

- [54] **PRESSURE SENSITIVE END SHEET FOR CASING BOOKS**
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- [22] **Filed: Sept. 12, 1971**
- [21] **Appl. No.: 179,967**

Related U.S. Application Data

- [63] Continuation-in-part of Ser. No. 146,648, May 25, 1971, which is a continuation-in-part of Ser. No. 79,086, Sept. 8, 1970.
- [52] U.S. Cl. 281/21, 281/29
- [51] Int. Cl. B42d 3/00
- [58] Field of Search 281/21, 29, 35-37;
11/3

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[57] **ABSTRACT**

An uncased book is provided with identical front and back end leaves each coated on most, but preferably not all, of its outward facing surface with pressure sensitive adhesive initially protected with release paper. The uncased book is positioned relative to the case, and the spine of the uncased book is preferably attached to the spine binding of the case. The release paper is stripped from the pressure sensitive adhesive, causing each end leaf to adhere to the inside of the facing cover of the case. In a preferred embodiment, the release paper is provided with a tab which extends back beyond the inside edge of the book so that it can be gripped and the release paper stripped while the cover is closed. The book itself may be fabricated in various ways and the end leaves may be attached to the uncased book in various ways. The manner of application of the pressure sensitive adhesive to the end leaves is also subjected to variation.

