

- [54] **WEB OF RECORD MEMBERS**
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- [22] Filed: **Apr. 9, 1973**
- [21] Appl. No.: **349,131**

Related U.S. Application Data

- [62] Division of Ser. No. 92,468, Nov. 24, 1970, Pat. No. 3,783,783.
- [52] U.S. Cl. **235/61.12 R**, 40/21 C, 101/26
- [51] Int. Cl. **G09f 3/14**, G06k 19/02, B44b 5/00
- [58] Field of Search 101/3, 4, 5, 6, 7, DIG. 9, 101/24, 26; 235/61.12 R, 61.12 N; 40/21, 21 C; 234/71

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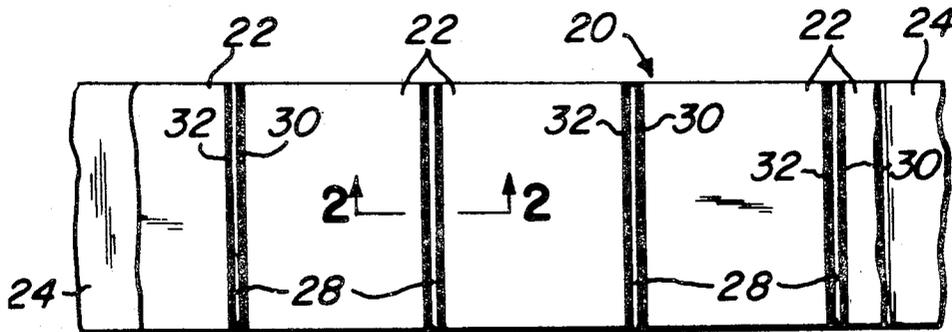
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Assistant Examiner—Robert M. Kilgore
Attorney, Agent, or Firm—Joseph J. Grass

ABSTRACT

There are disclosed record members in the form of a

web of pressure sensitive labels and a web of tickets formed by transverse cuts in the web, with each member having a mark printed on one marginal edge, the mark preferably being printed using invisible ink. A method of making the record members includes the step of inking a cutter and operating the cutter to simultaneously cut the web to provide a plurality of record members and printing along at least one marginal edge of each member. Another record member has an aligner formed in it and a printed mark forming an outline around the aligner, the aligner having a predetermined relationship with respect to a code printed on the record member. A method of making the record member comprises providing code forming members and aligner forming members, inking the aligner forming member, applying the code to the record member and substantially simultaneously forming an aligner in the record member and printing a mark immediately adjacent the aligner. There is also disclosed a web of record members composed either of pressure sensitive ticket, or label stock material in which there are marks disposed at equally spaced apart intervals along its length. The marks are used to control intermittent feeding of the web of record members so that recording can be at any desired location on the record members and the record members can be cut to the desired length without shifting the cutter or the recorder means relative to each other. There is also disclosed apparatus for practicing these methods.

