Sept. 4, 1973 G. W. VON HOFE ET AL 3,756,899
SYSTEM OF LABEL VERIFICATION CONTROL AND PRODUCT ACCOUNTABILITY
Original Filed Feb. 12, 1968 2 Sheets-Sheet 1

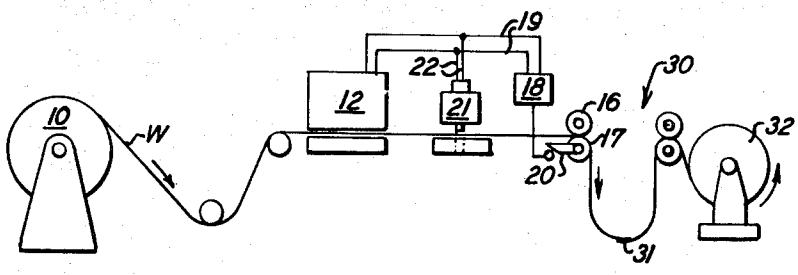


FIG. 1

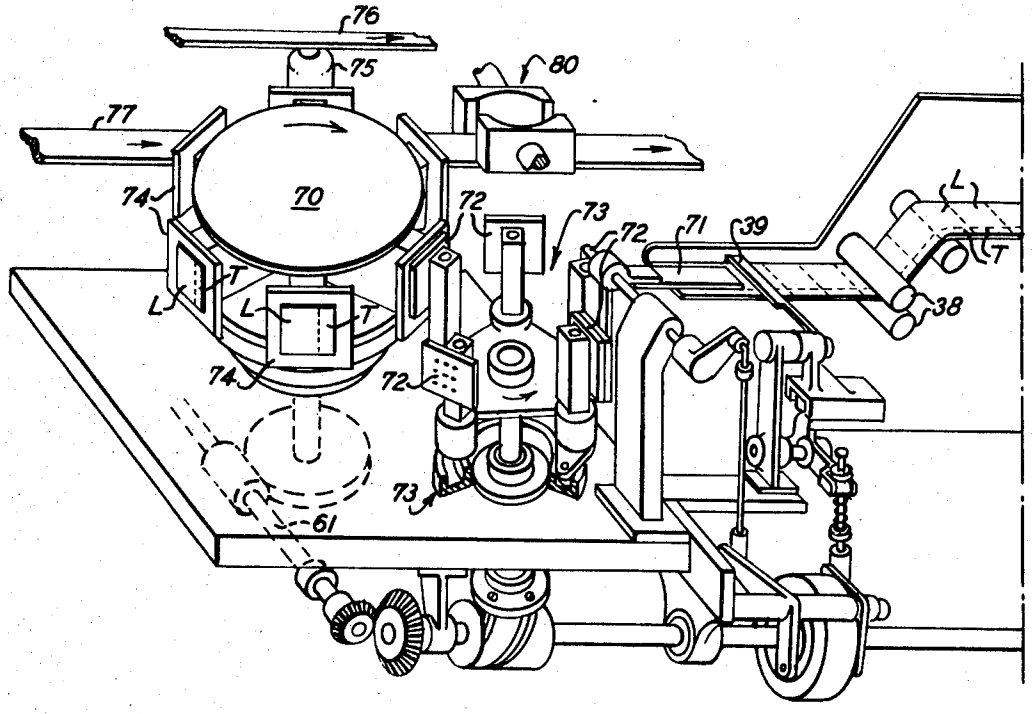


FIG. 2A

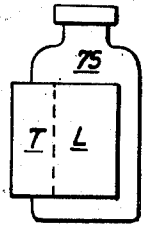


FIG. 6

INVENTOR
GEORGE W. VON HOFE
EDWIN K. WOLFF

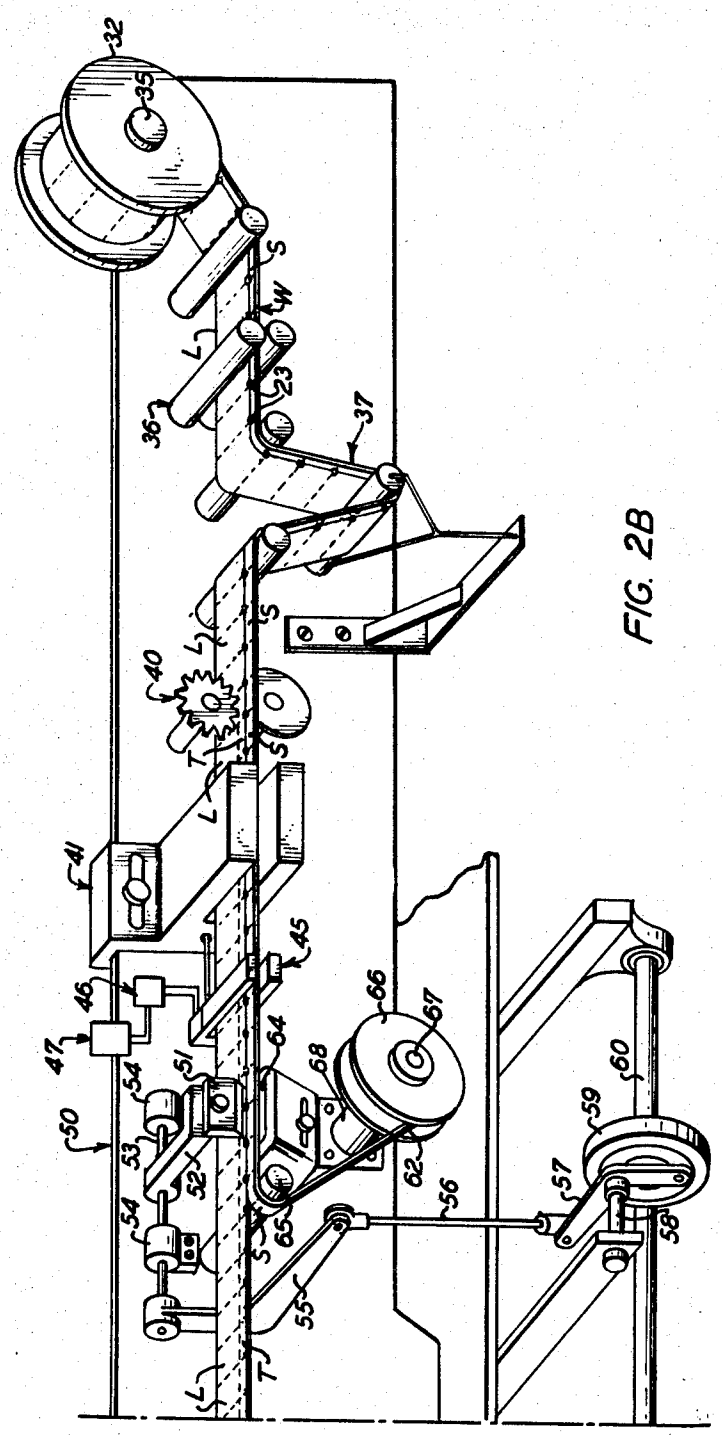


FIG. 2B

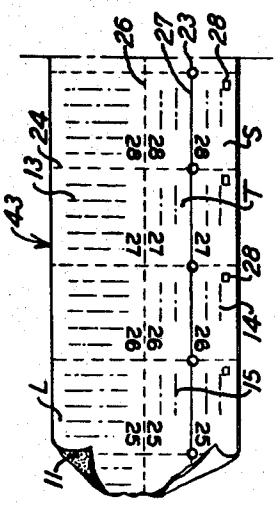


FIG. 5

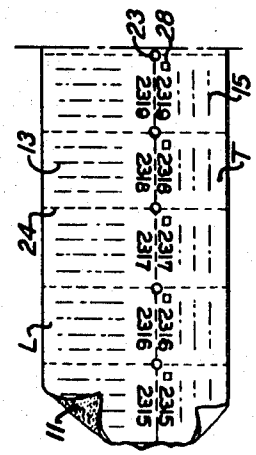


FIG. 4

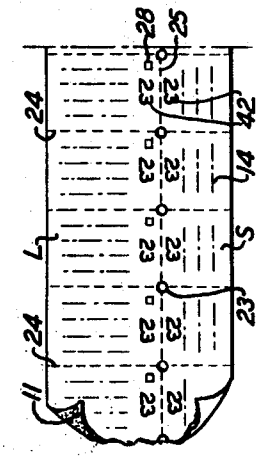


FIG. 3

INVENTOR
GEORGE W. VON HOFE
EDWIN K. WOLFF

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3,756,899

SYSTEM OF LABEL VERIFICATION CONTROL AND PRODUCT ACCOUNTABILITY

George W. von Hofe, Millington, and Edwin K. Wolff, Stockholm, N.J., assignors to New Jersey Machine Corporation, Hoboken, N.J.

Original application Feb. 12, 1968, Ser. No. 704,916, now Patent No. 3,607,537, dated Sept. 21, 1971. Divided and this application May 5, 1971, Ser. No. 140,433

Int. Cl. B32b 31/18

U.S. Cl. 156—521 9 Claims

ABSTRACT OF THE DISCLOSURE

The system herein comprises means for intermittently feeding to a label applying means, a continuous web having a width greater than the width of a given label and having provided on one longitudinally extending section thereof a series of labels for a given product, and having provided on a second longitudinally extending section thereof a series of indicia associated with the labels. The system further includes means to provide successively and