Jan. 25, 1955 R. H. HOLMWOOD 2,700,556

CONTINUOUS FORM WITH SEPARABLE PORTIONS

Filed Aug. 17, 1951

3 Sheets-Sheet 1

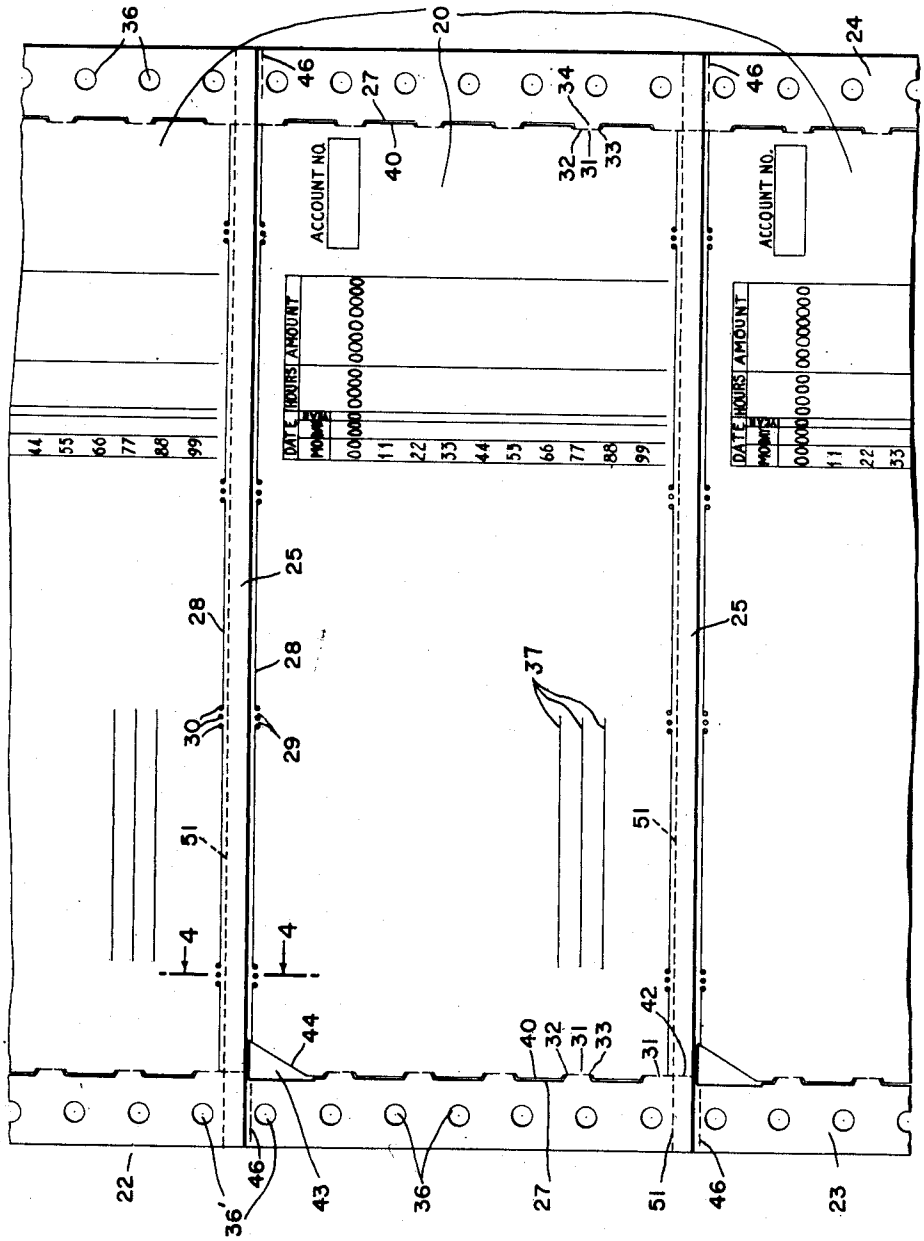


FIG. 1

INVENTOR
R. H. HOLMWOOD

BY
J W Armbruster
ATTORNEY

Jan. 25, 1955 R. H. HOLMWOOD 2,700,556

CONTINUOUS FORM WITH SEPARABLE PORTIONS

Filed Aug. 17, 1951 3 Sheets-Sheet 2

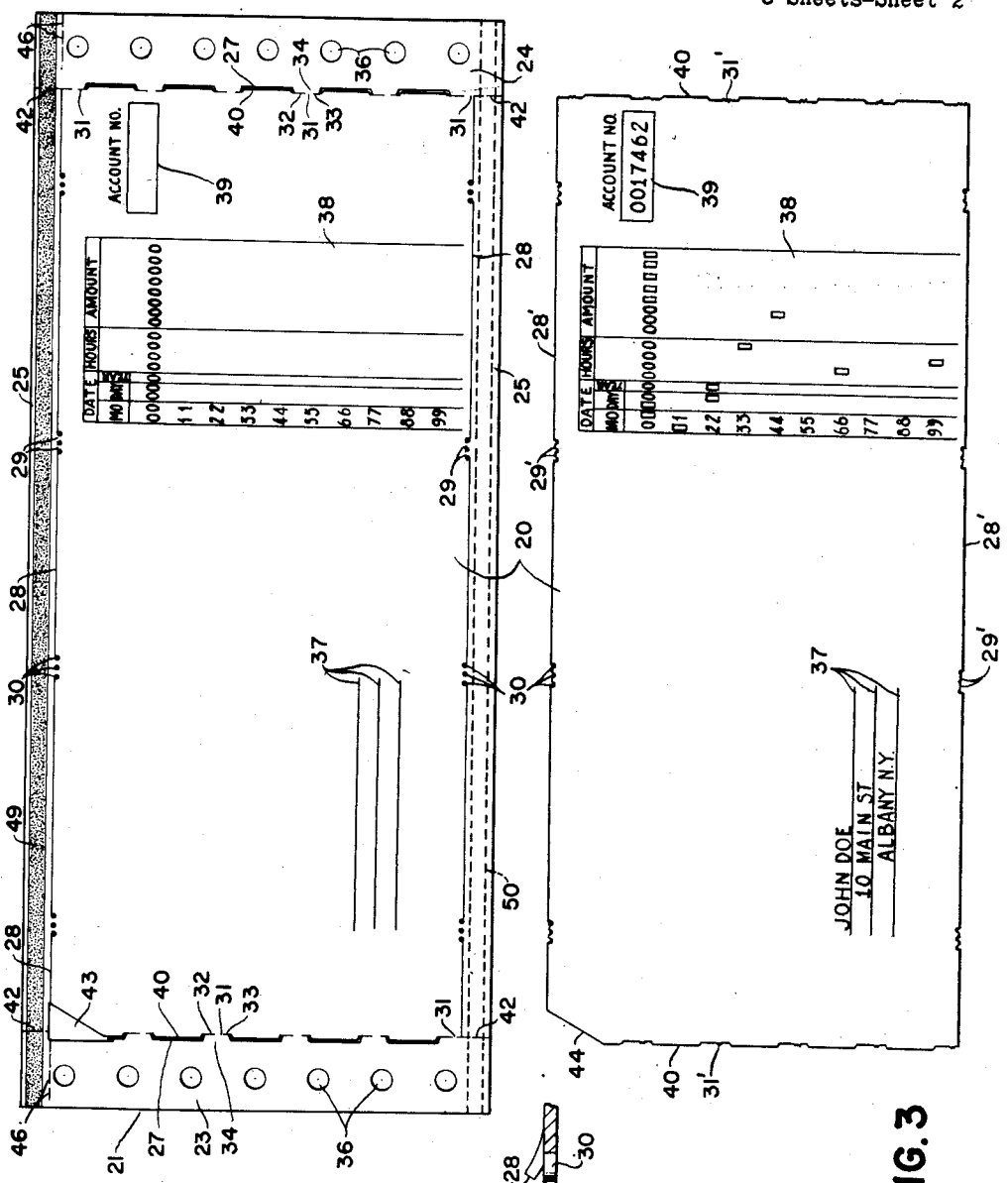


FIG. 2

FIG. 3

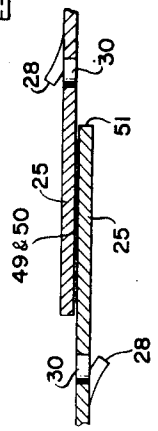


FIG. 4

INVENTOR
R.H. HOLMWOOD

BY J W Armbruster