1 Claim, 15 Drawing Figures



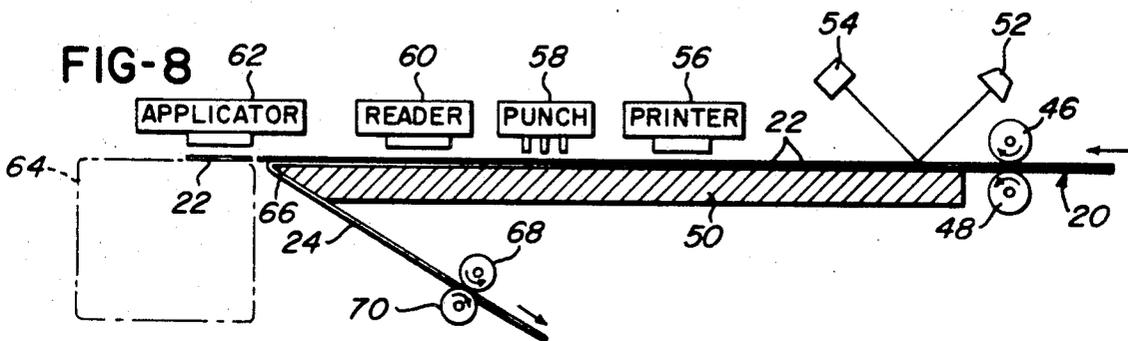
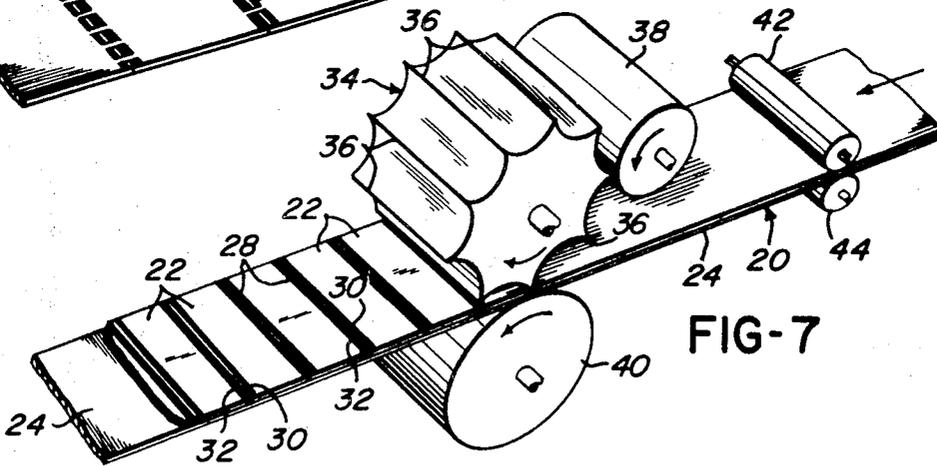
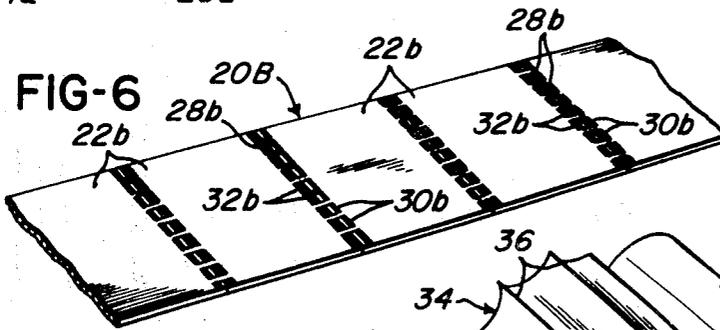
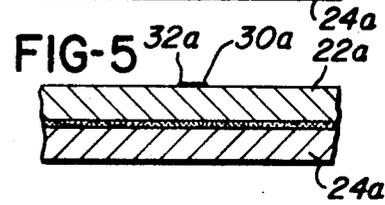
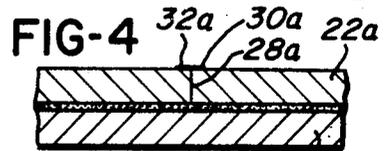
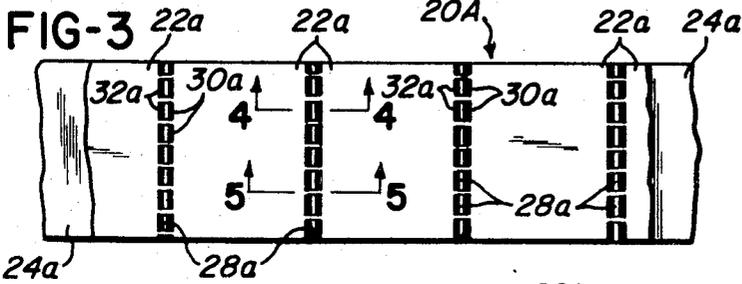
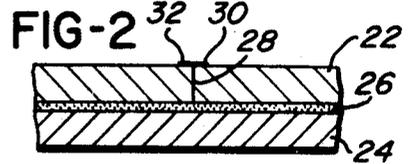
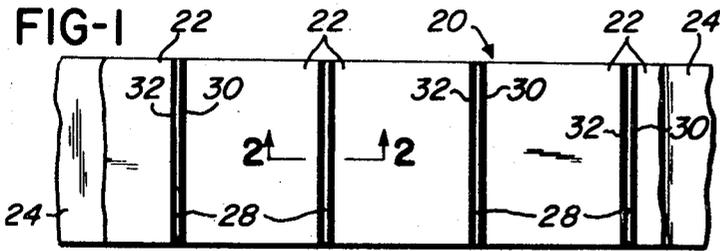


