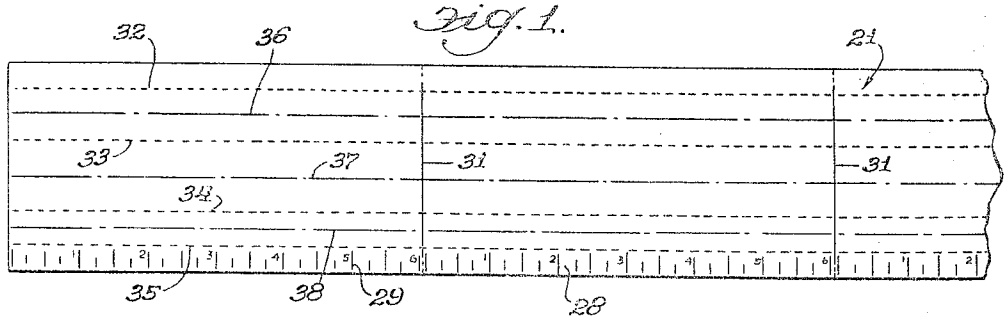
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Fig. 1.



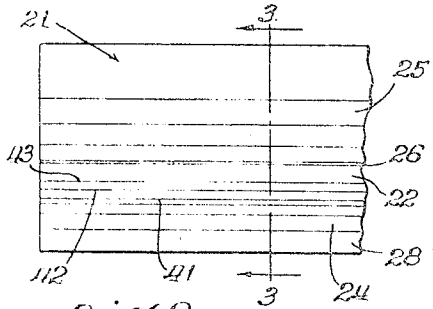


Fig. 2.

Fig. 3.

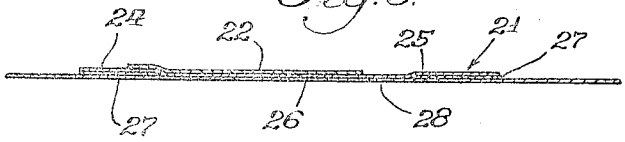


Fig. 4.

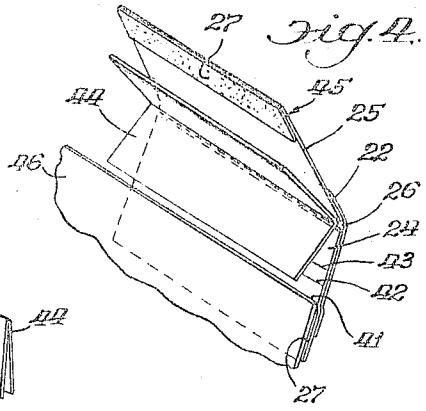
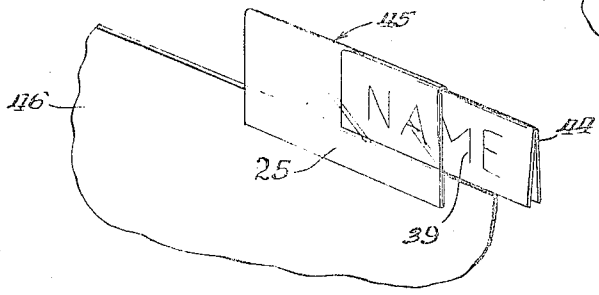


Fig. 5.



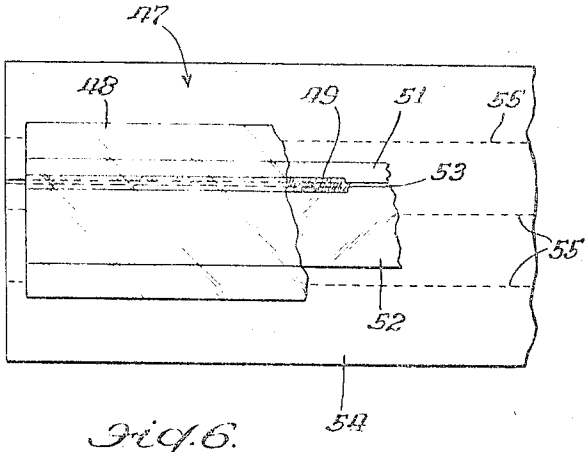
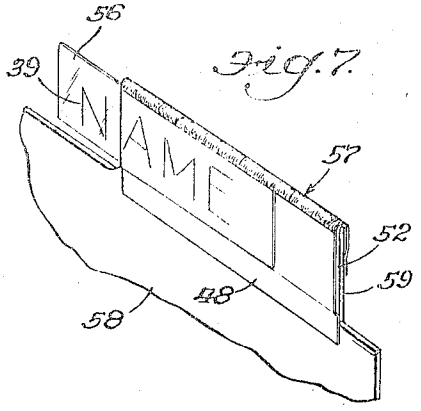


Fig. 6.

Fig. 7.



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Fig. 8.

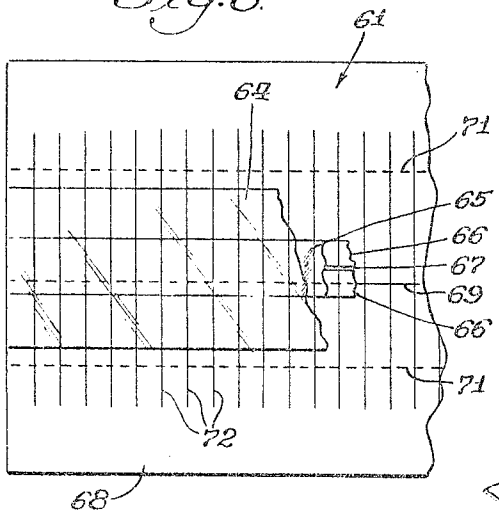
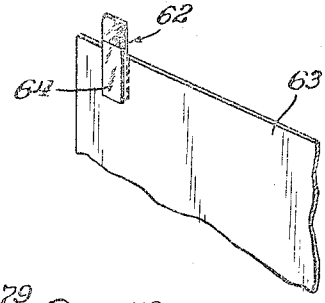


Fig. 9.



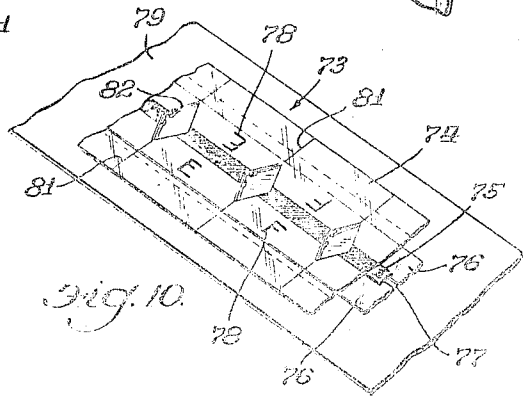


Fig. 10.

Fig. 13.