ATTORNEY

Jan. 25, 1955 R. H. HOLMWOOD 2,700,556

CONTINUOUS FORM WITH SEPARABLE PORTIONS

Filed Aug. 17, 1951 3 Sheets-Sheet 3

FIG. 5

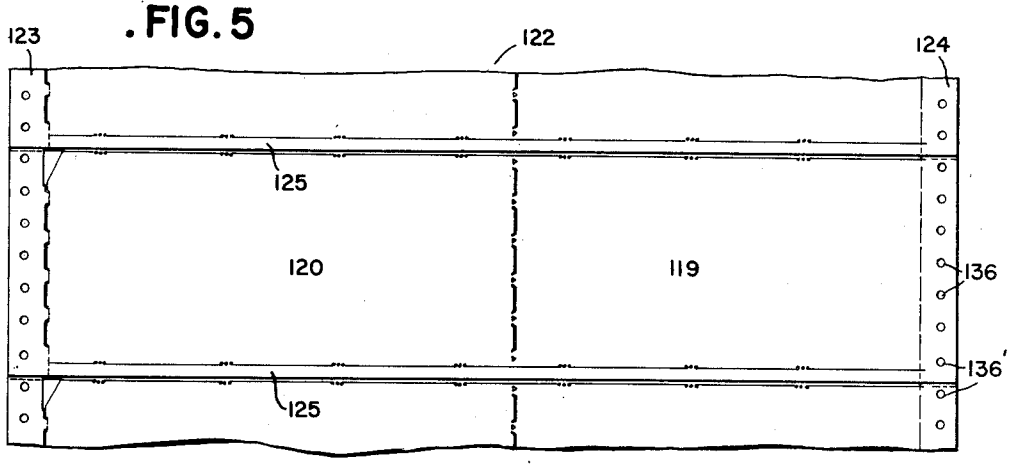


FIG. 6

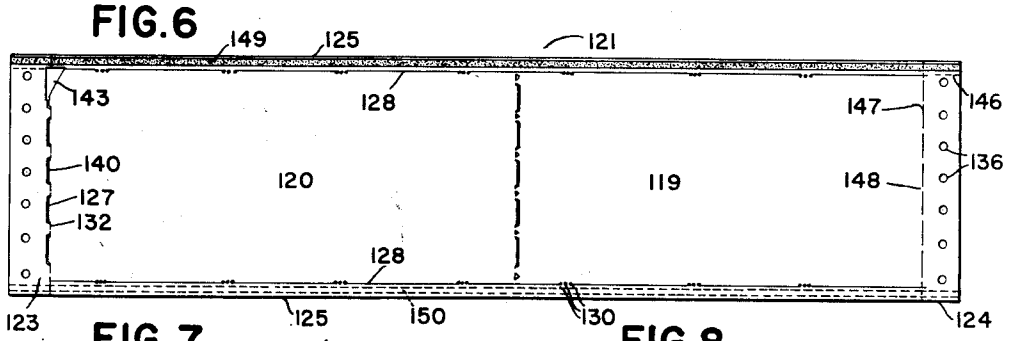


FIG. 7

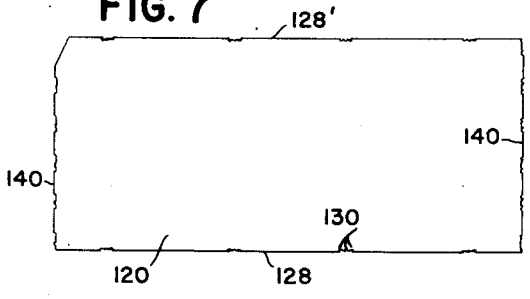


FIG. 8

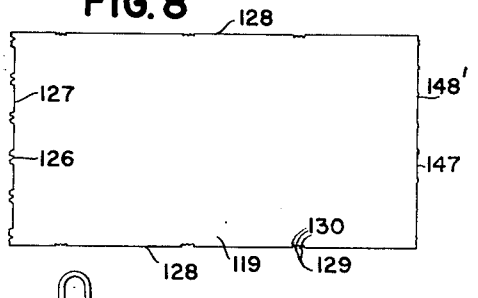


FIG. 9

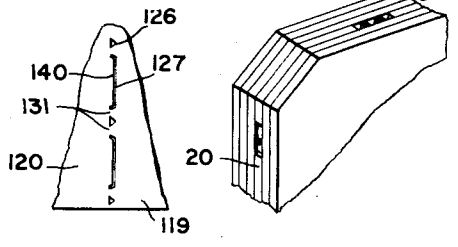
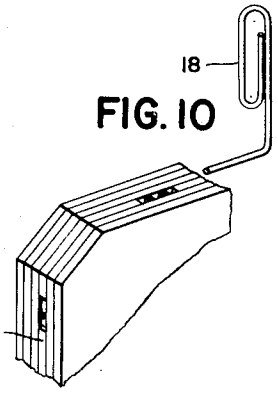


FIG. 10



INVENTOR
R. H. HOLMWOOD

BY
J. W. Armbruster
ATTORNEY

United States Patent Office 2,700,556
Patented Jan. 25, 1955

2,700,556

CONTINUOUS FORM WITH SEPARABLE PORTIONS

Richard H. Holmwood, Binghamton, N. Y., assignor to International Business Machines Corporation, New York, N. Y., a corporation of New York

Application August 17, 1951, Serial No. 242,198

6 Claims. (Cl. 281—5)

This invention relates in general to an improved kind of continuous form stationery and more particularly to continuous form connected tabulating cards.