simultaneously control information on both sections of the web as it is being fed to the applying means, means to progressively separate the second section from the first section after the control information has been provided thereon and moving it along a different path to a place of storage, means for successively separating the terminal labels from the first section, and means for transferring the separated labels to the applying means.

This application is a division of application Ser. No. 704,916, filed Feb. 12, 1968 by George W. von Hofe and Edwin K. Wolff for System of Label Verification Control and Product Accountability.

THE INVENTION

This invention relates to the preparation and use of labels in systems based on the employment of labels in a continuous web, often referred to as roll labels, and is more particularly concerned with a system employing such roll labels for purposes of label verification control and product accountability.

It has become increasingly important, especially in the sale of containers for pharmaceutical products, to provide on the labels therefore control elements such as batch numbers or code numbers for making sure that the correct labels is applied to a container for a particular product, for controlling the distribution of the packaged product, and for providing a record of its distribution. Thus, it has become vitally important that a manufacturer of a pharmaceutical prove out in his plant as the product is being labeled that the label that was applied to the container for such product is the right label for such product so that there can be no mistake as to the product in such container by the ultimate consumer. Such control information is now being applied to labels in the form of printed material such as code bars or other indicia, punched holes, etc. However, no satisfactory system has been devised by the art for keeping track of a particular labeled product after it has been labeled. This is important because the appearance of the product usually changes materially over an extended period of time. Thus, the label itself may change in color, the printing thereon will likewise change, and the adhesive material by which the label is attached to the product will lessen in its adhesive qualities. There is also the likelihood that the product itself will become less effective or toxic when subjected to certain conditions or storage or time. Accordingly, it is important that an up-to-date record of each specimen of a product be maintained until after it has reached the ultimate consumer and been used by him.

It is the primary purpose of this invention to provide an effective system of identifying a particular specimen of a product and for keeping account of it throughout the various steps of its manufacture and distribution until it reaches the ultimate consumer.

In accordance with such purpose, one of the objects of the invention is to provide a system which will enable the movements of any specimen of a product to be traced from the time such specimen is packaged at the plant until it reaches the ultimate consumer.