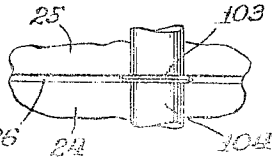
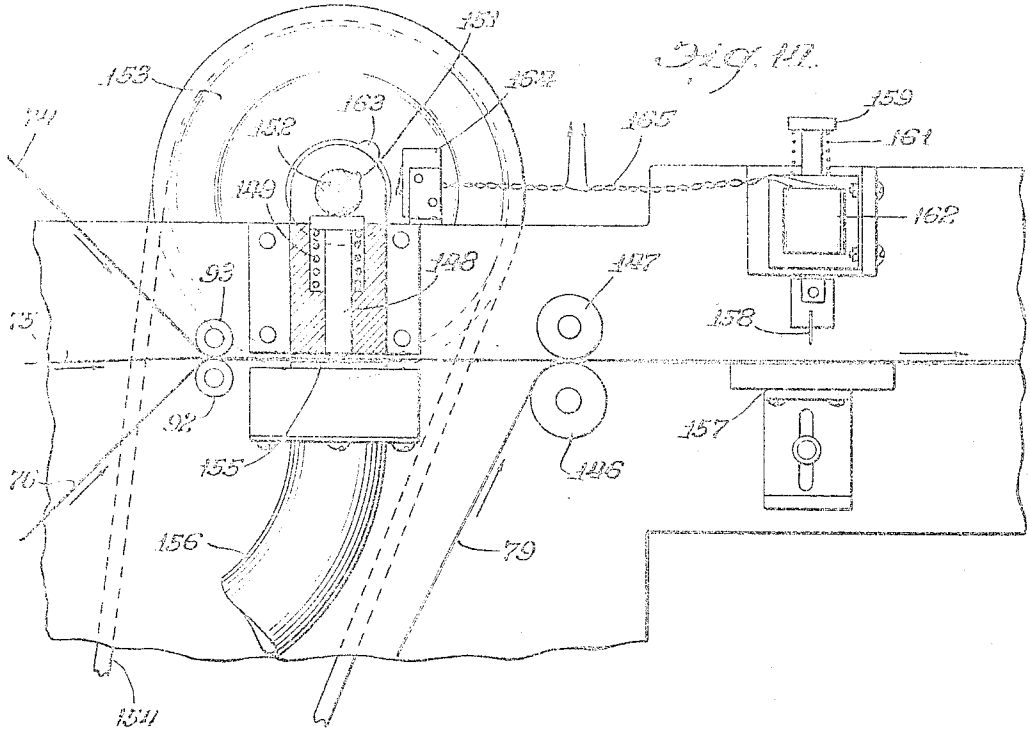


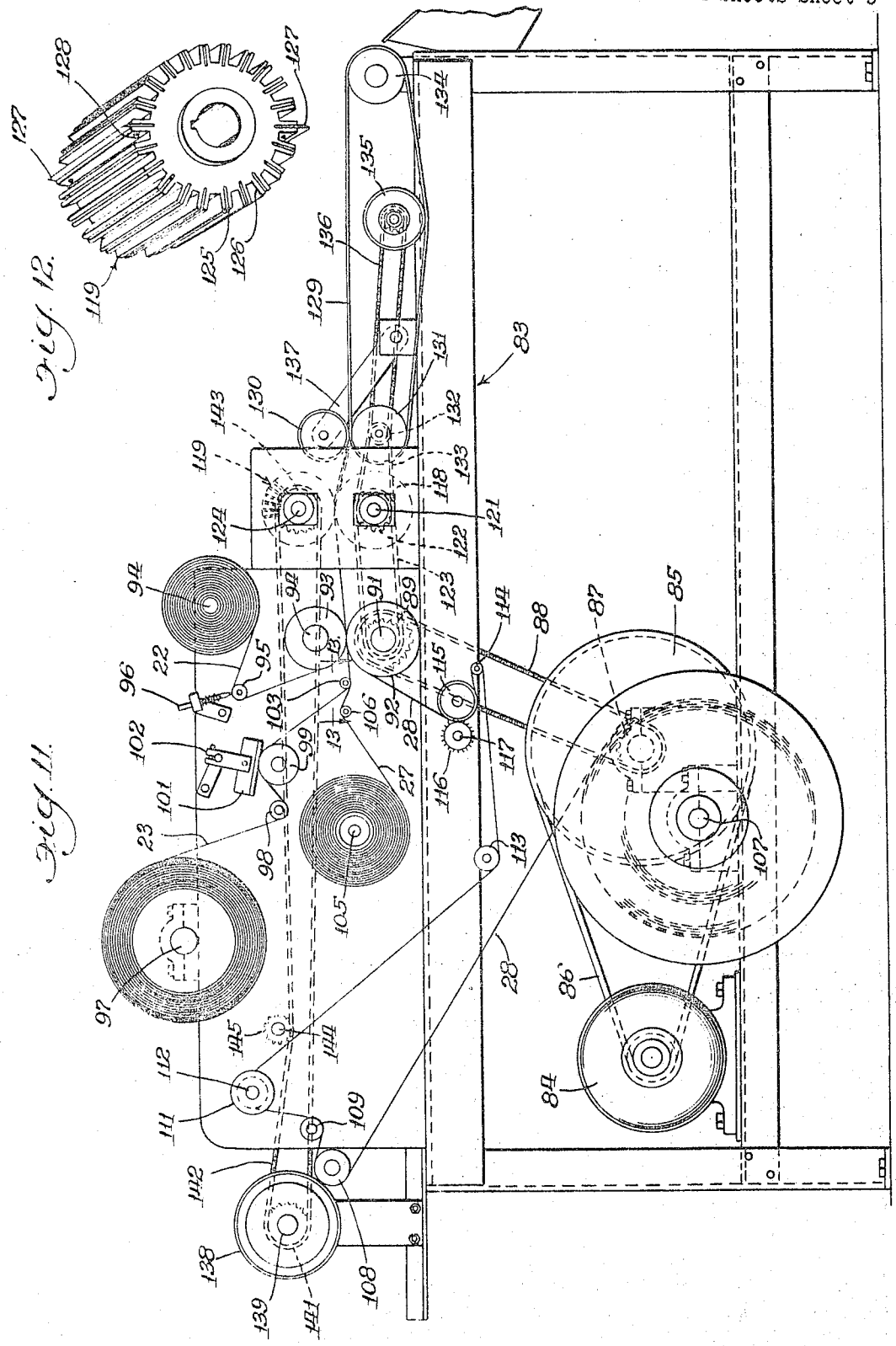
Fig. 12.



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Fig. 15.

