printer which does not suffer from the heretofore mentioned disadvantages. The ticket printer comprise a rotatable print cylinder having rows of raised symbols disposed about its periphery in arcuate columns and an impactor assembly having ballistic elements cooperating with each row of symbols for columnar printing of selected symbols in rows on an endless web of multiple sheet ticket stock. The sheets are bound at selected intervals and are formed with sprocket holes disposed in spaced parallel relationship with the longitudinal axis of the ticket stock along the margins thereof, the sprocket holes of one sheet being in registration with corresponding sprocket holes of the adjacent sheet. A sprocket drive assembly engages the sprocket holes and incrementally advances the ticket stock into registration with the print drum and impactor assembly. As the ticket stock is advanced, the marginal areas thereof are engaged by a rotating cutter and the sprocketed margins are separated from the ticket body. Printing is accomplished by energizing selected ones of the ballistic elements and urging the multiple sheet ticket stock against the raised symbols in registration therewith, certain ones of the sheets being provided with a carbon backing. When all rows have been printed and the ticket stock is at a predetermined location, a solenoid actuated rotary cutter is energized and the printed ticket is sheared from the endless strip. Thereafter, the printed ticket is propelled from the ticket printer by means of an ejection mechanism.

The invention accordingly comprises the ticket stock and ticket printer possessing the construction, combination of elements, and arrangement of parts that are exemplified in the following detailed disclosure, the scope of which will be indicated in the appended claims.

BRIEF DESCRIPTION OF DRAWINGS

For a fuller understanding of the nature and objects of the present invention, references should be had to the following detailed description taken in connection with the accompanying drawings wherein:

FIG. 1 is a block and schematic diagram, partly in perspective of a ticket printer embodying the invention;

FIG. 2 is a top plan view of the ticket stock embodying the present invention;

FIG. 3 is a side elevation, somewhat exaggerated, of the ticket stock of FIG. 2;

FIG. 4 is a bottom plan view of the ticket stock of FIG. 2;

FIG. 5 is a plan view of an alternative form of the ticket stock embodying the invention;

FIG. 6 is an alternative embodiment of the ticket stock embodying the invention;

FIG. 7 is a perspective of the ticket printer embodying the invention;

FIG. 8 is a side elevation of the ticket printing mechanism of the ticket printer of FIG. 7; and

FIG. 9 is a perspective of the cutting mechanism of the ticket printer of FIG. 7.

DETAILED DESCRIPTION OF THE INVENTION

Referring now to the drawings, particularly FIG. 1, there is shown a system **10** for printing and dispensing multiple sheet tickets, for example airline tickets. In the illustrated embodiment, printing system **10** is interconnected with an online, real time computer communications system generally shown in block form at **11**. System **10** comprises a rotatable print cylinder **16**, for example a print drum, having rows of raised symbols disposed about its periphery in arcuate columns and an impactor assembly **17** including a plurality of ballistic elements **18** for printing selected symbols on an endless web of multiple sheet ticket stock **14** which stored in a hopper **19**. In the illustrated embodiment, by way of example, print drum **16** includes six rows of **47** characters each, adjacent rows of characters being in spaced parallel relationship to one another, and the number of ballistic elements **18** is six, one ballistic element **18** cooperating with one row of characters.

In one example of system operation, a printing cycle is initiated by enabling a control and encoder unit **22** which generates command signals. A print enable unit **20** generates a Busy/Ready signal in response to control and encoder **22** command signals. The Busy/Ready signal, which denotes a Ready state at this time, is applied to a computer (not shown) via an input/output terminal **12**. The computer generates data signals which represent the first row of characters to be printed on ticket stock **14**. These data signals are applied to a storage unit **24** via an input data terminal **26**. A Print Command generated by the computer is applied to control and encoder **22** via a delay **28** and the Busy/Ready signal changes to the Busy state. In response to a command signal generated by control and encoder **22**, the character data signals in storage **24** are applied to character comparator **30, 32, 34, 36, 38,** and **40**. A sensor **42** generates Code Line signals which denote the relative position of the characters on print drum **16** with respect to ballistic elements **18**. Sensor **42** is mounted in registration with an apertured encoder wheel **44** which is directly coupled to print drum **16** via a shaft **46**. Since encoder wheel **44** is directly coupled to print drum **16**, at any instant of time, Code Line signals generated by sensor **42** and derived from encoder wheel **44** correspond to the character on print drum **16** that is in registration with the correlative ballistic element **18**. The Code Line signals generated by sensor **42**, for ex-