Another object of the invention is to provide a novel type of labeling machine capable of handling the novel type of label used in this system.

Other objects, as well as the advantages and features of novelty of the invention, will become apparent in the perusal of the following description when read in connection with the accompanying drawings, in which

FIG. 1 is a diagrammatic view showing a method of preparing the continuous web for the label machine;

FIG. 2 is a diagrammatic view showing a method of completing the web and applying the labels thereon to the product for which such labels were designed;

FIG. 3 is a plan view of a portion of label web showing one manner in which the same may be prepared;

FIG. 4 is a plan view of a portion of label web showing another manner in which the same may be prepared;

FIG. 5 is a plan view of a portion of label web showing still another form in which the same may be prepared; and

FIG. 6 is a front elevational view of a bottle provided with a label and tab in accordance with the invention.

FIG. 1 of the drawings shows diagrammatically the initial preparation in forming the labels of this invention, and while the steps illustrated in this figure are performed separately from the steps performed in the labeling machine depicted in FIG. 2, it will be understood that one or more of the steps shown in FIG. 1 may also be performed in the labeling machine. As is shown in FIG. 1 the web W on which the labels are printed is supplied in the form of a roll **10**. The web W is wider than that needed for the labels, being in fact wide enough to accommodate a longitudinally extending series of labels L and a longitudinally extending series of slit tags S in accordance with one embodiment of the invention, as shown in FIG. 3 of the drawings, or a series of labels L and a longitudinally extending series of tabs T, in accordance with another embodiment of the invention as shown in FIG. 4 of the drawings, or a series of labels L, slit tags S and tabs T in accordance with still another embodiment of the invention, as shown in FIG. 5 of the drawings. The web has provided on the back side thereof a layer **11** in FIG. 3 of suitable adhesive material such as a heat activatable thermoplastic. The adhesive layer **11** in each of the forms of the invention shown in FIGS. 3, 4 and 5 is provided or activated on that longitudinal portion or section of the web on which the labels L are provided and adhesive is not provided or activated on the longtitudinal section or sections of the web on which are provided the slit tags S and/or the tabs T.

In the arrangement shown in FIG. 1 of the drawings, the web W is fed from the roll **10** through a printing mechanism **12** of any suitable known construction capable of printing on the web a series of label indicia **13**, in FIG. 4, a series of record indicia **14**, in FIGS. 3 and 5, for the slit tags S, and a series of record indicia **15**, in FIGS. 4 and 5, for the tabs T. The printed areas bearing the indicia **13**, **14** and/or **15** may be contiguous or spaced as desired. The printing mechanism is operated in the customary fashion to apply the desired printing material to the web W in each period of dwell of the latter as it is advanced in a step-by-step manner by a pair of feed rolls **16**, **17** either designed to advance the web in such fashion or actuated by suitable reciprocating mechanism,

as is known in the art. Preferably the operation of the printer is controlled by a microswitch **18** electrically connected to the printer **12** by wires **19** and operable by a cam **20** carried by the shaft of the driven feed roll **17**. The cam **20** is adjustably mounted on such roll shaft to actuate the microswitch **18** and thereby to operate the printer **12** every time the cam comes to the position in its rotary movements at which the web W will be in a dwell condition. Located at a given distance in advance of the printer **12** is a solenoid type of punch **21** connected by wiring **22** and **19** to the microswitch and adapted to be actuated with the printer **12** in the dwell positions of the web to punch holes **23** in such web (note FIGS. 3–5). The punch device **21** is spaced a given number of label lengths in advance of the printing mechanism of the printer **12** and so located in a transverse direction with respect to such mechanisms that on each operation thereof it will punch a hole **23** at the intersection of the transverse junctures of the labels L which are indicated by the lines **24** in FIGS. 3–5, and the longitudinal junctures of such labels with the slit tags S in the embodiment of FIG. 3 and indicated in the latter by the lines **25**, or the longitudinal junctures of such labels with the tabs T in the embodiment of FIG. 4 and indicated in the latter by the dotted lines **26**, and at the intersection of such label junctures **24** and the longitudinal junctures of the slit tags S and tabs T in the embodiment of FIG. 5 and indicated in the latter by the lines **27**. There is thus provided in the web a means for verifying the labels as will be hereinafter explained, and with respect to those webs on which slit tags S are provided as in the embodiments of FIGS. 3 and 5, such holes **23** also facilitate a clean separation of such slit tags S at the connected corners thereof. As has been previously indicated, instead of such holes **23**, the printing mechanism of the printer **12** may be arranged to print code indicia on either the labels L, the slit tags S or the tabs T for verification of the labels prior to their application to the containers for the products, as indicated by the numeral **28** in FIGS. 3–5, and in such case the punch device **21** would be dispensed with.