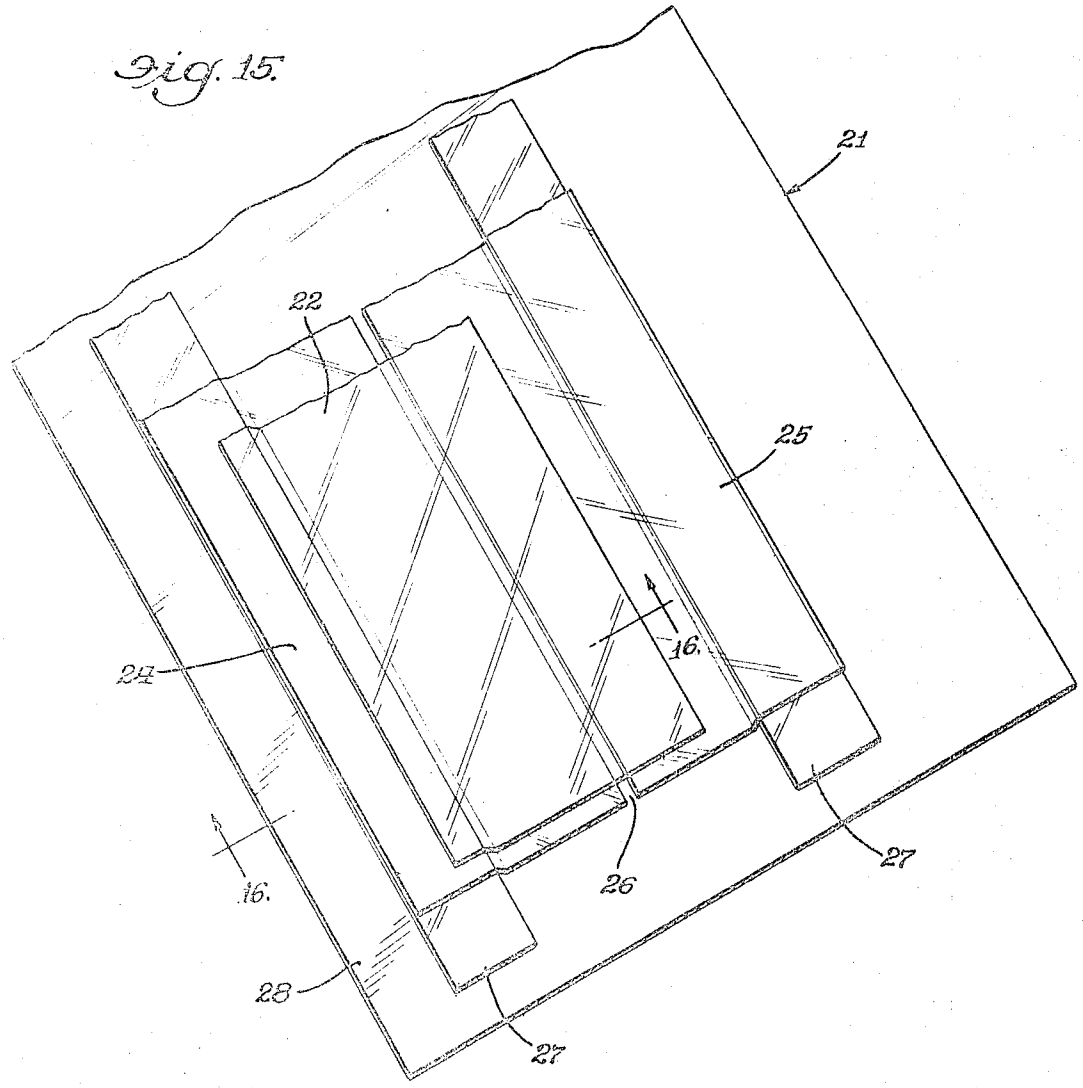
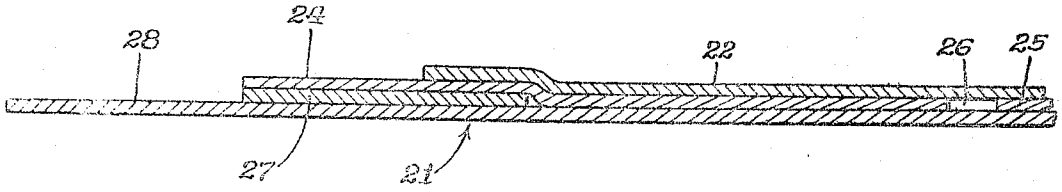


Fig. 16.



United States Patent Office 3,348,324 Patented Oct. 24, 1967

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Walter F. Cunningham, Chicago, Ill., assignor to Superior-Tabbies, Inc., Chicago, Ill., a corporation of Illinois

Original application Feb. 5, 1959, Ser. No. 791,462, now Patent No. 3,070,482, dated Dec. 25, 1962. Divided and this application May 3, 1962, Ser. No. 192,126

8 Claims. (Cl. 40—23)

This invention relates in general to index tabs, and more specifically to novel composite flexible strips providing improved separable tabs, the present application being a division of my co-pending application Ser. No. 791,462, filed Feb. 5, 1959, issued Dec. 25, 1962, as No. 3,070,482.

A principal object of the invention is the provision of a composite flexible strip comprising separable index tabs having transparent skirt or wing portions detachably secured by pressure-sensitive adhesive to a mounting strip, with the tabs including parallel filler strips spaced from each other to define a hinge portion, whereby folding of a tab along such hinge portion, after removal from the mounting strip, will bring the filler strips into face-to-face relationship and enable attachment of the skirt portions to an edge portion of a sheet of paper, or the like, to present an accurately positionable, strong, smooth and flexible tab which does not require moistening for its attachment.

Another object of the invention is to provide such a composite strip in which the mounting strip readily may be employed as an insert for the tab.

A further object is the provision of such a composite strip from which tabs of desired length readily may be severed.

Another object is to facilitate selectively variable positioning of the tab to cause the filler strips to define an insert-receiving pocket of desired height above the edge of the sheet to which the tab is attached.

A further object is the provision of such a tab construction which may be employed as a file folder tab protector.

Another object is to provide a new and simplified method for accurately mounting an index tab and an insert therefor at a selected position on the edge portion of a sheet of paper, or the like.

Other objects and advantages of the present improvements will be apparent from a consideration of the following specification wherein:

FIGURE 1 is a bottom plan view of a composite strip embodying the features of this invention;

FIG. 2 is a top plan view of an end portion of the composite strip of FIG. 1;

FIG. 3 is a transverse vertical section taken through the strip substantially on the line 3—3 of FIG. 2;

FIG. 4 is a perspective view of an indexing tab that has been severed from the strip of FIGS. 1–3 illustrating an intermediate step in the preferred method of attaching the same, with an insert, to the edge portion of a sheet of paper;

FIG. 5 is a view similar to FIG. 4 illustrating the index tab in its mounted position of use, with an insert partially removed therefrom;

FIG. 6 is a top plan view (similar to FIG. 2) of a portion of a modified composite strip, with various component strips thereof broken away at different points;

FIG. 7 is a perspective view showing a tab cut from the composite strip of FIG. 6 as applied as a file folder tab protector, with an insert shown in a position partially removed therefrom;

FIG. 8 is a top plan view similar to FIGS. 2 and 6 of a further modified form of composite strip;

FIG. 9 is a perspective view showing one of the color

indicating tabs removed from the strip of FIG. 8 and mounted for use on the edge portion of a sheet of paper;

FIG. 10 is a perspective view of a portion of another modified form of composite strip which provides a plurality of pre-printed index tabs;

FIG. 11 is a side elevation of a preferred form of apparatus for continuously making the composite strips of this invention;

FIG. 12 is a perspective view of a novel transverse cutter employed in the machine of FIG. 11;

FIG. 13 is a detail horizontal section taken substantially on the line 13—13 of FIG. 11;

FIG. 14 is a side elevation of a portion of a modified form of transverse cutting and punching mechanism that may be substituted for the cutter of FIG. 13 in the machine of FIG. 11;

FIG. 15 is an isometric view in exploded form with end portions of the various layers of the composite strip of FIGS. 1–3 separated and spaced vertically from each other; and

FIG. 16 is a transverse section like FIG. 3 of a portion of that composite strip greatly enlarged.