11 Claims, 18 Drawing Figures

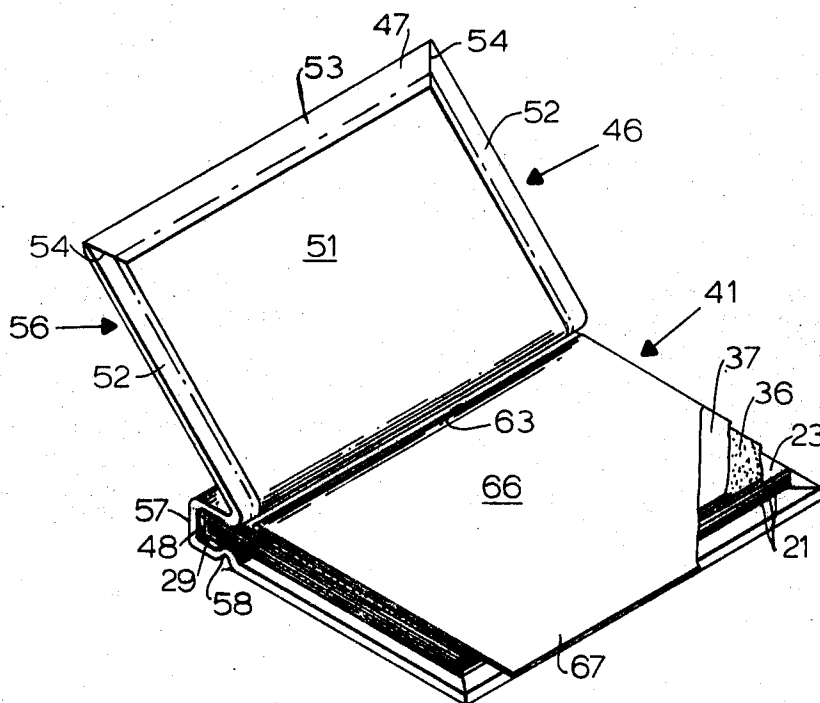


FIG. 1

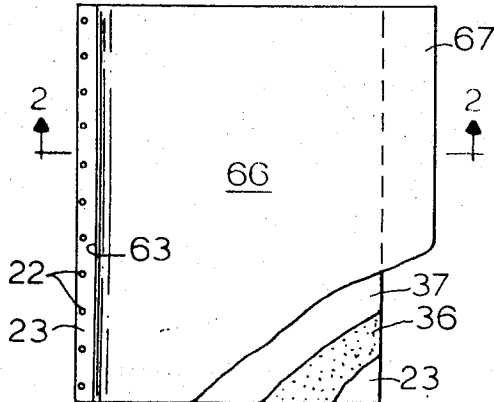


FIG. 2

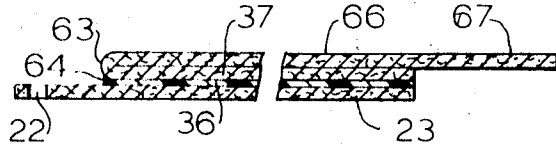


FIG. 3

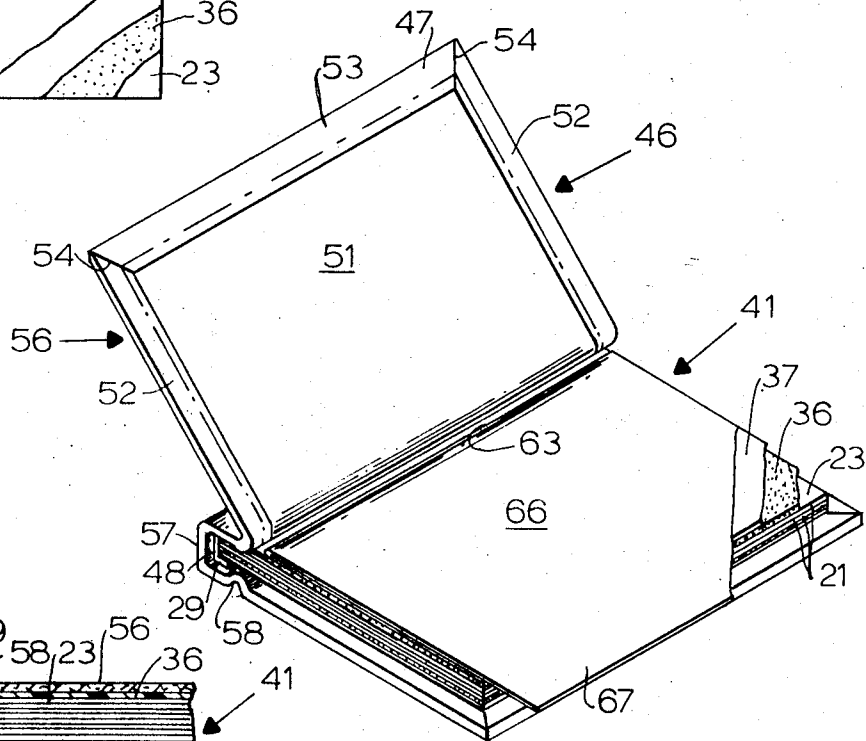


FIG. 4

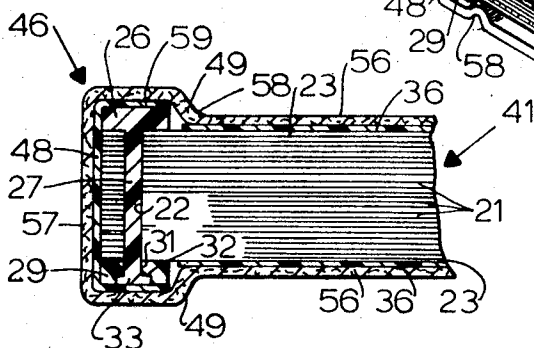


FIG. 5

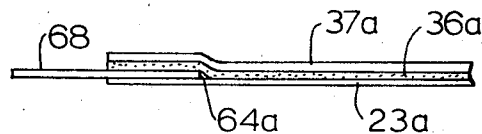
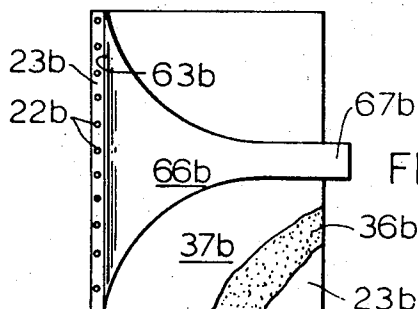