After the labels L, slit tags S and tabs T have been printed on the web, and the verifying indicia such as the holes **23** or printed matter **28** have been so applied the web is examined for imperfections at a station **30** which may be in line with the printer as indicated in FIG. 1 or conveniently located at some other place. Any imperfections found in either the material of the web, or in the printed matter on the web are cut out of the web and its continuity restored by splicing in the usual manner as indicated at **31** in FIG. 1. The completed web is then wound into a roll **32** for use in the labeling machine.

The web W forming the roll **32** depicted in FIG. 2 of the drawings, has by way of example and for purposes of disclosure, been prepared in the manner shown in FIG. 5 of the drawings to include longitudinally extending series of labels L, tabs T and slit tags S. In the labeling machine shown in FIG. 2 which is constructed in accordance with the invention, the roll **32** is rotatably supported by any suitable means, such as pin **35** secured at one end to a bracket provided in the machine. The labels, tabs and tags are fed from the roll **32** by draw rolls **36** into a supply loop **37** from which they are drawn in a step-by-step fashion by intermittently operating draw or register rolls **38** located adjacently to a cut-off knife **39**. The portion of the web of labels drawn from the supply loop **37** moves past a cutting device **40** of known construction and capable of perforating the web along the longitudinal line of juncture of the tabs T and the labels L as indicated in FIG. 5 by the dotted line **26**. There is thus left only narrow connecting portions of the web material joining the longitudinal series of labels L with the longitudinal series of tabs T, thus making it possible to readily separate a tab associated with a label applied to a product container.

After the web W has been perforated, it passes through the jaws of an imprinter **41** movably mounted on the machine frame so that it may be adjusted to print on particular portions of the label L, tabs T and slit tags S as such labels are successively stopped between such jaws in the intermittent feed of the web W. The imprinter **41** is of known construction in this art and is provided on its upper jaw with suitable type against which the type ribbon and the label web are struck by the movable lower jaw thereof; such lower jaw, as is known, being electrically actuated upwardly to strike the web of labels against the web W which in turn hits the type to cause the desired imprints to be made of the upper side of the web. In accordance with the invention the operation of the imprinter **41** is controlled by a scanning device **45** as will hereinafter become more clear. The type carried by the imprinter **41** is constructed to print on each label L, each tab T and each slit tag S, a given number. As is indicated in FIG. 3 of the drawings by the reference numeral **42**, the imprinter **41** may be constructed to print fixed numbers such as the indicated number "23" so that each label, tab and slit tag on the web will be provided with the same number. It is also contemplated that the imprinter may be constructed to print sequential numbers, in which case as is indicated in FIG. 5, each transversely associated label, tab and slit tag will be provided with the same number of a sequence thereof and different from the numbers in the sequence given adjacent transversely associated label, tab and slit tags. Thus, the transversely associated label, tab and slit tag designated generally by the reference numerals **43** in FIG. 5 may each be given the number "26" in a sequence, and the transversely associated labels, tabs and slit tags adjacent thereto given the numbers "25" and "27" in such sequence, as indicated. The numbers selected may be such as to indicate particular batches, and/or date or dates on which the product is labeled, and/or the particular labels in the series thereof, etc. It will be understood also, that while numbers have been given for purposes of illustration other printed indicia may be employed in any form or combination. It will also be understood that it is within the contemplation of the invention to use instead of the imprinter **41**, other devices capable of providing the desired accountability indicia on the labels, tabs and slit tags, such as for example a device constructed basically similar to the imprinter but designed to provide punched hole combinations capable of accomplishing the purposes of the invention.