ample an optical sensor which senses luminance emitted from a source **48**, are applied to comparators **30**, 32, 34, 36, 38 and **40** via control and encoder **22** and an amplifier **50**. When like signals generated by sensor **42** and storage **24** are presented at the input terminals of any one or all of character comparators **30, 32, 34,** 36, 38 and **40**, the correlative character comparator generates a signal which is applied to corresponding hammer controls **52, 54, 56, 58, 60** and **62**. Character comparators **30, 32, 34, 36, 38** and **40** are connected to hammer controls **52, 54 56, 58, 60** and **62**, respectively. One hammer control is connected to one ballistic element **18** which cooperates with only one row of characters on type drum **16**. That is, hammer control **52** is associated with the first row of characters, hammer control **54** is associated with the second row of characters hammer control **56** is associated with the third row of characters, and hammer control **58** is associated with the fourth row of characters, hammer control **60** is associated with the fifth row of characters and hammer control **62** is associated with the sixth row of characters. When a comparison occurs, the corresponding hammer control generates a signal which energizes ballistic element **18** associated therewith. The energized ballistic element **18** causes ticket stock **14** in registration therewith to be pressed against print drum **16**, whereby the appropriate character is printed on ticket stock **14**. The Code Line signals derived from encoder wheel **44** are gated with the Print Command in control and encoder **22** which generates Character Stroke signals to ensure that printing occurs only when the selected character is properly aligned and a Print Command is present, the Character Stobe signals being applied to hammer controls **52, 54, 56, 58, 60** and **62.**

When print drum **16** and encoder wheel **44** have completed one revolution, one column of characters will have been printed on ticket stock **14**. At this point, the Ready/Busy signal is in the Busy state and a Paper Feed pulse is generated by control and encoder **22**. The Paper Feed pulse is applied to a ticket driver mechanism **64** and ticket stock **14** is moved an equivalent distance of one row preparation for the printing of the next column of characters. After ticket stock **14** has been advanced, the Ready/Busy signal reverts to the Ready state. Data signals representing the next row of characters to be printed is applied to storage **24**. During the next revolution of print drum **16**, these characters are printed in columnar form on ticket stock **14**. The sequence continues until all columns have been printed.

When all columns have been printed, an End Ticket signal, generated by the computer is applied to control and encoder **22** via terminal **12**. The End Ticket signal energizes a slew ticket logic **66** in control and encoder **22** and the Ready/Busy line becomes Busy. As hereinafter described, ticket stock **14** is slewed into registration with a rotary cutter **68** which is controlled by a cutting mechanism **70**. This slewing action positions ticket stock **14** in proper orientation for printing of the first column of characters on the next ticket. In addition, the End Ticket signal energizes an eject assembly **72** which maintains tension on ticket stock **14** while it is being severed by cutter **68** and propels the ticket stock through a ticket slot (not shown) as soon as the cut is completed. A ticket stock sensor **89**, for example a microswitch, generates a command signal indicating that hopper **19** has been emptied. The details of ticket stock **14** are shown in FIGS. **2, 3,** and **4.**

Referring now to FIGS. **2, 3,** and **4,** it will be seen that ticket stock **14** comprises an endless web of individual ticket blanks **90**, for example multiple sheet airline passenger ticket blanks, composed of a fibrous material such as paper. In the preferred embodiment, ticket stock **14** is folded in a Z configuration along fold lines **92** and stored in hopper **19**. Each ticket blank **90** includes an upper stratum **94**, intermediate strata **96, 98,** 100, 102, 104 and **106**, and a bottom stratum **108**. As viewed in FIG. **2**, the upper and lower margins of each stratum **94, 96, 98, 100, 102, 104, 106** and **108** are formed with longitudinally extending perforations **110** which defined tear lines, perforations **110** on one stratum being in registration with perforations **110** in the adjacent stratum. Interposed between tear lines **110** and the upper and lower edges of each stratum **94, 96,** 98, 100, 102, 104, 106 and **108** is a series of spaced sprocket holes **112** which extend in space parallel relationship to the longitudinal axis of ticket stock **14**, sprocket holes **112** on one stratum being in registration with sprocket holes **112** on the adjacent stratum. In order to facilitate removal of each sheet of the printed ticket, each stratum **94, 96, 98, 100, 102, 104, 106** and **108** is provided with perforations **114** which extends between and in perpendicular relationship to tear lines **110**. The left margin of each stratum **94, 96, 98, 100,** 102, 104, 106 and **108** is bound as shown at the cross hatching denoted by reference character **116**. In the illustrated embodiment, a passenger ticket area **118** is defined as that area which is bounded by tear lines **110**, perforations **114** and fold line **92.**