Heretofore, separate tabulating cards in the form of checks or bills, etc., were fed singly into the printing devices of a tabulator, but in bringing such separate pieces of record material into the printing position, difficulties arose in endeavoring to maintain alignment and in trying to put the lines of print in the exact spaces provided therefor in the pre-printed form data appearing on such business instruments. Another shortcoming of the old system lies in the possibility of failure to feed a separate piece of record material with the result that the machine continues to operate without any indication being given that a certain check or bill is not printed.

Therefore, an object of the present invention is to so form a tabulating card blank so that it is suited for connection to similarly shaped blanks to form a continuous series of connected business instruments in the form of tabulating cards. This continuous form web is then suited to be brought into a succession of several exact line space positions relative to the recording line of a recorder such as a tabulator.

An object is to provide a tabulating card blank with a pair of separable marginal pin feed strips.

Another object of the invention is to provide a tabulating card blank with upper and lower end connecting strips designed to be used for connecting a series of such blanks as continuous form stationery before recording and also designed to be separated from the card after recording has been performed thereon.

Another object of the invention is to provide a tabulating card blank wherein the tabulating card proper is completely surrounded by separable marginal conveying material constituting means for connection and feeding as a continuous web.

Another object of the invention is the provision of a tabulating card blank provided with separable top and bottom strips each having an area of adhesive thereon for connection to similarly constituted blanks to form a continuous web of series connected blanks. The two opposite faces of the end strips are provided with adhesive so that the opposite end of an adjoining blank may be connected thereto in a shingled fashion so that successive blanks overlap each other in a similar fashion. The adhesive area of the top or bottom portions is smaller than the area defined by the slits of a tearing line so that the shingle connection between successive cards includes extending portions extending beyond the adhesively connected portions, said extensions insuring that a space is preserved between the adhesive connection and the tearing line so that the adhesive material at no time approaches the edges of the tabulating card proper.

In the past some business instruments have taken the form of separable parts of continuous stationery, but they do not take into consideration the exacting needs of tabulating card requirements. The card dimensions as to height and width must be held to close limits and all outer edges must be sharp, straight and clean. An object of the invention is to provide a tabulating card so enclosed in an enlarged blank that all marginal areas are separable therefrom in such a fashion as to leave the card with straight aligned edges.

Another object of the invention is the provision of a tabulating card blank with a pair of marginal pin feed strips separable therefrom by a tearing line comprising

recessed slits connected with small areas of material joining card and the marginal strips.

An object of the invention is the provision of a machine control element with tearing indentations on all sides to make it readily distiguishable even when stacked with other ordinary cards. Such indentations are also useful as an engaging means for an instrument to catch on for pushing an indented element out of a stack of control elements.

Another object of the invention is the provision of a tabulating card blank comprising upper and lower end areas distinct from the card area, said end areas containing several groups of small holes spaced closely together and arranged tangentially to the card area, said groups of holes being connected with slits, said slits defining the separating line between the card area and the end areas.

Another object of the invention is the provision of a tabulating card blank wherein the card area proper is completely surrounded with separable marginal material and wherein one corner between said card area and said marginal area is cut out with a triangular area having extending side areas to provide a bevel portion at one corner of said card area.

Another object of the invention is the provision of a tabulating card having all four edges including recessed areas wherein frayed, tearing edges are concealed.

Other objects of the invention will be pointed out in the following description and claims and illustrated in the accompanying drawings, which disclose, by way of examples, the principle of the invention and the best mode, which has been contemplated, of applying that principle.

In the drawings:

Fig. 1 is a detailed view showing a series of connected card blanks together forming a portion of continuous form stationery.

Fig. 2 is a view showing a blank or unit of such continuous form stationery, said unit comprising a tabulating card blank wherein the card area is completely closed by separable marginal strips.

Fig. 3 is a detail view showing a break out form of tabulating card after it has been separated from the marginal strips and the end connecting strips of the continuous web of Fig. 1.