After passing through the imprinter **41**, the web is scanned by a scanning means **45** of known construction and embodying any suitable known sensing means for detecting the register markings **23**, such as for example, known optical-electrical and magnetic-electrical detecting means. In the embodiment illustrated, the register markings **23** are in the form of holes and accordingly a known type of photoelectric registering control device may be employed to scan the same. Whatever the type of markings **23** and scanning means **45** employed, such scanning means is arranged to scan the particular portions of the web on which the register markings **23** are provided and to send a signal when it detects each of such markings. As has been previously indicated the markings **23** illustrated are holes that have been particularly placed on the web to serve a dual purpose. However, it will be understood that the register markings **23** may be provided on other selected portions of the web for accomplishing the registering operation. The signals created in the scanning means are sent to suitable means for controlling the register rolls **38** to stop the feed of the web each time the terminal label comes into registry with the cut-off knife **39** for the cutting operation. Suitable means for effecting this operation is known to the art and one form of which is disclosed for example in Pat. No. 3,536,550 issued to George W. von Hofe on Oct. 27, 1970. The electric eye scanning means **45** is also electrically connected to and controls the imprinter **41** which is constructed in a manner known

to the art so that every time the beam of said scanning means comes into registry with a hole **23** the signal created thereby will cause the imprinter **41** to print. The markings **23** and scanning means **45** may be utilized to perform an additional function, namely the verification of the labels that are being applied to the product. When used for such purpose the markings **23** may be provided on a particular portion of either the label L, the tab T or the slit tag S in each transverse associated set thereof which is so located on such set as to provide a combination which is unique with such label for a particular product and different from such a combination provided on another web bearing labels for a different product. The scanning means in such arrangement may have associated with it a microswitch **46** and be so constructed with timing means of known construction that if it does not read a marking **23** within the interval it would normally take to feed a label length therethrough, it will at a short interval thereafter send a signal to stop the feed of the register rolls **38** as above described and simultaneously send a signal to the microswitch **46** to cause it to control the motor circuit of the machine, or a light or sound signal, such as the signal device indicated generally in FIG. 2 of the drawings by the reference numeral **47**.

The web W is advanced from the scanning means **45** by the feed rolls **38** into registration with the cutting blade **51** of an edge trimmer **50**. The blade **51** is dependent from the outer end of an arm **52** adjustably secured by a key to a shaft **53** rotatably supported by bearings **54, 54** mounted on a bracket plate in the machine. Also mounted on shaft **53** is an arm **55** connected by a rod **56** to a cam lever **57** mounted on a stub shaft **58** and carrying a cam roller engageable with a cam track in one face of a cam **59** secured to driven shaft **60**. The shaft **60** is continuously driven by the main shaft of the machine through a transverse shaft **61**. It will thus be seen that in the cycling operations of the machine the cam **59**, through lever **57**, connecting rod **56**, arm **55**, shaft **53** and arm **52**, will impart a reciprocating movement to the blade **51** and cause it to make a cutting stroke in each period of dwell of the web W. Associated with the blade **51** is a fixed knife **64** adjustably secured to the bracket plate. It will be noted that the blade **51** has a cutting edge of a length approximating the distance between centers of the two aligned holes **23** associated with each slit tag S so the ends thereof will enter such holes in the cutting stroke of the blade. The blade **51** will therefore make a clean cut without tearing the web material at its ends to sever one slit tag S from its associated tab T and label L. The intermittently separated web strip section **62** of slit tags pass around a guide roller **65** in advance of the edge trimmer **50** and then downwardly to a rewind reel **66** mounted on a shaft **67** of a small windup motor **68** provided with a constant torque. Motors of this type which always want to turn but which may be prevented from turning without overheating by the strip **62** during the dwell periods of the web, are available to the art. Thus, as the label web passes through the label machine the slit tags S which have all the desired information thereon are progressivey collected on the reel **66** and in such condition may be filed away by the manufacturer until needed.