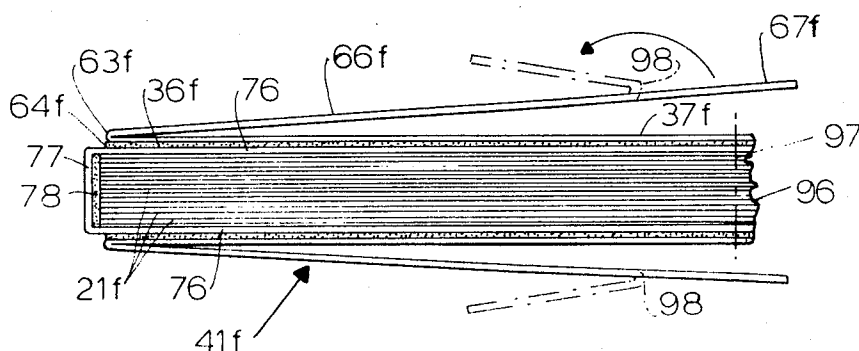
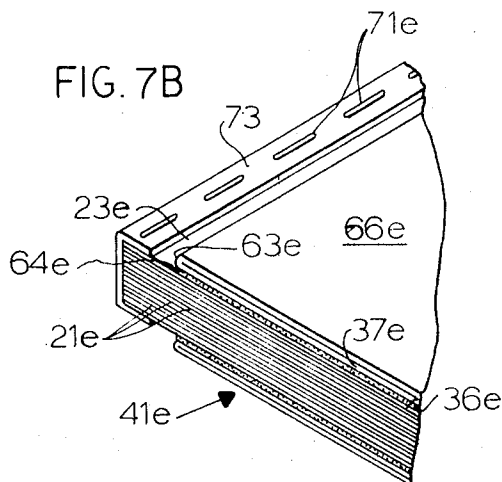
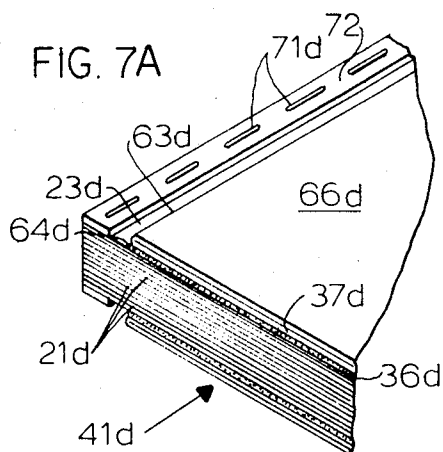
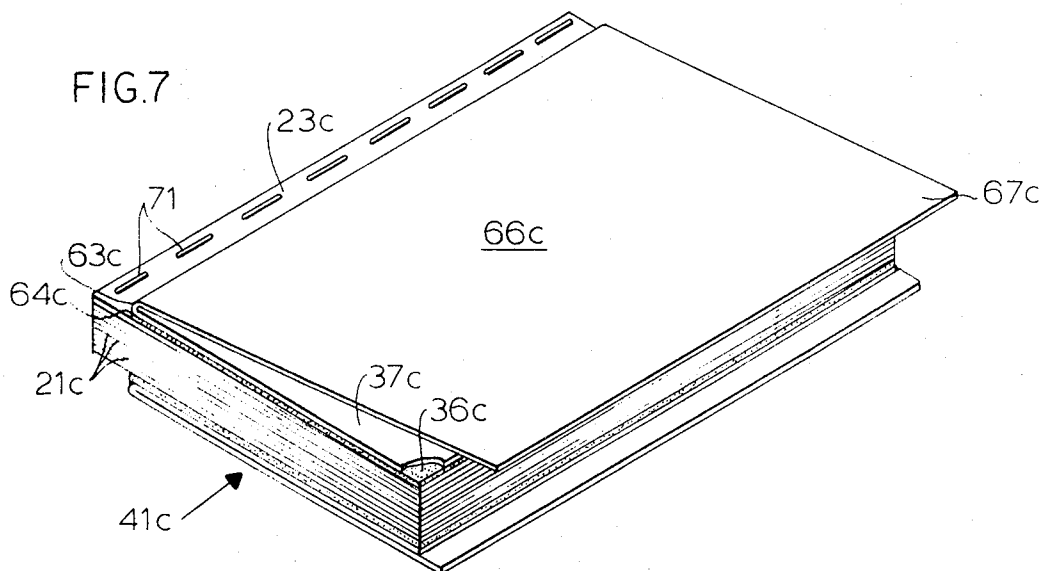
FIG. 6