As best shown in FIG. **4**, the left margin of each ticket **90** is bound by means of adhesive strips **120, 122.** The upper and lower edges of ticket **90** are bound by means of adhesive strips **124,** and **126,** respectively. In the illustrative embodiment, by way of example, adhesive strips **120, 122, 124** and **126** are provided on the underside of strata **94, 96, 98, 100, 102, 104, 106** and **108.** The underside of strata **94, 96, 98, 100, 102, 104,** and **106,** in registration with passenger ticket area **118** is provided with a carbon backing **128.** As hereinafter described, when ticket stock **14** is urged against print drum **16** by means of ballistic elements **18,** the appropriate character is printed on intermediate strata **96,** 98, 100, 102, 104, 106 and **108** as a result of the carbon backing on the adjacent sheet. That is, a character is imprinted on bottom stratum **108** as a result of the carbon backing on intermediate stratum **106,** a character is imprinted on intermediate stratum **106** due to the carbon back on intermediate stratum **104** and so on. It is to be noted that no characters are imprinted on upper stratum **94.** In the illustrated embodiment, strata **94, 96, 98, 100, 102, 104, 106** and **108** are paper sheets having like weights. In alternate embodiment upper and lower strata **94** and **96** define cover sheets having a weight which is heavier than intermediate strata **96,** 98, 100, 102, 104 and **106.** Alternate forms of ticket stock **14** are shown in FIGS. **5** and **6.**

Referring now to FIG. **5** there is shown a ticket stock **120** which includes a passenger ticket area **122** and an endorsement area **124.** Ticket stock **120** is provided with longitudinally extending perforations **126** along the upper and lower margins as viewed in FIG. **5.** A series of space sprocket holes **128** are interposed between perforations **126** and the upper and lower edges

of ticket stock **120**, sprocket holes **128** being in spaced parallel relationship with the longitudinal axis of ticket stock **120**. The left margin of ticket area **122** is bound at the cross hatching denoted by reference character **132** and endorsement area **124** is bound at the cross hatching denoted by reference character **134**. Removal of printed passenger tickets is facilitated by means of perforations **136** and **138** which extend in perpendicular space relationship to perforations **126**, passenger ticket area **122** being bounded by perforations **126**, 136 and **138**. Perforations **140** which extend in perpendicular spaced relationship to perforations **126** are provided for facilitating removal of printed endorsement information, endorsement area **124** being bound by perforations **126**, **140** and fold line **130**. It is to be understood that, in the illustrated embodiment, ticket stock **120** is a multiple sheet ticket blank which is similar in construction to ticket **90**.

Referring now to FIG. **6**, there is shown an alternate embodiment of ticket **90** in the form of a ticket stock **142**. As viewed in FIG. **6**, the upper and lower margins of ticket stock **142** are provided with a series of spaced sprocket holes **144** which are disposed in spaced parallel relationship with longitudinal axis of ticket stock **142**. It is to be noted that sprocket holes **144** are within a passenger ticket area denoted by reference character **146**. Ticket stock **142** is folded in a Z configuration along the fold line denoted by reference character **148**. The left hand side of ticket stock **142** is bound as shown in the cross hatching denoted by reference character **150**. In order to facilitate removal of a printed passenger ticket, there is provided perforations **152** which extend in spaced perpendicular relationship to the longitudinal axis of ticket line **142**. It is to be noted that ticket blank **90** and ticket blank **142** are similar with the exception that the sprocket holes provided ticket stock **142** are internal to the passenger area while the sprocket holes provided in ticket blank **90** are external to the passenger area. In the following discussion of the details of ticket printer **10**, by way of example, it is assumed that the ticket blanks stored in hopper **19** are of the type denoted by reference character **90**.