The terminal labels L and their associated tabs T are severed from the strip and transferred to a label applying drum **70** by mechanism which is similar to and described more in detail in Pat. No. 3,522,134 issued July 28, 1970 to George W. von Hofe, et al., for High Speed Labeling Machine. It is believed only necessary for the purposes of this disclosure to state that the terminal labels and tabs severed by the cut-off knife **39** are successively fed by a vacuum transfer device **71** to vertically disposed label carrying plates **72** which are mounted on a drum **73** and which successively deposit the labels and tabs on the label applicators **74** forming part of the label applying drum **70**. As the labels are fed by the drum **70** to the label applying station, the labels L are adhesively activated by means of heat in any suitable manner known to the art (note for example said Pat. No. 3,522,134), the layer **11** of adhesive material already provided on the labels, or if such layer **11** is not initially provided thereon, by applying glue to such labels without applying the same to their associated tabs, in any suitable maner known to the art. At the label applying station, the label applicators **74** of drum **70**, successively press the central portions of the adhesively activated labels L to successive articles **75** being fed past such station by a conveyor **77** and a belt **76** in the manner disclosed in said Pat. No. 3,522,134. The labeled articles pass from the label applying station to suitable pressure means generally designated **80** of any suitable type, such as is disclosed for example in said Pat. No. 3,522,134, to press the label into complete adhering relation on the article. The article **75** with its attached label and tab will then have the form shown in FIG. 6 of the drawings.

It will be understood from the foregoing, that in the practice of the system of this invention, the label web may be prepared in the manner illustrated in either FIG. 3, or FIG. 4 or FIG. 5 of the drawings. Assume for the purposes of explanation that it is prepared in the manner of FIG. 5 wherein it will be provided with both the tabs T and the slit tags S of FIGS. 4 and 3, respectively. As before described, in such preparation of the web, the labels L will be provided with the proper label indicia **13**, the tabs T and slit tags S will be provided with the information **15** and **14**, respectively, needed for recording purposes in regard to the labels L, and code markings such as the holes **23** will be provided on the web for registration control by control of the operation of the feed rolls **38**, for control of the operation of the imprinter **41**, and for verification control through the microswitch **46** and signal device **47**. The holes **23** have the added advantage that they enable the blade **51** of the edge trimmer **50** to provide clean cuts in separating the slit tags S from the web.

In its travel through the label machine, the thus prepared web is perforated by the cutting device **40** to facilitate the separation of the tab T from the label L while they are attached to the article, and to enable this to be accomplished with a minimum of damage to the applied label. Each transverse set of labels L, tab T and slit tag S, at least, are then provided with similar code indicia, such as the fixed numbers **4** in FIG. 3 or the sequential numbers shown in FIG. 5, to designate the batch from which the article is filled, the date of filling, or any other factors desired to be made of record, as the labels are on their way to be attached to the articles. The slit tags are then progressively separated from their labels and stored on reels **66** for the manufacturer's records, such reels being suitably labeled to indicate the code numbers, or range thereof on th slit tags stored thereby. After the slit tags have been separated from the labels, such labels and their attached tabs are progressively adhered to the articles. Since the adhesive is only active on the label the tab T will be free of the article so that the completed article will have the appearance shown in FIG. 6 of the drawings. In this condition, the article is sent to inventory and then sent to the distributor on order. The code indicia on the label and tab will enable both the manufacturer and the distributor to control the flow of their stock so that the articles first in will be first out and no article will be lost or retained too long a time by either. When the article is sold by the distributor to a consumer he removes the tab T and retains it for his records so that there is also a record of the particular consumer to which a particular container of a particular bath of a particular product has been delivered. Thus, in this system there will have been proved out that there is the right label on the right product that is desired by the ultimate consumer, and that in the event this particular product needs to be traced for any reason, the distributor's and manufacturer's records