Fig. 4 is a sectional detailed view taken along the line 4—4 in Fig. 1 and showing the adhesively connected shingled portions of two adjacent card blanks.

Fig. 5 is an assembly view showing continuous card web of a modified variety wherein each blank includes a stub card as well as a tabulator card.

Fig. 6 is a view showing one stub blank of the kind used in Fig. 5.

Fig. 7 is a view showing one of the tabulating cards after it has been separated from the marginal portions shown in Fig. 5.

Fig. 8 is a view showing the stub portion of the card blank of Fig. 6 after it has been separated from the card and the marginal strips shown in Fig. 5.

Fig. 9 is a detail view showing the kind of tear line cutouts used between the card and stub card in the blank of Fig. 6.

Fig. 10 is a perspective view showing a corner of a stack of tabulating cards with a break out card readily distinguished and formed to be pushed out with an instrument.

In order to illustrate the invention, the work piece (the element which receives recorded data) is taken to be a Hollerith kind of tabulating card **20** as shown in Fig. 3. This card **20** is shown in Fig. 2 to be the center piece or interior break out element of a continuous form blank **21** which is a rectangular record material portion of a continuous web. A series of such blanks **21** are stuck together shingle fashion to form a web or chain of records **27** as shown in Fig. 1 where a portion of the completed continuous form stationery is pictured as it appears when ready to be threaded onto the pin feed devices of a recording machine. After recording has been performed on the web **22** the interior cards **20** are broken out and the marginal strips **23**, **24** and end strips **25** are discarded.

An advantage of the featured construction is that of

perfect registration of the record receiving lines such as lines **37**, Figs. 2 and 3, with the record producing line in the recording machine. That is brought about by the invariably true relationship between such lines **37** and the positions of the accompanying marginal pin feed perforations **36**. Heretofore it was difficult to feed separate small pieces such as cards and attain good recording registration in a recording machine.

Among the other advantages of the novel piecing mode of web construction may be noted the compact, easily stored and handled nature of the unit blank **21** of Fig. 2. Then there is also the economical factor of the small flat die it is possible to use to make such blanks and the ease of maintaining close limits of dimensions in such a compact form.

When the blanks **21** are attached to each other, the pin feed perforations **36** act as registration points to insure not only correct spacing within the related blank but also of the proper spacing of the two other adjacent blanks above and below.

A still further advantage of this disclosure resides in the production of clean straight edges on all card margins after separation from end and marginal strips. In Fig. 1 it is shown that the shingled attached portions **25** of two blanks are connected short of the lines of slits **28** or lines of weakness of two adjoining cards, thereby insuring clean straight edges on all sides and even the connected edges.

For a detailed explanation of the invention, reference may be made first to Fig. 2 for the showing of the blank before it is assembled as part of the web. There it is noted that the interior break out card **20** is completely surrounded by the two side margin strips or tapes **23** and **24** and the upper and lower end strips **25** of the continuous form blank **21**. The entire blank **21** is of one piece and one thickness and is illustrated as of card stock for the purpose of providing a standard card **20** when the latter is broken out. Although the interior card **20** is in the main separated from the blank by precut openings such as cutouts **27** and slits **28**, it is connected thereto on all sides by a series of small spans and tiny ties of connective material such as the spans **29** between perforations **30** and the ties **31** between small slits **32** and **33** at the inner ends of tabs **34**. These spans and ties are of sufficient tensile strength to hold the card intact while passing through a recording machine and yet offer very little resistance to the shearing or tearing action incident to the breaking out of the card by pushing and tearing at the connections by hand or by machine bursting action.

Both of the marginal side strips or tapes **23** and **24** are cut with a series of evenly spaced pin feed perforations **36**. It is important that these perforations **36** are not only in vertical and horizontal alignment on the blank, but also of a definite relationship with reference to the end strips which are to be attached to similar ends for a continuation of the lines of feed perforations **36**. There is also the provision of precise vertical and horizontal relationships between the positions of the feed perforations **36** and the positions of predetermined print or punch receiving lines **37**, fields **38** and blocks **39**. One of the main reasons for the integration of the card with the feed tapes is that it provides a means for positioning the card to the exact record receiving points in the machine by the use of pin feed wheels.

The side margins **23** and **24** are also cut with openings or cutouts **27** which not only set up lines of weakness at the two sides, but also provide inner walls **40** which become the straight aligned side edges of the card **20**, Fig. 3, when detached. Since these side edges **40** are all cut in the same die they can be held to close limits of dimensions as required of accounting machine control elements such as tabulating cards.