Referring more particularly to FIGURES 1 through 5, one form of index is therein disclosed which embodies the features of this invention. FIGURES 1, 2 and 3 illustrate that such index or a plurality thereof may be formed either as a single "blank" or a "blank" strip intended for sale in folded or rolled form and adapted to be cut transversely to provide index tabs of any selected length. FIGURE 1 illustrates the bottom or reverse side of this blank strip **21**, while the obverse side thereof is shown in FIGURE 2, which is that side that is exposed as the outer portion of the index tab in its final position of use, as in FIGURE 5.

The blank **21** is made up of four different plies. The first of these comprises a base member or backing strip **22** of a transparent polyester film, such as the Du Pont film marketed under the trademark "Mylar," which is provided with a suitable coating of clear, pressure-sensitive adhesive over its entire inner surface. This inner surface of the backing strip **22** is the lower surface thereof as seen in FIGURE 3. The second or next ply of the blank strip **21** comprises a transparent cellulose strip **23** (FIGURE 11), which is split longitudinally and separated (in a manner later to be described) to form two parallel filler members or strip portions **24** and **25** that are adhered to the inner or lower adhesive surface of the backing strip **22**, extend laterally therebeyond, and are spaced from each other to expose a narrow longitudinally extending portion **26** of the adhesive covered surface of the backing strip **22**. This portion **26** of the backing strip may be used for tab-retaining purposes, in a manner later to be described, and also comprises the hinge portion of the instant foldable index tab.

The third or next lower ply of the blank strip **21** comprises two marginal strips **27** having a suitable transparent and pressure-sensitive adhesive coating on both sides and adhered to the outer marginal portions of the cellulose strips **24** and **25** on their lower or inner surfaces. The fourth or lower ply of the blank strip **21** comprises a mounting strip **28** of a suitable polyethelene-impregnated release paper to which the lower or exposed surface of the marginal strips **27** are temporarily adhered and from which the same may readily be separated when a portion of the blank strip **21** is to be employed for index tabbing purposes.

As best seen in FIGURE 1, the lower or exposed surface of the mounting strip **28** preferably is provided along one marginal edge with a suitable scale **29** in inches and fractions thereof inscribed thereon in any desired manner. The blank strip **21** shown in FIGURE 1 is divided longitudinally into portions six inches in length by transverse

lines of severance **31** preferably cut entirely through the members **22–27** and through all but the exposed marginal portions of the mounting strip **28**, so as to render the blank **21** readily separable into portions six inches long. The scale **29** facilitates cutting these portions into separate tabs of selected length. As also best seen in FIGURE 1, the mounting strip **28** is perforated along parallel longitudinal lines **32, 33, 34,** and **35**. Intermediate adjacent ones of said lines of perforation, the mounting strip **28** is perforated in longer increments on longitudinal lines **36, 37** and **38**. In the modification herein illustrated in FIGURES 1–5, lines **32** and **33** are each spaced ¼ of an inch from the line **36**, the lines **33** and **34** are each spaced ½ of an inch from the line **37**, and the lines **34** and **35** are spaced, respectively, ⅛ of an inch from the line **38**. With such an arrangement, the mounting strip **28** may readily be severed along the lines **32, 33** to provide an index tab insert foldable on the line **36** to comprise a double walled insert ¼ of an inch in vertical height, as seen in FIGURE 5. Likewise, severing of the mounting strip along the lines **33** and **34** and folding such severed portion along the line **37** will provide a two walled tab insert ½ inch in height. An insert ⅛ inch in height similarly may be provided by severing the mounting strip **28** along the lines **34** and **35** and folding such severed portion along the line **38**.

It will be appreciated that the rear surface (upper surface in FIGURE 1) of the mounting strip **28** preferably will have typed or otherwise suitably inscribed thereon in the proper portion thereof such indicia as it is desired to expose in the final position of use. Such markings or inscriptions may easily be made on the mounting strip **28** before separation thereof from the marginal strips **27** or transverse severance of the blank strip **21**. It also will be understood that if the portion of the mounting strip **28** selected for use as the tab insert is folded along the associated line **36, 37** or **38**, indicia applied to the two portions thereof divided from each other by said lines must be inverted with respect to each other, in order for the same to be read properly from opposite sides of the index tab when in use. This will best be understood with reference to FIGURE 5 wherein reference numeral **39** designates such indicia inscribed on one exposed face of the tab insert, and it will be appreciated that the same indicia should be so inscribed on the reverse or other exposed surface of the insert as to be readable from the other side of the tab. Of course, when desired, indicia may be printed on the rear or lower surface of the mounting strip **28**. The construction illustrated in FIGURES 1–5, however, is that provided for custom indexing, including the application of desired indicia and forming of index tabs of any selected length.

In connection with the above-described arrangement enabling use of the mounting strip **28** for the index tab insert, the upper surface (as seen in FIGURES 2 and 3) of the cellulose strip portion **24** preferably has three colored lines **41, 42** and **43** inscribed thereon in longitudinally extending parallel relationship, with the outermost line **41** adjacent the inner edge of the associated marginal strip **27** and the spacing of the lines **42** and **43** therefrom being ⅛ of an inch and ¼ of an inch, respectively. Since the cellulose strip **24** is transparent, these guide lines **41–43** may be inscribed on either side thereof. Also, if desired, those lines may be inscribed on the under or inner side of the backing strip **22**, this arrangement being illustrated in its accomplishment in FIGURE 11.

In using the blank strip **21**, the user may sever the end portion thereof by tearing the perforated end extensions of the first line of severance **31**, and that end portion then may have the desired indicia inscribed on a selected part of the mounting strip **28**, either in script or by use of a typewriter. If it is desired to have the index tab insert ½ inch wide, the central portions between the lines of perforation **33** and **34** will be used. The thus inscribed portion of the blank strip **21** then is cut off to the proper length, and that part of the mounting strip **28** on which the indicia

are inscribed is separated along its marginal lines of perforation **33, 34** and folded along its central line **37** to form an indicia bearing member or insert which is designated in FIGURES 4 and 5 by reference numeral **44**.