FIG-9

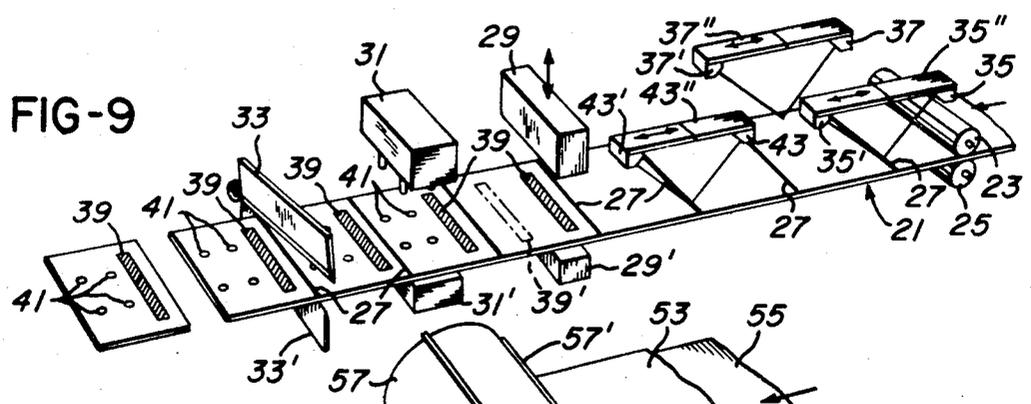


FIG-10

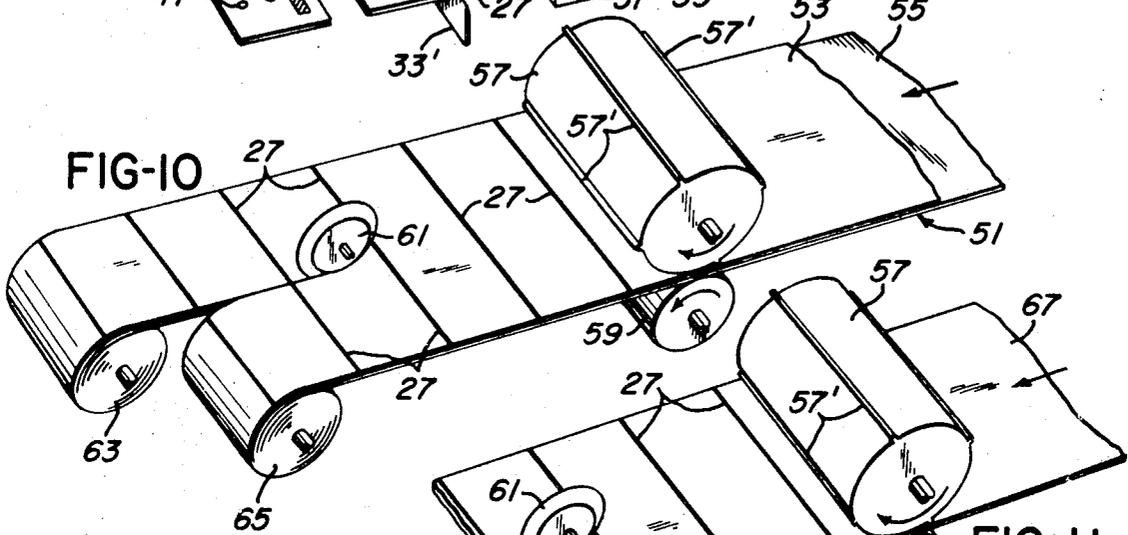


FIG-11

FIG-12

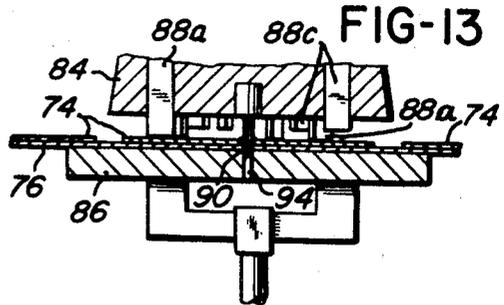
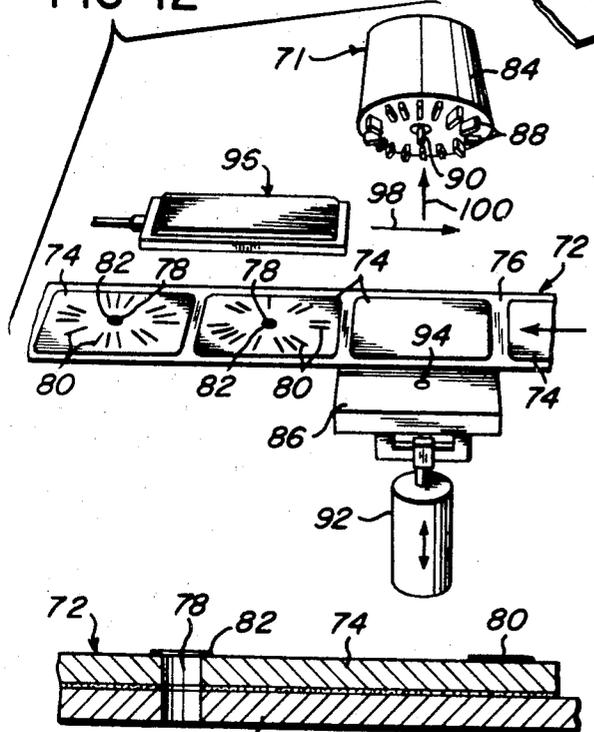


FIG-13

FIG-14

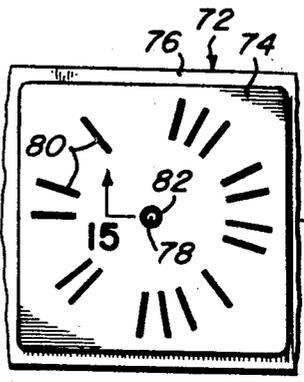
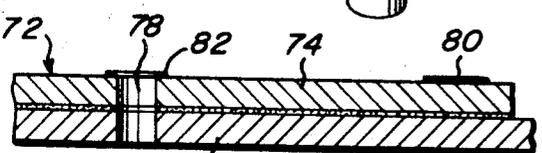


FIG-15



WEB OF RECORD MEMBERS

CROSS-REFERENCE TO RELATED APPLICATIONS

This is a division of application Ser. No. 92,468, filed Nov. 24, 1970, now U.S. Pat. No. 3,783,783. Reference is also made to another divisional application entitled "METHOD OF MAKING AND USING RECORD MEMBERS" filed on the same date as the present application.

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates to the art of making tickets, tags and labels, and methods and apparatus for making same.

2. Brief Description of the Prior Art

It is known in the art to provide gaps between adjacent pressure sensitive labels and to provide holes between adjacent tickets in a web. These gaps and holes make it relatively easy to sense the leading edge of the label or ticket for purposes of registry associated with printing and/or applying functions. With respect to pressure sensitive labels these gaps require that the matrix between the labels must be stripped away; accordingly for a particular size label there is some waste of both label and backing materials. With respect to tickets, chad is produced when the tickets are made; in addition, when the resultant holes between adjacent tickets are used for feeding the tickets sizing and location of these holes must be accurate to obviate malfunctioning of the apparatus with which they are used. Pressure sensitive type labels have been made by either completely cutting or partially cutting through the label material to the backing material. Tickets and gummed labels are formed by partially cutting through the stock material. Such partial cutting and complete cutting of the web material is known as "butt cutting" because the labels or tickets, as the case may be, abut each other. The resultant butt cuts or slits are, however, difficult to sense for registration purposes as is usually required by commercially successful printing, punching, reading and/or label applying machines.