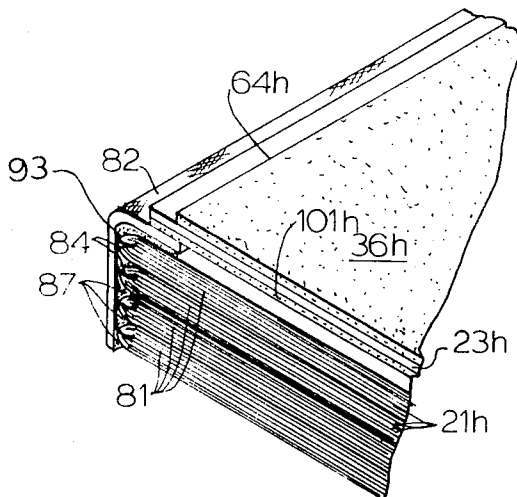
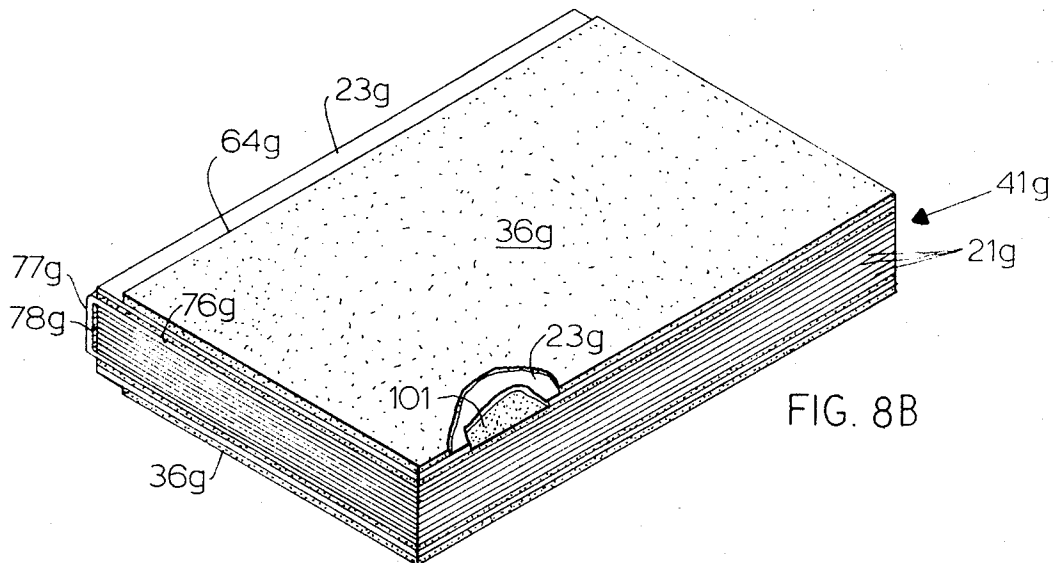
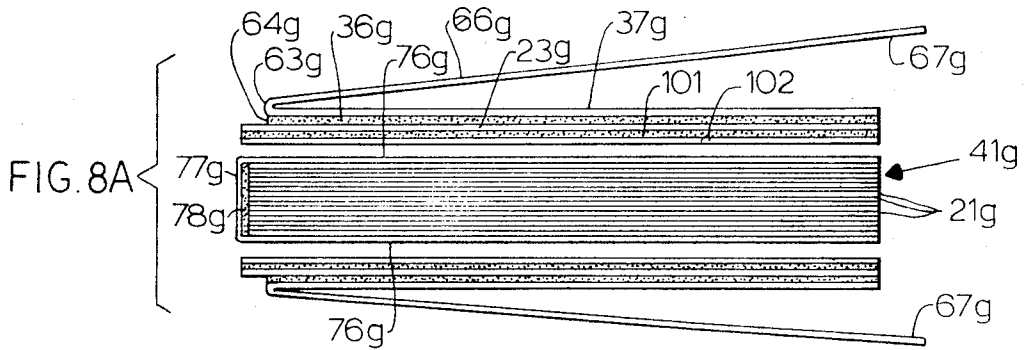
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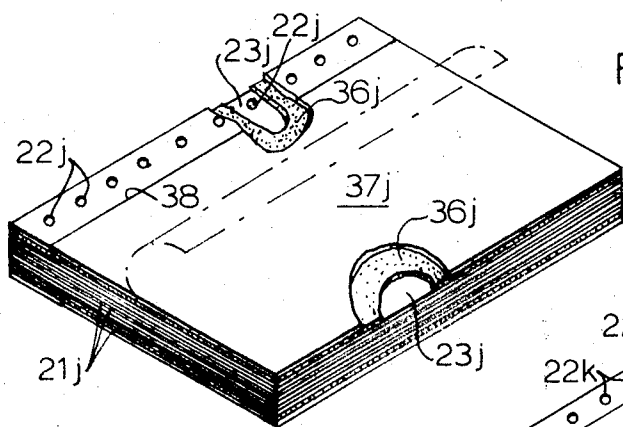