At the same time or after such removal of the insert **44**, the remainder of the mounting strip **28** on the severed portion is removed and the resulting index tab, indicated generally in FIGURES 4 and 5 by reference numeral **45**, is placed on a supporting surface with the adhesive marginal strips **27** facing upwardly. The sheet **46** to which the index tab is to be attached then is pressed onto the adhesive strip **27** on the cellulose strip **24**, with the upper edge of the sheet extending along the outer guide line **41**. The insert **44** then may be positioned by pressing its central fold into contact with the central exposed portion **26** of the adhesive inner surface of the backing strip **22**, in the manner illustrated in FIGURE 4. The tab **45** then is folded over to present the filler strips **24, 25** in face-to-face relationship and the other adhesive strip **27** pressed against the upper surface of the sheet **46** to complete the mounting of the tab thereon. As shown in FIGURE 5, the insert **44**, although thus retained by the adhesive on the central hinge portion **26**, may readily be removed from the tab **45** and another insert substituted therefor. FIGURE 5 also illustrates the fact that the tab **45** may be mounted in the manner above described on the sheet **46** and the insert **44** thereafter slid into position between the two opposed cellulose strips **24, 25**. It will be appreciated that the spacing of the strips **24, 25** from each other to provide the exposed portion **26** is such as to be substantially equal to the double thickness of the insert **44** plus the thicknesses of the two adhesive strips **27**. As a result, that hinge portion **26** eliminates any bulkiness and permits the tab **45** to be attached smoothly to the sheet **46** as illustrated in FIGURE 5. Also, it will be appreciated that the insert **44** may be torn apart along its center line of perforations, which means that the desired indicia **39** may be typed on the mounting strip **28** without requiring reversal of the blank strip **21** in the typewriter. The optional use of the guide lines **42** or **43**, instead of line **41** as illustrated in FIGURE 4, will result in an insert-receiving space within the tab **45** ⅜ or ¼ of an inch, respectively, in height. When either of those heights are selected, it will be understood that the desired indicia **39** should be inscribed on the mounting strip **28** between the lines of perforation **32** and **33** or **34** and **35**, respectively. Regardless of the active height of the tab above the adjacent edge of the sheet **46** to which it is attached, the skirt portions thereof, which are those lower parts that are attached to the sheet **46**, will never interfere with any printed material, or the like, that may appear on the sheet **46** because of their being transparent.

This modification of FIGURES 1–5 thus comprises a blank strip from which index tabs of desired length may be cut as needed, and which includes a mounting strip, for maintaining the tab in usable condition until it is to be applied to a selected sheet, which also may be used as an indicia-receiving insert. Since no moistening is required to mount the tab because of its pressure-sensitive adhesive coated and transparent skirt or wing portions, it thus will be seen that a pen, pencil or typewriter is the only equipment needed, other than a pair of scissors if the selected length is less than the distance between the transverse lines **31**, in order to prepare and mount this novel index tab.

The modification of FIGURES 6 and 7 is intended for specific use as a file folder tab protector which also may be employed to mount an indicia-bearing insert. Like the modification of FIGURES 1–5, the blank strip designated in FIGURE 6 generally by reference numeral **47** comprises a four-ply structure. The first or uppermost ply in this figure is a base member or strip **48** of polyester film, such as "Mylar," which is substantially identical to the previously described strip **2** and, similarly, has its entire lower surface covered with a suitable transparent and

pressure-sensitive adhesive. The second ply comprises a narrow colored strip **49**, and the third ply comprises parallel filler members or strip portions **51** and **52**, spaced from each other at **53**, which are similar to the previously described strips **24** and **25** except that they are narrower than the backing strip **48**, so that marginal portions of the latter are exposed to provide adhesive covered skirt or wing sections which function in the same manner as the adhesive strips **27** previously described. The fourth ply of this blank strip **47** is a mounting strip **54** similar to the mounting strip **28**, being made of a suitable polyethylene-impregnated paper, except that it is perforated longitudinally on three parallel lines **55**. The middle one of these lines of perforation **55** extends along the center of this mounting strip **54** and the other two such lines are spaced therefrom slightly less than the width of the wider cellulose strip **52**. Thus, indicia **39** may be inscribed on the rear surface of the mounting strip **54** between these lines of perforation **55** and, after the strip **47** has been severed transversely, tearing of the mounting strip along the lines of perforation **55** will provide an indicia bearing member or insert **56**, as illustrated in FIGURE 7. The severed portion of the blank strip **47** when removed from the mounting strip **54** comprises a file folder tab protector **57**. This should be applied to a file folder **58** (FIGURE 7) by placing the tab on a supporting surface with its adhesive coated skirt or wing portions uppermost and placing the file folder on the skirt portion adjacent the narrowest strip **51**, using the colored strip **49** as a guide extending along the upper edge of the tab **59** of the file folder. The insert **56** then may be placed over the tab **59** and the protector **57** folded along the spacing or hinge portion **53** into its position of FIGURE 7. Or, if desired, the protector **57** may first be so folded and attached and the insert **56** subsequently slid into the pocket defined by the cellulose strip **52** and the file tab **59**.

As will be appreciated from the illustration in FIGURE 7, when the tab **57** is so mounted on the sheet or file folder **58**, the strip **49** provides a color indication visible from both sides of the tab. The width of the filler strip **52** is approximately equal to the height of the file folder tab **59**. Since this filler strip **52** is transparent, it will be understood that the tab **57** may be employed solely as a file folder tab protector without using the insert **56**. It also will be understood that this modification of FIGURES 6 and 7 may be made with the filler strips **52** of the same width and the spacing **53** slightly increased, so that an insert **56** may be mounted on each side of the tab **59** between it and the strips **51** and **52**, respectively. And it also will be appreciated that the modification of FIGURES1–5 likewise may be employed as a file folder tab protector.

The modification illustrated in FIGURE 8 also comprises a four-ply blank strip, which is designated generally by reference numeral **61**, but is so formed as to constitute a plurality of identical colored placement tabs, indicated generally by reference numeral **62**, that are readily separable therefrom and adapted to be mounted on a sheet **63** in the manner shown in FIGURE **9**. As in the preceding modifications, the uppermost ply of the strip **61** comprises a base member or backing strip **64** of a suitable polyester film, such as "Mylar," the under surface of which is coated throughout with a transparent and pressure-sensitive adhesive. Secured thereto is the second ply which comprises a colored strip **65** of any suitable material that has its lower surface coated with an adhesive. The third ply comprises a pair of filler members or strips **66** of any suitable material that are parallel to each other and spaced from each other at **65** to provide the same hinge construction previously described with respect to the other modifications. The fourth ply of the strip **61** comprises a mounting strip of the same material as the strips **28** and **54** but which is severed longitudinally along a line **69**, preferably somewhat off center. It is also perforated along longitudinal lines **71** that are spaced transversely a short distance outwardly from the marginal edges of the backing strip **64**. This blank strip **61** also is completely severed along parallel transverse lines **72** which extend laterally beyond the lines of perforation **71** and define the separate placement tabs **62**. With this construction, it will be appreciated that one or more of the tabs **62** readily may be removed, either with or without the associated portion of the mounting strip **68**, and after the latter has been peeled therefrom, the tab may be folded along its hinged portion **67** and secured to a sheet **63** in the manner illustrated in FIGURE 9.