SUMMARY OF THE INVENTION

Making record members such as labels and tickets by at least partially cutting a web of stock material at equally spaced apart intervals along transverse lines and printing on the web at a marginal edge of each record member to provide machine-readable marks. Printing can be performed substantially simultaneously with the cutting by inking the cutter. It is preferred to use invisible ink in which event the sensing device must be capable of reading the presence or absence of such ink. Another method of the invention includes providing a record member, arranging code forming means and aligner forming means adjacent the record member, inking the aligner forming means, moving the aligner forming means and the record member relatively into contact with each other for forming an aligner in the record member and printing on the edge of the aligner, and coding the record member by moving the code forming means and the record member relatively into contact with each other, thereby making the aligner more easily recognizable by both humans and machine readers. Invention also resides in the re-

cord members per se whether made by the above described or other methods. Not only is a low cost label or ticket provided, but the resultant label or ticket is capable of being registered for purposes of performing other functions on or with respect to it, such as printing and applying. Another web of record members having transverse lines of printed marks extending across it is very economical to manufacture. If this web is intermittently driven to a recording zone and a cutting zone, controlled starting and stopping of the web in response to the printed marks will enable the recording to be performed at the desired location on the record member and the endmost record member can be cut off without shifting the recorder means or the cutter means relative to each other. Yet novel apparatus for carrying out the above described methods can be relatively simple.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a top plan view of a web of pressure sensitive labels embodying the invention wherein the label material is shown completely cut by means of butt cuts; FIG. 2 is a sectional view taken along line 2—2 of FIG. 1;

FIG. 3 is a top plan view of a web of pressure sensitive labels, wherein the label material is shown partially cut;

FIG. 4 is a sectional view taken along line 4—4 of FIG. 3;

FIG. 5 is a sectional view taken along line 5—5 of FIG. 3;

FIG. 6 is a perspective view of a web of tickets;

FIG. 7 is a diagrammatic perspective view of a cutting and printing member, an inker and a platen roll with record stock material being fed between the cutting and printing member and the platen roll;

FIG. 8 is a side elevational view showing how the record members of the invention can be used;

FIG. 9 is a perspective diagrammatic view showing the method by which labels of various lengths can be made without varying the distance between members which operate on the record members.

FIG. 10 is a diagrammatic view illustrating the method by which pressure sensitive label material useable in the arrangement of FIG. 9 can be made;

FIG. 11 is a perspective view showing the manner in which ticket or gummed label material, useable in the arrangement of FIG. 9, can be made;

FIG. 12 is an exploded perspective view of apparatus for substantially simultaneously forming an aligner in a record member and printing a mark at the edge of the aligner, and applying a code to the record member;

FIG. 13 is a fragmentary sectional view showing the apparatus of FIG. 12 in the printing and aligner forming position;

FIG. 14 is a top plan view of a fragmentary portion of the web of record members shown in FIG. 12, on an enlarged scale; and

FIG. 15 is a sectional view taken along line 15—15 of FIG. 14.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

With reference to FIGS. 1 and 2 of the drawings there is shown a strip or web generally indicated at 20 of record members 22. The record members 22, in the form of pressure sensitive labels, are disposed on back-

ing material 24 in the form of a strip or web. A pressure sensitive adhesive 26 on the underside of the record members 22 adheres the record members 22 to the backing material 24 but the record members 22 are readily individually removed or released from the backing for application to merchandise because of a coating applied to the backing material 24 as is conventional.

The record members 22 are formed by making transverse equally spaced-apart cuts 28 across the label material down to the backing material 24 as illustrated in FIGS. 1 and 2. This type of label making is referred to as "butt cutting." Both the leading and trailing marginal edges adjacent the cuts 28 have printed marks 30 and 32 respectively. The printing is preferably done with invisible ink. By "invisible" is intended an ink which is not within a range visible to the human eye but it is within the range of known and commercially available optical readers. It is convenient according to the invention to print marks 30 and 32 at the respective leading and trailing edges of each record member 22. However, a printed mark can be applied at only the leading edge or at only the trailing edge of each record member, if desired.