FIG. 10

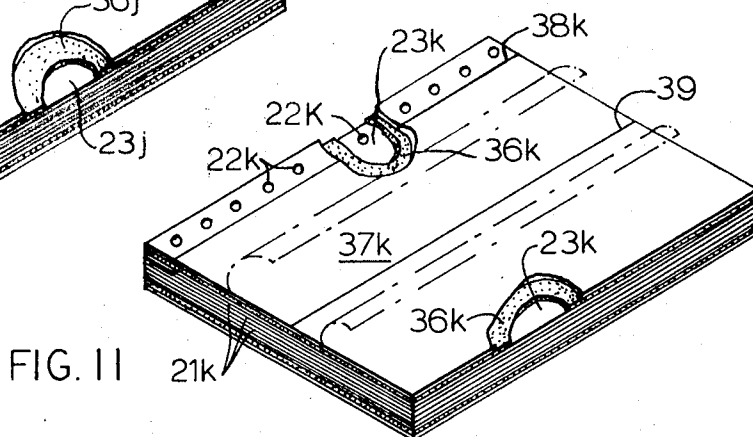


FIG. 11

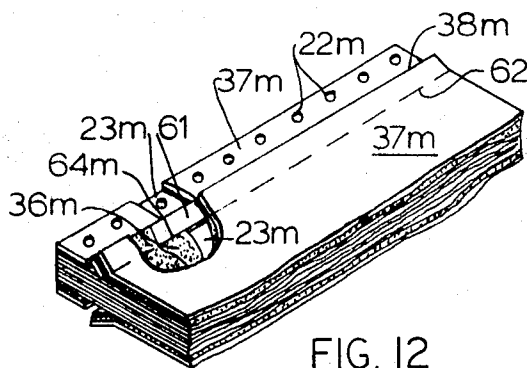


FIG. 12

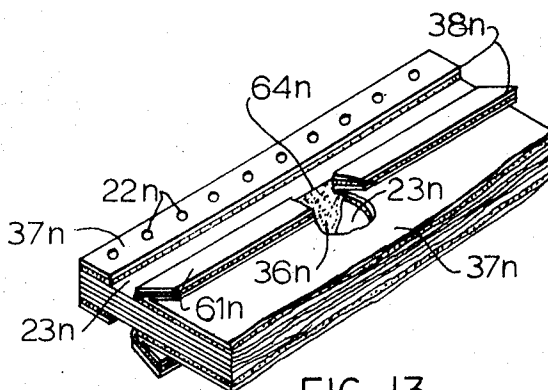


FIG. 13

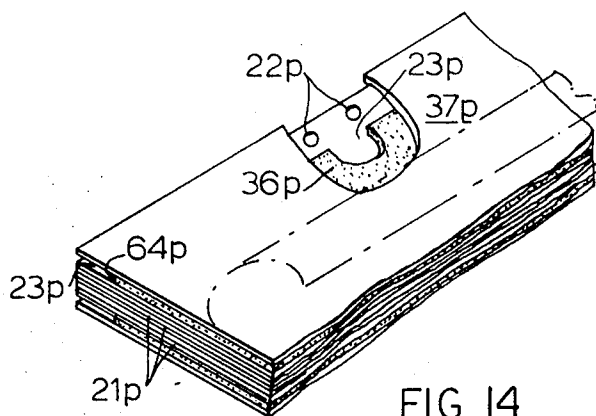


FIG. 14

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PRESSURE SENSITIVE END SHEET FOR CASING BOOKS

This invention is a continuation-in-part of application Ser. No. 146,648, filed May 25, 1971, which is in turn a continuation-in-part of Ser. No. 79,086, filed Sept. 8, 1970.

This invention relates to a new and improved pressure sensitive coated end leaf construction for uncased books wherein release paper initially protects the adhesive and wherein the release paper is fabricated so that it can be stripped off conveniently.

One of particular features of the invention is the fact that pressure sensitive adhesive is applied to each end leaf of the book. In accordance with conventional manufacturing practices, the pressure sensitive adhesive is first applied to release paper which has previously been coated so that when the adhesive is brought into contact with the end leaf, the adhesive sticks to the end leaf and does not stick well to the release paper. In other manufacturing practices, the adhesive may first be applied to the end leaf and release paper laminated thereto to protect the adhesive. When the release paper is stripped off, the pressure sensitive adhesive remains with the end leaf and is exposed. Features of the invention are the provision of various alternate constructions of the release paper so that it may be stripped or peeled off the end leaves in a convenient and efficient manner.

A further feature of the invention is that, after the spine edge of the uncased book has been caused to adhere to the spine of the case by any of various means, the end leaves are caused to adhere to the insides of the covers of the case by pressure sensitive adhesive.

Another feature of the invention is the fact that the release paper may be stripped with the uncased book attached to the spine of the case and the release paper stripped from the end leaves while the book is closed.

Another feature of the invention is the fact that likelihood of improper location of the end leaves relative to the case is for practical purposes eliminated.

It is accordingly, a principal advantage of the present invention that the attachment of the end leaves to the case is accomplished rapidly and conveniently.