The modification shown in FIGURE 10 also comprises a four-ply blank strip which is designated generally by the reference numeral **73**. As in the other modifications, the uppermost ply in the strip **73** comprises a base member or backing strip **74** substantially identical to the previously described strips **22**, **48** and **64** which, likewise, has its lower surface covered with a suitable pressure-sensitive and transparent adhesive. As in the modification of FIGURES 6 and 7, this blank strip **73** employs a narrow colored strip **75** as its second ply, but the latter is secured to the backing strip **74** along its longitudinal center line. The third ply of the strip **73** comprises a pair of filler members of cellulose strips **76** parallel to and spaced from each other to provide a hinge spacing **77** under the colored strip **75**. Either on the upper surfaces of these strips **76** or on the backing strip **74** are printed or otherwise inscribed a series of indicia, shown in FIGURE 10 as comprising the letters of the alphabet **78**. These are disposed in regularly spaced relationship longitudinally of the strip and in tumbled relationship relative to the center line thereof so that, when subsequently mounted for use, the indicia may be read properly from opposite sides of the resulting tab. Consequently, it will be appreciated that the filler strips **76** should be opaque so that the opposed indices **78** will not visually interfere with each other. As in the modifications of FIGURES 6–9, the backing strip **74** extends laterally of the strip **73** well beyond the outer margins of the parallel strips **76** to provide adhesive-coated skirt portions. It is these skirt portions which are adhered to the fourth ply of the blank strip **73** which comprises a mounting strip **79** similar to the previously described mounting strips but having no perforations therein.

At equally spaced distances longitudinally of the strip **73**, lines of severance **81** through the members **74**, **75** and **76** are provided which are parallel to each other and define the longitudinal edges of a series of pre-printed standard index tabs. Both to facilitate removal of these tabs from the mounting strip **79** for desired placement in similar fashion to the tab **62** shown in FIGURE 9 and to provide an index tab having its outer corners chamferred, the members **74**, **75** and **76** have diamond-shaped portions removed therefrom to provide apertures **82** disposed centrally of each transverse line of severance **81**. When mounted on the edge portion of a sheet of paper, or the like, each tab not only provides an index indication readily readable from each side of the sheet, but the strip **75** provides a color indication also visible from each side of the sheet.

The novel method of this invention for making the composite strips hereinbefore described comprises the steps of presenting a pair of parallel filler strips, which are in laterally spaced relationship relative to each other, to an intermediate strip and superposing thereon at a predetermined lineal speed a backing strip having its lower surface coated with pressure-sensitive adhesive, feeding a strip of release paper at such predetermined lineal speed and superposing the backing, filler and intermediate strips thereon, and severing the latter strips transversely for a distance less than the width of the release paper on lines spaced from each other a predetermined distance longitudinally of the strips. This provides a composite strip which is readily marketable in flat, folded or rolled form

from which tabs may easily be removed from the release paper and accurately applied to a selected sheet as strong, smooth and flexible tabs of minimum thickness. One of the most important steps in this method is that of maintaining the filler strips parallel and in properly spaced relationship, since the resulting hinge portion thus formed must be very accurately located in order to prevent bulging and misalignment of opposite edges when the tab is mounted in its position of use. This method of making the novel composite strip has the further advantage of enabling desired printing to be accomplished on selected portions of the strip, such as on either or both sides of the backing, filler or release paper strips, and in any desired form, including the scale **29**, directions on visually exposed portions of the obverse side of the mounting strip, the guide lines **41–43**, or the indices **78**. The method of making the composite strip of this invention also includes punching of such apertures as those designated by reference numeral **82** before the punched portion of the strip is presented to the mounting strip, which simplifies removal of those portions punched out to form the apertures.

In FIGURES 11, 12 and 13 one form of novel apparatus for carrying out the method of this invention is disclosed which may be used to make the different forms of composite strips contemplated. This apparatus is mounted upon and supported by a frame of any suitable construction which is designated generally by reference numeral **83**. Mounted in well known manner on a lower shelf portion of the frame **83** is a source of operating power in the form of an electric motor **84** which drives a fly wheel **85** through the agency of a belt **86**. The fly wheel **85** is secured to a drive shaft rotatably supported in any well known manner by the machine frame **83** and having a sprocket wheel **87** attached thereto. This wheel **87** drives a chain **88** which drives one portion of a double sprocket wheel **89** secured to a main drive shaft **91** suitably journalled in upstanding portions of the frame **83**.

The main drive shaft **91** also has a feed roller **92** mounted thereon for rotation therewith which comprises part of the drive means for moving the various strips longitudinally at a predetermined speed of travel. Cooperating with this feed roller **92** is a pressure roller **93** mounted on a horizontal shaft above the roller **92** in any suitable manner.

Mounted freely on a transverse shaft **94** is a roll of the polyester film strip **22** which is drawn over a guide pulley or flanged roller **95** by the driving action of the rolls **92, 93**. As shown in FIGURE 11, the guide lines **41–43** of the strip construction illustrated in FIGURES 1–5 may be inscribed upon a surface of the backing strip **22** by means of a plurality of inking members **96**, preferably in the form of ball point pens, which are mounted in a suitable bracket and spring-urged into inscribing engagement with the strip **22** as it passes over the guide pulley **95**. It will be understood that this pulley **95** is freely rotatably mounted in any suitable manner.

A roll of the cellulose, acetate base or other desired material forming the strip **23** is freely rotatably mounted adjacent the upper portion of the frame **83** by a shaft **97** carried in any suitable manner by the latter. The strip **23** is withdrawn from this roll under a guide pulley **98** similar to and mounted in the same manner as the guide pulley **95**. From the guide pulley or flanged roller **98** the strip **23** passes over a cylindrical platen **99** which is also freely rotatably mounted in any suitable manner on the frame **82**. A knife blade **101** extending longitudinally of the strip **23** is mounted by means of an adjustable bracket **102** above the platen **99** so as to sever the strip **23** longitudinally, as the same is drawn over the platen, into the previously described filler strips **24** and **25**. These strips **24, 25** are then carried under a guide and spacing means in the form of a thin wheel **103** which is freely rotatably mounted on the frame **83** in any suitable manner, the strips **24, 25** being moved thereunder at the same predetermined lineal speed as the backing strip **22** by the feed and pressure rolls **92, 93**. As best illustrated in FIGURE 13, it will be seen that the thin wheel **103** tapers inwardly from a centrally located peripheral edge to its base thickness which is equal to the spacing **26** desired to be maintained between the strips **24** and **25**. It is preferred that this wheel **103** be formed integrally with, or as a part of, a shaft **104** comprising a part of the guide and spacing means. The wheel **103** then should extend radially beyond the shaft **104** substantially only for the thickness of the strip **23**. With this arrangement, the wheel **103** will insure proper separation of the strips **24, 25** without interfering with any other strip or strips that likewise may be carried under the freely rotatable shaft **104** for integration with the strips **22, 24** and **25** by the rollers **92, 93**.