Between the succession of cutouts **27** down the inside of the marginal strips, there are the inwardly projecting tabs **34** which serve to place slits **32** and **33**, tie **31** and the resulting tearing fringe **31**[1] (Fig. 3) within the outer bounds of the card as defined by the outer edges **40**. This construction with recessed slits and recessed tearing ties **31** insures the production of the element or card **20** with clean straight sides because the tearing fringes **31**[1] can never project near or beyond the outer edge defined by edges **40**.

Other sets of small slits **42** are cut at the top and bottom of the side margins **23** and **24** and aligned with cuts **32**, **33** so that the entire vertical length of marginal strip is separable from the card and both end strips **25**.

At the upper left corner of the card **20**, Fig. 2, a triangular piece of material is cut out to leave the triangular opening **43** which provides the bevel cut **44**, Fig. 3, on the card. In Fig. 2 it is noted that the triangular opening or cutout **43** is large enough to extend into the material outside of horizontal slit **28** and to the left of the top cutout **27**. In that way all edges around the bevel are produced straight and clean and without tear fringes.

Turning now to consideration of the end strips it is seen in Fig. 2 that they are narrow horizontal pieces of stock at the top and bottom of blank **21**. These end strips **25** are separated from the inner card by four groups of small perforations **30**, with three closely spaced perforations in each group. The outer periphery of the perforations **30** coincides with the outer edges of the card and it is along this outer line, tangent to the perforations, that the slits **28** are cut between groups of perforations and cut directly into the two outer perforations of the three and cut therein at points coincident with the outer edges of the perforations. In this way, the line of weakness across the spans **29** between the holes is along a line through the centers of the small circular perforations **30**. As a result, when the card is torn out, the tear fringes **29**[1], Fig. 3, are along a line of weakness within the top and bottom edges **28**[1] and no fringe extends outside the clean straight end edges provided by slits **28**.

The slits **28** at both ends and at the top and bottom all extend out to the corners of the card and thus provide clean straight top and bottom edges **28**[1].

As extensions of the slits **28** at the top there are a number of short cuts **46** arranged horizontally across the side margin strips **23** and **24**. This makes it possible to separate the marginal strips into short pieces although, as a rule, the marginal strips or tapes are torn off in long continuous pieces which is also possible here if the material between cuts **46** is not burst.

Each blank **21**, Fig. 2, is gummed so that it may be attached at both top and bottom to a pair of similar blanks to form part of a chain or web of continuous stationery. Two narrow horizontal stripes or bands **49** and **50** of adhesive material are placed on the blank and extend across the entire width of it. The adhesive stripe **49** at the top is on the upper face of end strip **25** and the other stripe **50** at the bottom is on the under side of the lower end strip. The edges of the adhesive material are well within the borders of the end strips **25** so that there is no chance of it being pressed out onto adjacent card stock. A coloring matter is added to the adhesive so that it is apparent on sight whether the blank is completed and ready for effective joinder to others of the same kind.

The adhesive is of a nontacky kind which is ineffective at normal temperatures and pressures and not responsive against clean dry paper stock so that the blanks are to all ordinary purposes dry and smooth and may be stacked after the adhesive is applied. The nature of the adhesive used is that of a thermoplastic adhesive of the kind effective when brought forcibly into contact with an area similarly treated but otherwise offering no interference to stacking and sliding the blanks one over the other. An adhesive found effective is the Cascorez adhesive of the Borden Co., particularly the one with experimental number CV25–64A.

The dye added to the adhesive comprises 5% of Du Pont methyl violet base, and 95% of oleic acid. The mixture is 1 oz. of dye to 20 oz. of adhesive, more or less to vary the color as desired.

When a pair of blanks are to be joined, they are brought together as shown in Fig. 1 with the bottom end strip **25** of the top blank overlapping the top end strip **25** of the lower blank to form a shingled connection of the two. At the inside of the shingle connection or lateral crosstie, Fig. 4, the two layers of adhesive meet and are fused by heat and pressure. Before fusing them, the two blanks are positioned precisely so that the distance between the two pin feed perforations **36**[1] of adjacent blanks is the same as the spacing of feed perforations **36** within all blanks. After positioning the blanks a heated bar or roller is applied at a pressure of from 75 to 150 pounds per square inch and at a temperature of from 200° F. to 275° F. As a result the two blanks are connected as integral parts of a continuous stationery web which can

be made of any length by a succession of connecting operations. After production of the web it may be stored on a roll or fan folded along slits **28** and **46** until operated upon in a recording machine.