With respect to the embodiment of FIGS. 3-5, there is shown a strip or web generally indicated at 20A having record members 22a, in the form of labels, disposed on backing material 24a. In all respects, the web of record members 20A is the same as the web 20, except that instead of completely cutting through the label material which comprises the record members 22a, as in the embodiment of FIGS. 1 and 2, the record members 22a are still partially connected to each other at lines of partial cutting or severing indicated at 28a. Printed marks 30a and 32a are disposed at the marginal leading and trailing edges of each record member 22a, and the printing is preferably accomplished using invisible ink as disclosed with respect to the embodiment of FIGS. 1 and 2. If desired, a printed mark can be applied only to the leading edge or only at the trailing edge of each record member 22a.

With respect to the embodiment of FIG. 6 the invention is applied to a strip or web generally indicated at 20B of record member 22b in the form of either tickets or gummed labels. The web is consequently comprised of either ticket stock or gummed label material and the record members 22b are formed by partially cutting or partially severing along equally spaced-apart transverse partial cuts 28b. The partial severing at lines 28b is such that one record member 22b can be readily separated as by tearing at the partial cut 28b, and yet until such tearing is accomplished the record members 22 will remain connected to each other. Marks 30b and 32b are printed at the respective leading and trailing edges of each record member, preferably using invisible ink as described in the embodiment of FIGS. 1 and 2. If desired, a printed mark can be applied only to the leading edge or only to the trailing edge of each record member 22b.

Referring to FIG. 7, there is shown a rotary cutter 34 disposed on one side of the web 20 having a plurality of equally radially spaced apart knives of knife edges 36. The knife edges 36 form the transverse cuts in what is illustrated to be the web 20 of the embodiment of FIGS. 1 and 2. A rotatable ink roll 38 is shown to be in inking cooperation with the knife edges 36 of the cutter 34 so that as the cutter 34 rotates ink will be applied to the knife edges 36. A platen roll 40 is shown

to be disposed on the other side of the web 20 in cooperation with the cutter 34. The cutter 34 and the platen roll 40 are spaced apart a sufficient distance to cause cuts 28 to be made entirely through the label material down to the backing material 24. The web 20 passes between feed rollers 42 and 44 which serve to continuously feed the web 20 between the bite of the cutter 34 and the platen roll 40. As the cuts 28 are being made the ink which was applied by the rotary inker 38 is transferred to the label material at both marginal edges adjacent the cuts 28. The web 20A and the web 20B are formed into respective record members 22a and 22b by using the same arrangement as disclosed in FIG. 7. However, the cutting knives or knife edges 36 are conventionally contoured so as to provide the respective lines of partial cutting 28a and 28b.

Although the invention is illustrated with respect to a rotary cutter 34 and a platen roll 40, the invention is capable of being carried out using cutter knives or cutters which are disposed in a flat bed arrangement (not shown) in cooperation with a flat platen (not shown) in which an inker is provided for inking the knives prior to cutting and printing.

FIG. 8 illustrates diagrammatically various functions which can be performed using any of the webs 20, 20A and 20B of the invention. Feed rolls 46 and 48 are illustrated as feeding the web 20 across the upper surface of a support member 50. A light source 52 illuminates the web 20 and a photodetector 52 senses the marks, in particular the marks 30 and 32 on the web 20. By detecting these marks, or one of these marks, various utilization devices which require registry of the web 20 can be activated. Illustrated utilization devices are a printer 56, a punch 58, a record reader 60, and an applicator 62. Registration of the web 20 with respect to each and every one of these utilization devices can be very simply effected by using the marks 30 and 32, or one of them if only one is provided per record number, to control timing and registration. These marks provide a start signal for the reader which is used to verify information applied to the web 20 by the printer 56 and the punch 58. Also, the applicator 62 can be actuated at the proper time in the cycle so that the endmost record member 22 can be applied to merchandise generally indicated by phantom lines 64. As the web 20 is advanced by the feed rolls 46 and 48, the record members 22, in this instance labels, are stripped from the backing strip or web 24 which passes around a sharp bend provided by a terminal end 66 of the support member 50. Tension can be applied to the backing strip 24 by driven rolls 68 and 70.