In this connection, one or more rolls of strips for the intermediate strips previously described are adapted to be freely rotatably mounted on a shaft **105** carried by the frame **83**. In FIGURE 11, the arrangement of the various rolls of strips illustrated is that employed in making the composite strip of FIGURES 1–3. Therefore, the rolls so mounted on the shaft **105** comprise two rolls of the adhesive-coated, laterally marginal, intermediate strips **27** spaced from each other (as shown in FIGURE 3) laterally by any suitable guide collars mounted on the shaft **105**. These strips **27** are drawn over a suitable guide roll **106**, which is freely rotatably mounted on the frame **83**, by the feed and pressure rolls **92, 93** for incorporation into the composite strip. A roll of release paper comprising the mounting strip **28** is freely rotatably mounted on a shaft **107** carried in any suitable manner by the lower portion of the frame **83**. This strip **28** is carried upwardly over a pressure roller **108** and under an idler roller **109**, both of which are mounted for free rotation on the frame **83** in any suitable manner. From there the strip **28** passes over a flanged roller **111** rotatably mounted on a shaft **112** carried by the frame **83** which, as will be explained hereafter, may be positionally interchanged with the pressure roller **108**. From the flanged guide roller **111**, the strip **28** passes under idler rolls **113** and **114** and under and around a cylindrical cutter platen **115**, all of which are freely rotatably mounted in suitable manner on the frame **83**. Cooperating with this platen **115** are one or more serrated perforating cutter wheels **116** which are freely rotatably mounted on a transverse shaft **117** and spaced thereon by suitable spacing collars to perforate the strip **28** longitudinally on the lines **32–38**, or **55** (FIGURE 6) or **71** (FIGURE 8). A similar but solid cutter wheel likewise may be mounted on this shaft **117** for severing the mounting strip **68** along the longitudinal line **69** when making the modification illustrated in FIG. 8. As in the case of the other component strips, the strip **28** is drawn along its guided path of travel from its roll by the driving means comprising the feed roller **92** and the pressure roller **93**. These latter rolls also function to adhesively secure the several component strips together to form the same into a composite strip.

As previously explained, the invention contemplates transversely severing such composite strip, preferably for a distance less than the full width of the mounting strip, on transverse lines that are spaced from each other longitudinally of the strip at predetermined intervals. One form of apparatus for accomplishing such transverse cutting is that illustrated in FIGURES 11 and 12, which comprises a cylindrical platen **118** and a slitter rotatably cooperating therewith and indicated generally by reference numeral **119**. As seen in FIGURE 11, the cylindrical platen **118** is mounted upon, and secured in any suitable manner to, a transverse shaft **121** journalled in the machine frame **83**. Also mounted upon, and secured against rotation relative to, the shaft **121** is a double sprocket

wheel 122, one portion of which engages and is driven by a chain 123 meshing with one portion of the double sprocket wheel 89.

The slitter 119 similarly is secured against rotation relative to, and mounted upon, a transverse shaft 124 journalled in the machine frame above the shaft 121. It is preferred that any well known manner of so rotatably mounting the shaft 124 be employed which may facilitate fine vertical adjustments thereof relative to the platen 118. Suitable gearing is interposed between the shafts 121 and 124, so that rotation of the former and the platen 118 from the main drive shaft 91 through the agency of the chain 123 will be imparted to the slitter 119. As best seen in FIGURE 12, this slitter 119 comprises a cylindrical body having a plurality of transversely extending and radially disposed guide slots 125 defined by parallel wall portions 126 and spaced from each other circumferentialy of the cylindrical roller. Each or any selected one or more of these slots 125 is adapted to slidably receive a knife blade 127 which may be retained in operative position therein in any suitable manner, as by means of set screws 128 extending through suitable tapped apertures in one of the associated side walls 126.

Suitable supplementary feed mechanism and discharge conveying means are provided which, as shown in FIGURE 11, may comprise a belt conveyor 129 and a pressure roller 130 cooperating therewith. A drive roller 131 for mounting the receiving end of the belt conveyor 129 is rotatably mounted in any suitable manner and has a double sprocket wheel 132 rigidly secured thereto which is driven by a chain 133 engaging one portion of the previously described double sprocket wheel 122. At its discharge end, the belt conveyor 129 is supported by an idler roller 134 rotatably mounted in any suitable manner, and the lower run of the belt is drivingly engaged by a take-up roller 135 which is driven from the double sprocket wheel 132 through the agency of a chain 136. Arms 137 at each side of the machine pivotally support the pressure roller 130 so that the weight of the latter insures driving contact of the composite and transversely slit strip with the belt conveyor 129.

It thus will be seen that the composite strip may have only certain component strips thereof transversely slit with such an arrangement, as on the lines 81 of the modification of FIG. 10, or it may be transversely cut completely through, but for a distance less than the full width of the mounting strip, as illustrated at 31 in FIGURE 1 and 72 in FIGURE 8. The lateral extent of the resulting slits will be determined by the effective length of the knife blade or blades 127. At the same time, the knife blade may be serrated radially of the slitter 119 adjacent its ends to accomplish the perforations in the composite strip illustrated at the ends of the lines of severance 31 in FIGURE 1. The guide slots 125 are spaced circumferentially to effect transverse slitting at minimum increments (as illustrated in FIGURE 8) when a knife blade 127 is mounted in each of them. In the embodiment herein shown, the circumference of the slitter 119 is substantially 12 inches, so that two diametrically opposed blades 127 are employed, as illustrated in FIGURE 12, for effecting transverse slitting of the composite strip on lines 31 (FIGURE 1) which are spaced 6 inches from each other. It will be readily understood that any desired intermediate spacing of the transversely extending slits may be effected by proper selection and positioning of knives 127 in the appropriate slots 125 of the slitter 119.