Use of pressure sensitive adhesives is made feasible by the present invention and has numerous advantages. Pressure sensitive adhesive requires no curing, drying or hardening, as do animal and solvent glues used in binding. Presses are not required, a light rubbing effects total adhesion. There is no odor or mess and no cleanup is required.

Still another feature of the invention is that the end leaves may be used with uncased books of a variety of constructions. Some of these constructions are conventional, others are in accordance with pending applications of applicants. Among the conventional constructions are stapled and sewn uncased books. Further, the end leaves may be used with paperback books so that hard covers may be applied thereto.

Other objects of the present invention will become apparent upon reading the following specification and referring to the accompanying drawings in which similar characters of reference represent corresponding parts in each of the several views.

In the drawings:

FIG. 1 is a plan view, partly broken away, of an end leaf in accordance with the present invention.

FIG. 2 is an enlarged, fragmentary, sectional view taken substantially along the line 2-2 of FIG. 1.

FIG. 3 is a perspective view of a book in accordance with the present invention preparatory to an application of the end leaves to the front cover of the case, the view being partially broken away to reveal construction of the end leaf.

FIG. 4 is a fragmentary, sectional view through a portion of the book of FIG. 3 after the release paper has been removed and the end leaves have adhered to the insides of the covers.

FIG. 5 is a fragmentary, end elevational view of a modified end leaf.

FIG. 6 is a view similar to FIG. 1 of a still further modified end leaf.

FIG. 7 is a fragmentary perspective view of another modified form showing an end leaf stapled to an uncased book.

FIGS. 7A and 7B are modifications of FIG. 7.

FIG. 8 is an end elevation showing end leaves made in accordance with this invention applied to a paper bound book.

FIG. 8A is an exploded, somewhat schematic, end view of a modification of FIG. 8.

FIG. 8B is a perspective view, partially broken away, showing a book in accordance with FIG. 8A preliminary to being attached to a casing using pressure sensitive end leaves.