With reference to FIG. 9, there is a web generally indicated at 21 which can be either a composite web of pressure sensitive material releasably adhered to backing material or it can be ticket or gummed label stock material. The web 21 of record members passes between feed rollers 23 and 25 which are operable to intermittently feed the web 21. Printed on the web along transverse lines at equally spaced-apart intervals are marks 27 which extend all the way across the web. These marks are preferably printed using invisible ink. Disposed adjacent the web is one form of recorder namely a print head 29 and a cooperating platen 29', another form of recorder namely a punch 31 and a cooperating die 31', a pivotally mounted knife 33 cooperating with a stationary knife element 33', a light source 35 and an associated photosensor 35' mounted on a

support 35'' which is adjustable lengthwise relative to the direction of movement of the web, and a light source 37 and an optical photosensor 37' mounted on a support 37'' which is adjustable relative to the direction of movement of the web. By using photosensor controlled means, the printed area 29, printed by cooperation of the print head 29 and the platen 29', the code 41 formed by cooperation of the punch 31 and the die 31' can be precisely located on each record member with respect to each other and with respect to the leading edge and trailing edge of the record member, without shifting either the print head 29 and its platen 29', or the punch 31 and its respective die 31', or the knife 33 and its respective knife element 33'.

Assume first that it is desired to print on the web at areas 39, that the area 39 is a predetermined distance from the trailing edge of the record member, and that the punch 31 and the die 31' are not being used. This would normally require adjustment of either the knife 33 or the printing head 29 in longitudinal direction in the event it is desired to feed the web continuously. In addition, further adjustment would be required for each different label size. However, by operating the knife from the photocell 37' and by operating the print head by the photocell 35' and intermittently driving or feeding the web 21, it is possible to orient the position of the printed area 39 a desired distance from the leading or trailing edge of the record member.

Assume next that it is desired to print tickets which are longer than the ones shown in FIG. 9 but that the printed area is to be the same distance from the trailing edge of the record member as the printed area 39 is from the printed edge of the associated record member. It would only be necessary to adjust the position of the support 37'' and the light source 37 and the photosensor 37' which it mounts in a lengthwise direction with respect to the web as shown in FIG. 9. Thus, while the print head 29 prints at the desired location in response to the photosensors 35' sensing a printed mark 27, the photosensor 37' senses one of the marks 27 to control the operation of the knife. To accomplish this the web 21 is driven intermittently by means of the feed rolls 23 and 25. In this example, forward movement of the web is interrupted when the photocell 35' senses a mark 27 and following printing the feed rolls 23 and 25 again commence feeding the web 21 until the photosensor 37' senses an associated mark at 27 at which time the feed of the web 21 is interrupted and the knife 33 can cut the web at the desired location. In the event it is desired to locate the printed area other than as indicated at 39, it is only necessary to adjust the portion of the support 35'' on which the light source 35 and the photosensor 35' are mounted.

The punch 31 and die 31' are under the control of a line source 43 and photosensor 43' mounted to a support 43'' which is adjustable relative in a longitudinal direction with respect to movement of the web 21. Accordingly, the location of the punched holes on the record members can be readily adjusted. When the photosensor 43' senses a mark 27 on the web 21, the feed of the web 21 is interrupted and the punch 31 and die 31' punch the holes 41 at the desired location with respect to the mark 27. After the punching operation is completed, the rolls 23 and 25 again feed the web. Referring to FIG. 10, there is shown a web 51 of stock material including a web of pressure sensitive material 53 adhered to a web of backing material 55. The web is

fed between a print roll 57 and a platen roll 59. The print roll 57 has printing elements 57' which extend transversely with respect to the direction of feed of the web 51. The print roll 57 and the platen roll 59 rotate continuously to print the marks 27 on the web 51 at equally spaced apart intervals. A rotary slitter knife 61 is used to slit the web into a plurality of webs which are thereafter wound into rolls 63 and 65. The stock material in web form is useable in the arrangement shown in FIG. 9. FIG. 11 is similar to FIG. 10 except that web 67 is composed of either ticket stock or gummed label material, rather than pressure sensitive material mounted on backing material as illustrated in FIG. 10. In the embodiments of FIGS. 10 and 11, printing is preferably accomplished using invisible ink.