The assembled blanks **21** in the form of a continuous web **22** may be described further with reference to Figs. 1 and 4. In Fig. 1 it is seen that the shingled portions or lateral crossties made up of the two layers of end strips **25** are arranged so that the overlapping material does not reach to the two lines of slits **28**. In this connection, the dotted lines **51** representing the top edges of the underlying strips is not to be confused with the short tear line cuts **46**. From Fig. 4 it is clear that the joined adhesive stripes **49** and **50** do not extend beyond the edges of shingled crosstie. However, if it should, there is an additional margin of material between the end **51** of one blank and the slit **28** of the next blank. In Fig. 4, portions of the card stock at the slits **28** are bent outward in an abnormal way to emphasize the relationship of the slits **28** with respect to the walls of the small perforations **30** and the edges of the joined crosstie.

The shingled crossties **25** and the marginal strips **23** and **24** are merely carrying means for holding and conveying the centralized cards **20** to and through a recording machine, after which they are disposable parts to be torn apart by hand or machine and to leave behind the work piece or card **20** suited to be read and to act as a machine control element.

In Fig. 3 a sample break out element or card **20** is shown as it appears after conveyance by the web strips and after such strips have been torn off. It is noted that all edges **28**[1], **40** and bevel **44** are clean, straight and properly aligned. Also that the printing and punching therein is properly placed not only with respect to all edges but also with respect to the preprinted lines, fields and blocks. The small indentations between edges **40** and the minute notches caused by holes **30** do not have any effect on the performance of the card **20** which is to all purposes as excellent as the ordinary card which is without the break out advantage.

The indentations along the edges of the card of Fig. 3 are of value for identification purposes to single them out on all sides when stacked with ordinary cards. Therefore, cards of the break out form when preserved for a certain class of accounting are easily distinguishable even when stacked with other cards and thus prevent errors due to mixing of cards of different classes of accounting. In Fig. 10 is shown how the edge differences are apparent on different sides of a stack and how the one break out card is easily singled out.

Another use of the indentations is as a means for pushing or sliding the card formed with them out from a group of cards. By the use of a thin blunt instrument such as the end of a paper clip **18**, Fig. 10, it is possible to offset from the stack the one indented card out of all the others. By merely running the clip end across the edges of the cards at the line of indentations, a shoulder of one indentation is engaged and the break out card is pushed out of the stack. Therefore such a card may be used as a separator of groups, a master card, address card, or for other special distinguishing uses.

In Figs. 5–9 a modified form of continuous card stationery is shown involving the addition of stub card **119** alongside each card **120** which is similar to the tabulating card **20** already described. In the main most of the features of the construction of the blank **21** of Fig. 2 are also found in the stub blank **121** of Fig. 6. There it is seen that the cutouts **127**, **130** and **143** are similar to such features already described. The slits **128**, **132**, etc., are also the same as on the single card blank form. The adhesive stripes **149** and **150** are also arranged on end strips **125** the same as described hereinbefore with reference to Figs. 2 and 4.

One difference is found in the connecting means and tearing line between the two cards **119** and **120**. Between pairs of cutout slots **127**, shown enlarged in Fig. 9, are small triangular holes **126** with the left vertical bases of the triangles aligned with left extreme of the slanted ends of the slots. Thus a tear line along such bases is prepared to occur inside the right hand outer edges **140** of the card **120**. The stub **119** is the less important of the two, so the tearing fringe at points **131** is allowed to extend therefrom.

Another constructional difference is found in the tear line separating the stub **119**, Fig. 6, from the right hand marginal pin feed tape **124**. The line is composed of simple straight slits **147** alternating with small connecting ties **148**. This is an economical form of construction and results in the tearing edge shown at the right edge of the card **119** in Fig. 8 with straight edges **147** interspersed with small tear fringe extension **148**[1].

In Fig. 5 a number of stub card blanks are shown assembled in shingled fashion to form continuous form card stationary **122**. The assembly by heat and pressure at the lines of matching adhesive stripes within end strips **125** is the same as in the case of the web of Fig. 1.

While there have been shown and described and pointed out the fundamental novel features of the invention as applied to a preferred embodiment, it will be understood that various omissions and substitutions and changes in the form and details of the device illustrated and in its operation may be made by those skilled in the art, without departing from the spirit of the invention. It is the intention, therefore, to be limited only as indicated by the scope of the following claims.