To effect any desired printing on the composite strip, in addition to the inscribing of the guide lines by the pens 96, a printing wheel or type carrying roller 138 may be employed in conjunction with the pressure roller 108 previously described. To this end, the wheel 138 is shown as removably secured to a transverse shaft 139 which is provided with a driving sprocket wheel 141 that is rotated by a chain 142 driven by a sprocket wheel 143 secured to the shaft 124. A splined shaft 144 similar to the shaft 139 is rotatably mounted in the machine frame and carries a sprocket wheel 145 which also is engaged and driven by the chain 142. The illustration in FIGURE 11 shows these parts mounted in such manner as to imprint desired indicia on selected portions of the upper or obverse surface of the mounting strip 28 which will be visually exposed after completion of the composite strip. If it is desired to imprint indicia on the lower or reverse side of the mounting strip, such as the scale 29 of FIGURE 1, it is only necessary to rearrange the printing mechanism just described as follows. The printing wheel 138 is slidably removed from its shaft 139 and placed on the splined end portion of the auxiliary shaft 144, and the pressure roller 108 and the flanged guide roller 111 are then interchanged positionally. The strip 28 then is threaded around the repositioned guide roller 111 under the idler roller 109 (as shown in FIGURE 11) and between the repositioned pressure roller 108 and printing wheel 138, the center line distance between the shafts 112 and 144 being the same as that between the shaft on which the pressure roller 108 is shown mounted in FIGURE 11 and the shaft 139. The under or reverse side of the strip 28 then will be in contact with the printing wheel 138.

The apparatus illustrated in FIGURE 14 comprises a modified form of mechanism intended to be substituted in the machine of FIGURE 11 for the slitter 119 and its immediately associated parts. To this end, the same is illustrated as being employed to make the composite strip shown in FIGURE 10. The backing strip 74 is brought between the fed roller 92 and pressure roller 93 in the same manner as the backing strip 22 shown in FIGURE 11. The narrow colored strip 75 and the filler strips 76 are drawn between the rollers 92, 93 in the manner illustrated in FIGURE 14. It will be appreciated that this may require slight repositioning or modification of the arrangement of the slitting mechanism 99–102 of FIGURE 11. The mounting strip 79 in the device of FIGURE 14 is not presented to the rollers 92, 93. Instead, a similar pair of feed and pressure rollers 146 and 147 are mounted in any suitable way in spaced relationship to the rolls 92, 93 and driven in similar manner to the latter.

Interposed between these two sets of rollers is a punching means comprising a vertically reciprocable punch 148 normally held in an elevated and inoperative position by a spring 149 against a cam 151 secured to a transverse shaft 152 that is rotatably mounted in any suitable manner in the machine frame. Drivingly secured to this shaft 152 is a pulley wheel 153 adapted to be driven by a belt 154 either from the pulley wheel 153 adapted to be driven by a belt 154 either from the pulley wheel 85, a modification thereof, or in any other suitable manner. The lower end of the punch 148, when depressed against the action of the spring 149 by the cam 151, cooperates with a die platen 155 to punch an aperture of selected configuration through the several strips 74–76 as the same are drawn over this die platen 155 by the feed and pressure rollers 146, 157. Secured to the under side of the die platen 155 is a suction exhaust pipe 156 which functions in well known manner to insure disposal of the blanks or aperture-defining portions cut from the strips 74–76 by this punching means.

After such aperatures, which are similar to those shown at 82 in FIG. 10, are so punched, the strips 74–76 are adhered to the mounting strip 79 by the feed and pressure rollers 146, 147, and the resulting composite strip is continued through the machine by such feed means as the pressure roller 130 and belt conveyor 129 previously described. Such movement of the composite strip carries it across an anvil 157 suitably mounted on the frame of the machine for vertical adjustment. Also mounted on the machine frame and above this anvil 157 is a transversely disposed slitter knife 158 carried on the bottom end of a solenoid plunger 159 that normally is held in a raised inoperative position by a spring 161. The solenoid 162 when energized causes a sharp downward movement of

the plunger **159** against the action of the spring **161** a predetermined distance, as limited by the head of the plunger. The anvil **157** thus may be adjusted to enable the knife **158** to slit through the strips **74–76** only, if desired, without cutting the mounting strip **79**. In order to actuate this slitter means in timed relationship to the operation of the punching means, a second cam **163** is mounted on the shaft **152** of the punching means which instantaneously closes a normally open switch **164** connected in the supply line **165** to the solenoid **162**. This results in instantaneous energization and substantially immediate deenergization of the solenoid in timed relationship to the operation of the punch **148**.

It is thought that the invention and many of its attendant advantages will be understood from the foregoing description and it will be apparent that various changes may be made in the form, construction, and arrangement of the parts of the article without departing from the spirit and scope of the invention or sacrificing all of its material advantages, the forms hereinbefore described being merely preferred embodiments thereof.

I claim:

1. A flexible composite strip providing separable tabs for attachment in use to the edge portion of a sheet of paper, comprising a transparent backing strip with a coating of pressure-sensitive adhesive on its lower surface, a pair of parallel filler strips adhered to said lower surface of said backing strip and spaced from each other a distance at least as great as the sum of their thicknesses to define a hinge portion extending longitudinally of said backing strip, said backing and filler strips together forming the body portion of said tabs and having transparent skirts wtih pressure-sensitive adhesive coating for attachment in use to opposed sides of the sheet of paper when said backing member is folded along said hinge portion to present said filler strips in opposed face-to-face relationship, and a planar mounting strip of release paper for carrying said backing and filler strips said skirts releasably attached thereto.

2. A flat and flexible composite strip providing separable index tabs of selected length for attachment in use to edge portions of sheets of paper, comprising a transparent backing strip of a polyester film with pressure-sensitive adhesive coating its lower surface, a pair of parallel filler strips attached to said lower surface of said backing strip and spaced apart laterally thereof a distance approximately equal to the sum of their thicknesses to define a hinge portion extending longitudinally of said backing strip, said backing and filler strips together forming the body portion of the index tabs and having pressure-sensitive adhesive coated marginal portions defining transparent skirts for attachment in use to opposed sides of a sheet of paper when folded along said hinge portion to present said filler strips in face-to-face relation, and a planar mounting strip of polyethylene-impregnated release paper for carrying said backing and filler strips with said skirts releasably secured thereto.

3. In a composite strip according to claim **1**, a colored strip interposed between said backing and filler strips to extend along said hinge portion and visually define the upper edge of the tabs in use.

4. A composite strip according to claim **1**, wherein said mounting strip is perforated longitudinally to facilitate removal of a selected portion thereof and its use as an insert for the tab.

5. A composite strip, according to claim **1**, wherein the width of at least one of said filler strips is approximately equal to the height of the tab of a file folder on which the tab may be mounted as a protector.

6. A composite strip according to claim **1**, wherein longitudinally extending parallel guide lines are provided adjacent one of said skirts which may be placed selectively along the edge of the sheet of paper to insure the formation of a pocket between said opposed filler strips of selected predetermined height above the edge of the sheet.

7. A composite strip according to claim **6**, wherein said mounting strip is provided with a plurality of longitudinal lines of perforation spaced from each other to provide detachable inserts of different heights corresponding to the heights of said pocket as determined by said guide lines.

8. A composite strip according to claim **2**, wherein said adhesive coated marginal portions comprise strips of transparent polyester film coated on both sides with transparent and pressure-sensitive adhesive.

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