With reference to FIGS. 12-15, there is disclosed a web 72 composed of record members 74, in particular pressure sensitive labels releasably or removably adhered by pressure sensitive adhesive to a web or strip 76 of backing material. FIG. 12 is an exploded view showing the relationship of apparatus 71 for forming an aligner 78 in each of the record members 74, for applying a code of the type disclosed in U.S. patent to Hamisch et al, U.S. Pat. No. 3,418,456 illustrated as taking the form of a plurality of marks 80 position on the record members 74 in predetermined relationship with respect to the aligner 78, and for printing a mark 82 adjacent each aligner 78. The apparatus 71 includes a code head 84 and a flat platen 86. The code head 84 is shown to include a plurality of code printing members 88 in a predetermined relationship with respect to an aligner forming member specifically a punch 90. The code printed on the record member 74 is determined by the positions of the printing members 88. For example, in FIG. 13, printing members depicted as 88a are shown in the printing position whereas printing members depicted as 88c are shown in the non-printing position, with respect to the movable platen 86. Accordingly only printing members 88a will be effective to print marks on the record member 74 which is brought into printing cooperation with these printing members by movement of the platen 86. The platen 86 is capable of being moved relatively toward or away from the code head 84, to form the aligner 78 and to effect printing of the code, by any suitable means such as a piston-cylinder mechanism 92. The platen 86 is provided with an aperture 94 into which the punch 90 can extend when the platen 86 is in the position shown in FIG. 13.

An inking member 96 is shown to be of the flat type. However, it can as well be an ink roll which is moved across and in contact with, printing members 99 and the punch 90. The flat type of ink pad as illustrated at 96 can move from the position shown in FIG. 12 to a position between the web 72 and the code head 84 in the direction indicated by arrow 98 and thereafter the inker 96 can be moved against the printing members 88 and the punch 90 in the direction indicated by arrow 100.

In carrying out the method of the invention, the code forming members 88 and the aligning forming member 90 which are arranged adjacent a record member 74 are inked by an inker as diagrammatically illustrated at 96. Thereafter the record member 74 is moved toward and into contact with the code and aligner forming members 88 and 90 by the platen 86. The code forming member 90 contacts the record 74 first and as it forms

the aligner in the record 74 the ink which was applied to its terminal end is applied to the record member 74 in the form of a mark at the marginal edge of the aligner 78. In particular, the mark provides a visible outline about the edge of the aligner 78 thereby making the aligner more readily visible. In the illustrated embodiment, the aligner 78 is a hole in the record member 74. However, the aligner can be a chadless hole, it can be a dimple or depression in the record member 74, or some other deformation of the surface of the record member 74. In any event, appropriate aligner forming member applies to the record member 74, the ink applied to it by the inker 96. When the platen 86 is in the position shown in FIG. 13 its printing members such as 88a, which are in the printed position with respect to the platen 86 will form a machine readable code on the surface of the record member. The code could be formed by punches instead of printing members 88 if it is desired to substitute a punched code for a printed

code.

Other embodiments and modifications of this invention will suggest themselves to those skilled in the art, and all such of these as come within the spirit of this invention are included within its scope as best defined by the appended claims.

I claim:

1. A web of record members, comprising: a web of supporting material, label material, pressure-sensitive adhesive releasably adhering the label material to the supporting material web, transverse butt cuts through the label material across the entire width of the label material to separate the web into a plurality of labels, and a printed mark extending along the entire length of at least one edge of each label at the butt cut, the mark being formed by invisible ink which is capable of being sensed by reading apparatus.

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