What is claimed is:

1. A continuous form blank comprising a rectangular portion of card stock formed with slits, cutouts and perforations to define an interior break out tabulating card surrounded by side and end strips, said side strips being formed with regularly spaced pin feed perforations and extending tabs separated from said card by cutout slots but projecting within the side edges of the card and joined thereto between slits defining a tear line between card and strips, said end strips extending across the upper and lowers end of said card and said card being joined to said strips between slits, said end strips being separated from said card by a series of groups of perforations and slits tangential to the outer ones of said groups of perforations and cut thereto, said end strips being joined to the card by the card stock between the perforations of each group and separable from the side strips by slits in alignment with the slits between card sides and side strips, said end strips each bearing a stripe of colored adhesive which is narrower than the width of the strip and well within both edges thereof.

2. A blank as set forth in claim 1 wherein the adhesive stripe is on one face of one end strip and on the opposite face of the other strip, and said stripes extend out to the sides of said blank entirely across said side strips.

3. A blank as set forth in claim 1 with the upper left corner of said interior card formed with a bevel cut corner forming one border of a triangular opening resulting from the removal of a triangular piece of stock, the upper part of which extends into the upper end strip and is split by a slit, and the left part of which extends into the left side strip and is split by a cutout slot, whereby the removal of the triangular piece of stock leaves the card with a bevel edge with two sharply defined precut corners.

4. A web of continuous form stationery comprising a series of record material portions secured together shingle fashion, each portion containing a break out center piece constituting a standard sized tabulator card surrounded by end and marginal strips with preformed severing lines with some connections between said strips and said center piece, each shingle connection involving an overlap of a part of the top end strip of one portion by a part of the bottom end strip of an advance portion, said marginal strips being formed with pin feed perforations so spaced and related to print receiving lines on the cards that when said portions are secured together the pin feed perforations are evenly spaced on and between the series of joined portions, whereby the shingle connection is distinct from the end severing lines and does not interfere with a break out of the tabulator card as the center piece.

5. A continuous form portion comprising a rectangular piece of card stock formed with slots, cutouts, slits and perforations to outline an interior break out tabulating card with an adjoining stub card, said cards extending across the form portion laterally and completely surrounded by side and end strips, said side strips being formed with evenly spaced pin feed perforations, the left side strip being associated with the left side of the tabulating card and separated therefrom by cutout vertical slots but having inwardly extending tabs projecting within the left side edges of the card and joined therein

between slits defining an inner vertical tear line between card and strip, the right side strip being associated with the right side of the stub card and separated therefrom by a series of aligned vertical slits but joined by tear portions between said slits, said end strips extending across the upper and lower ends of said cards and separated therefrom by a series of grouped perforations and slits between said perforations, the last mentioned slits being horizontal and tangent to the outer periphery of the outer perforations of the groups and cut into said periphery, said end strips being joined to the cards by the card stock between the perforations of the groups, said end strips each bearing a horizontal stripe of colored adhesive which is narrower than the width of the strip, and a tear line between the cards comprising cutout vertical slots spaced between pairs of tabs extending from the stub card toward the tabulating card and projecting within the right side edges of the tabulating card and above and below a cutout triangle with two vertically facing points aligned with the small outer ends of the tabs to form a tear line.

6. A method for joining tabulating cards for recording thereon at accurately registered recording lines comprising the steps of forming a blank with lines of weakness to hold temporarily a tabulating card as a centralized break out element within end strips and side margin strips, punching regularly spaced pin feed perforations

in said margin strips, applying horizontal stripes of thermoplastic adhesive on the face of the top end strip and on the underside of the botton end strip, arranging a pair of such blanks in a shingled fashion with a bottom end strip overlapping a top end strip, registering the feed perforations of both blanks to be spaced the same at shingled joint as in the blanks, and applying heat and pressure on the shingled joint to connect the blanks.

References Cited in the file of this patent

UNITED STATES PATENTS

1,506,382	Pierce	Aug. 26, 1924
1,760,417	Lake	May 27, 1930
1,836,332	Muth	Dec. 15, 1931
2,260,601	Brenn	Oct. 28, 1941
2,300,255	Kerr	Oct. 27, 1942
2,482,613	Erickson	Sept. 20, 1949
2,521,435	Wockenfuss	Sept. 5, 1950
2,557,723	Brenn	June 19, 1951

FOREIGN PATENTS

464,177	Germany	Aug. 10, 1928
501,396	Great Britain	Feb. 27, 1939
563,106	Great Britain	July 28, 1944