will readily show who is the ultimate consumer thereof and the history of such product from the time the label had been applied thereto.

While we have hereinabove described and illustrated in the drawings, a preferred embodiment of our invention, it will be apparent to those skilled in the art that changes may be made therein without departing from the spirit of the invention or the scope of the appended claims.

What is claimed is:

1. The system of controlling the use of labels on packages which comprises means for applying labels to articles, means for intermittently feeding to said applying means a continuous web having a width greater than the width of a given label for a package for a particular product and having provided on a first longitudinally extending section thereof a series of labels for a given product, and having provided on a second longitudinally extending section thereof a series of indicia associated with such labels, means to provide successively and simultaneously corresponding control information on each label and its associated indicia on both sections of said web in the intermittent feed of the web to said applying means, means to progressively separate said second section from said first section in the feed of the web toward said applying means, means to collect and store the second section of the web after it has been separated from said first section thereof, means for successively severing by transverse cuts of the web the terminal labels from said remaining first section of the web, and means for transferring the separated labels to said applying means.

2. The system defined in claim 1, including means for perforating said web along a longitudinal line located between said series of labels on said first section thereof, and said series of indicia on said second section thereof.

3. The system defined in claim 1, in which said progressive severing means comprises a member constructed and arranged to sever said second section from the web by longitudinally extending cuts disposed parallel to the feed of the web.

4. The system defined in claim 1, in which said collecting and storing means is associated with said progressive severing means and progressively stores the second section as it is cut from the web.

5. The system defined in claim 3, including means controlled by control material provided on said web for periodically operating said means for providing corresponding control information on both sections of said web during the periods of dwell of said web in its travel to said applying means.

6. The system defined in claim 3, including means to provide a longitudinally extending series of holes spaced apart so that the distances between their centers equals the longitudinal dimension of the labels, and in which said severing means member makes successive cuts extending between and into adjacent holes in said series.

7. In a labeling machine, means for feeding to a place of label application a continuous web having a series of labels provided along one longitudinal section thereof, means for successively and simultaneously providing corresponding information on said one longitudinal web section in association with each label and on a portion of another longitudinal section of the web adjacent each label, first means for successively separating the portions of the two web sections on which the corresponding information had been provided as the web travels toward said place of label application, means associated with said first means for collecting and storing the separated other longitudinal web section, second means spaced in advance of said first means for successively separating the terminal labels from said one longitudinal web section, said feed means including means located between said first means and said scond means for drawing said one longitudinal web section through said first means and advancing it to said second means, and means for applying the severed terminal labels to articles at said place of label application.

8. In a labeling machine as defined in claim 7, in which said first means comrises an intermittently operated cutting blade constructed and arranged to cut the web along the juncture of said two web sections and parallel to the direction of travel of said one longitudinal web section to said place of label application, and in which said second means comprises an intermittently operated cutting blade constructed and arranged to cut said one longitudinal web section transversely to said direction of travel thereof.

9. In a labeling machine as defined in claim 8, in which said feed means located between said first and second means is constructed and arranged to successively and simultaneously register spaced labels on said one longitudinal web section with said first means and said second means.

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CHARLES E. VAN HORN, Primary Examiner

U.S. Cl. X.R.

156—510, 511, 513; 83—255, 408; 101—90