Referring now to FIG. **7**, it will be seen that ticket printer **10** is organized about a housing **160** having a pivoted frame portion **162**. Ticket stock blank **90** is threaded about a guide **164** and is engaged by drive mechanism **64**, guide **164** being mounted to housing **160**. It will be noted that drive mechanisms **64** engages oppose sides of ticket **90**. For clarity, only one side of drive mechanism **64** is shown. It is to be understood that the hidden side of drive mechanism **64** is structurally and functionally similar to the side of drive mechanism **64** which is shown in FIG. **7**. Drive mechanism **64** includes a double ended motor **166** having a pulley **168** which is drivingly connected to a pulley **170** via a belt **172**. Pulley **170** is coupled to a sprocket drive pulley **174** by means of a shaft **176**. A sprocketed belt **178** is operatively connected between a sprocketed pulley **180** and sprocketed pulley **174**. Sprocketed belt **178** is adapted to engage sprocket holes **112** of ticket stock blank **90**. A rotating cutting blade **182** is coupled to sprocketed pulley **180** in registration with tear lines **110**. As cutter blade **182** engages ticket stock **90**, sprocket holes **112** are separated from the ticket body along perforations **110**. Ticket stock **90** is threaded into ticket printer **10** by lifting frame **162** which is pivoted about a pin **184**. When frame **162** is in the closed position as shown in FIG. **7**, print drum **16** is in registration with ballistic elements **18**. Print drum **16** is rotatably mounted to frame **162** by means of shafts **186** and **188**. A pulley **190**, which is mounted to shaft **186**, is connected to a pulley **192** via a belt **194**. On a common shaft **195** with pulley **192** is a pulley **196** which is connected to a pulley **198** via a belt **200**. Pulley **198** is coupled to a motor **202**. Also connected to pulley **198** on a common motor shaft **199** is a belt **204** which is connected to a pulley **206**. A nip roller **208** is driven by pulley **206**, ticket stock blank **90** being threaded between nip roller **208** and a nip roller **210**. It is to be understood that nip rollers **208**, **210** operate to maintain tension on ticket stock blank **90** during the printing cycle and operate to propel the printed ticket from printer **10** after the cutting operation.

Referring now to FIG. **8**, it will be seen that impactor assembly **17** includes an actuator **211** which is in registration with an impactor arm **212** having an impactor **213**. Ballistic hammer **18** comprises a housing **214** and a hammer **215**. Housing **214** is formed with a guideway **216** which is adapted to slidably receive hammer **215**. A bias element **217**, for example a compression spring, is spiraled about hammer **215** within guideway **216**. A retaining ring **218** is mounted to hammer **215** for holding spring **217** in such a manner that hammer **215** is biased downwardly within guideway **216**. When actuator **211**, for example an electromagnetic actuator, is energized by the command signal generated by sensor **42**, impactor arm **212**, which is pivoted about a pin **219**, is pulled toward actuator **211**. In consequence, impactor **213** contacts hammer **215** which is driven towards print drum **16**. Thereafter, impactor arm **212** decouples from hammer **215** and returns to a rest position. Hammer **215** continues its upward flight and strikes the underside of ticket stock blank **90**, momentarily forcing ticket stock blank **90** against a raised character on print drum **16**. Hammer **215**, aided by compressed spring **217**, returns to the rest position. Upon completion of the printing cycle, the completed, ticket is separated by means of cutting mechanism **70**.

Refeering now to FIG. **9** there is shown the details of cutting mechanism **70**. A cam plate **220** having an eccentric cam track **222** is mounted to shaft **186**. A crank arm **224** having a cam follower **226** is mounted to a shaft **227** which is fixed to cutter **68**. An extending arm **228** of an actuator **230** is mounted to crank arm **224** by means of a pin **232**. When actuator **230** is energized, cam follower **226** is engaged by cam track **222** and cutter **68** is rotated. As best shown in FIG. **1**, cutter **68** is formed with a concave cutting edge **234** which engages ticket stock blank **90** when cutter **68** is engaged by cam track **222**. A cutter block **236** is mounted in registration with cutting edge **234**, ticket stock blank **90** being threaded between cutter **68** and block **236**. In consequence, when cutter **68** is rotated, ticket stock blank **90** is severed by the scissor-like action of cutting edge **234** and cutting block **236**.

Since certain changes may be made in the foregoing disclosure without departing from the scope herein involved, it is intended that all matter be construed in an illustrated and not in a limiting sense.

What is claimed is:

1. A high speed rotary printer for printing selected symbols on an endless web of multiple sheet stock formed with sprocket holes disposed in spaced parallel

relationship with the longitudinal axis thereof, said printer comprising:

a. a rotatable printing cylinder having rows of raised characters disposed about its periphery in arcuate columns;

b. an impactor assembly including a plurality of actuators, impactors and hammers, one of each said actuator associated with one of each said impactors, one of each said impactors associated with one of each said hammers, one of each said hammer associated with one of each said rows of raised characters, each said actuator having energized and deenergized states, each said impactor operative between a rest position and an actuated position, each said hammer restrained for reciprocal movement between a rest position and a strike position, said impactor moved from its rest position to its actuated position when said actuator associated therewith is momentarily in its energized state, said moved impactor momentarily engaging said hammer associated therewith, said engaged hammer moving from its rest position to its strike position and decoupling from said moved impactor, said moved impactor returning to its rest position, said engaged hammer striking the multiple sheet stock and momentarily forcing the multiple sheet stock against one of said raised symbols in said row in registration with said engaged hammer, said hammer returning to its rest position, said raised symbol pressed against the multiple sheet stock being printed on each of the multiple sheets;

c. first sprocket drive means;

d. second sprocket drive means;

e. a belt engaging said first and second sprocket drive means, said belt including sprocket pins adapted for engagement with the sprocket holes in the multiple sheet stock, the multiple sheet stock forwardly advancing in a path from said first sprocket drive means to said second sprocket drive means when engaged by said belt;

f. a rotating cutting blade operatively connected to said second sprocket drive means, said rotating cutting blade operative to sever the sprocket holes from the multiple sheet stock;

g. rotary cutter means positioned in said path after said second sprocket drive means, said rotatable printing cylinder disposed in said path between said first sprocket drive means and said rotary cutter means, said rotary cutter means disposed in perpendicular relationship to the longitudinal axis of the multiple sheet stock and operative to sever the multiple sheet stock after said symbols are printed thereon; and

h. tension means engaging opposite faces of the multiple sheet stock, said tension means disposed in said path after said rotary cutter means, said tension means providing tension on the multiple sheet stock and ejecting the printed multiple sheet stock from the printer when severed by said rotary cutter means.

2. The high speed rotary printer as claimed in claim 1 wherein said rotary cutter means includes:

a. cylindrical cutter means formed with an opening having a substantially concave cutting edge adapted to engage the multiple sheet stock;

b. a cam plate having an eccentric cam track operatively connected to said cylindrical cutter means;

c. means for rotating said cam plate;

d. a crank arm having a cam follower adapted for engagement and disengagement with said cam track; and

e. means for moving said crank arm towards said cam plate, said cam follower engaging said cam track when said crank arm is moved towards said cam plate, said cylinderical cutter means being rotated when said cam follower engages said cam track, the multiple sheet stock being severed when engaged by said concave cutting edge.

3. A high speed rotary printer for printing selected symbols on an endless web of multiple sheet stock formed with sprocket holes disposed in spaced parallel relationship with the longitudinal axis thereof, said printer comprising:

a. a housing;

b. a frame pivotably mounted to said housing;

c. a rotatable printing cylinder mounted to said frame, said printing cylinder having rows of raised characters disposed about its periphery in arcuate columns;

d. an impactor assembly mounted to saidhousing, said impactor assembly including a plurality of actuators, impactors and hammers, one of each said actuators associated with one of each said impactors, one of each said impactors associated with one of each said hammers, one of each said hammer associated with one of each said rows of raised characters, each said actuator having energized and deenergized states, each said impactor operative between a rest position and an actuated position, each said hammer restrained for reciprocal movement between a rest position and a strike position, said impactor moved from its rest position to its actuated position when said actuator associated therewith is momentarily in its energized state, said moved impactor momentarily engaging said hammer associated therewith, said engaged hammer moving from its rest position to its strike position and decoupling from said moved impactor, said moved impactor returning to its rest position, said engaged hammer striking the multiple sheet stock and momentarily forcing the multiple sheet stock against one of said raised symbols in said row in registration with said engaged hammer, said hammer returning to its rest position, said raised symbol pressed against the multiple sheet stock being printed on each of the multiple sheets;

e. first sprocket drive means mounted to said housing;

f. second sprocket drive means mounted to said housing;

g. a belt engaging said first and second sprocket drive means, said belt including sprocket pins adapted for engagement with the sprocket holes in the multiple sheet stock, the multiple sheet stock forwardly advancing in a path from said first sprocket drive means to said second sprocket drive means when engaged by said belt;

h. a rotating cutting blade operatively connected to said second sprocket drive means, said rotating cutting blade operative to sever the sprocket holes from the multiple sheet stock;

i. rotary cutter means mounted to said housing in said path after said second sprocket drive means, said rotatable printing cylinder disposed in said path be-

tween said first sprocket drive means and said rotary cutter means, said rotary cutter means including a cylindrical cutter formed with an opening having a substantially concave cutting edge adapted to engage the multiple sheet stock, a cam plate having an eccentric cam track operatively connected to said cylindrical cutter, means for rotating said cam plate, a crank arm having a cam follower adapted for engagement and disengagement with said cam track, and means for moving said crank arm towards said cam plate, said cam follower engaging said cam track when said crank arm is moved towards said cam plate, said cylindrical cutter being rotated when said cam follower engages said cam track, the multiple sheet stock being severed when engaged by said concave cutting edge; and

j. tension means mounted to said housing in said path after said rotary cutter means, said tension means including first and second rollers disposed at and engaging opposite faces of the multiple sheet stock, said tension means providing tension on the multiple sheet stock and ejecting the printed multiple sheet stock severed by said rotary cutter means from the printer.

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