FIG. 9 is a view similar to FIG. 8A showing the invention applied to a sewn book.

FIGS. 10 - 14 are, respectively, perspective views, partially broken away, of still further modified end leaves.

One of the features of the present invention is the fact that the uncased book may be bound in various ways. The book shown in FIGS. 3 and 4 is prepared in accordance with U. S. Pat. application Ser. No. 799,045 filed Feb. 13, 1969, now U.S. Pat. No. 3,596,929 issued Sept. 8, 1971, and is further illustrated in said patent application Serial No. 146,648 filed May 25, 1971. Elsewhere in this application, there are illustrated somewhat schematically uncased books constructed by other means such as stapling, gluing, sewing, etc.

As shown in FIGS. 3 and 4, uncased book 41 is formed of a plurality of sheets 21 formed with apertures 22 adjacent the spine margins thereof. The uncased book is held together by means of a first plastic strip 26 having integral projecting thermoplastic studs 27 spaced to fit through the holes 22 and a second plastic strip 29 formed with similarly spaced holes 31 preferably having external counterbores 32 in which rivet heads 33 are formed on the severed ends of studs 27 by passing a hot knife through said studs spaced beyond said second strip and then moving the hot knife toward the second strip to form rivet-like heads 33 on said studs. Apparatus and method for thus fabricating a book are claimed in co-pending applications of the present applicants. End leaves 23 are provided which fit on the front and back of the stack of sheets 21, the spine marginal edges of the end leaves 23 being formed with apertures 22 and receiving the same studs 27 which secure the sheets 21 to the strips 26, 29.

One of the features of the present application is the use of pressure sensitive adhesive 36 on at least a portion of each end leaf 23. Initially, such adhesive 36 is protected from contact with other objects by release paper 37. Release paper 37, as conventionally manufactured, is ordinary Kraft paper which is coated with

polyethylene on both sides so that the paper does not absorb solvents or moisture and the polyethylene coating is stable. At least the side of the release paper to which the adhesive is applied is coated with a silicone material to facilitate stripping.

Adhesive 36 is usually an acrylic, cross-linked acrylic, nitrile rubber or other polymer which is initially dissolved in a solvent as commercially available. A coating between 4 and 6 mils thick is applied to the silicone coated surface of the release paper 37 and then the solvent is driven off by drying in an oven so that the adhesive layer 36 is about 1 mil or less in thickness. Such release paper 37 coated with adhesive 36 is then laminated to the end leaf 23 and rolled so that the adhesive 36 sticks to the end leaf 23. The fabrication of the end leaf 23, adhesive 36 and release paper 37 is an adaptation of general commercial practice in the pressure sensitive adhesive art. In accordance with the present invention, in the form of the invention shown in FIG. 3, by pulling the release paper 37 away from the adhesive 36 the adhesive 36 is exposed. When the front cover 56 of the case 46 is closed, adhesive 36 causes the end leaf 23 to adhere to the inside of the cover, as subsequently explained, and thus the case and cover are assembled.

The case 46 of the book is likewise subject to considerable variation. In the form shown in FIGS. 3 and 4, front and back covers 56 are connected by an integral central spine cover 57. It will be understood that the front and back covers 56 are usually fabricated with boards 51 of cardboard or similar material and that the top and bottom turnins 52 and outer edge turnin 53 only partially cover the boards and that the corners 54 are preferably mitered, in accordance with conventional case manufacturing operations. Thus, there is a hinge forming area 49 which is thin and flexible immediately toward the spine edge of the boards 51. This construction is shown partially in FIG. 3 but it is intentionally omitted in FIG. 4 so as to avoid confusing detail. In the form of case shown in FIG. 4, a resilient spine strip 48 is employed which is pressure sensitive on both surfaces and originally is provided with release paper (not shown) on its exposed surface, which release paper is stripped off prior to the assembly operation. Hinge creases 58 are formed immediately inward of covers 56 and beads 59 are formed immediately inward of the hinge creases 58. Details of such construction and the advantages thereof are shown in application Ser. No. 79,086 and application Ser. No. 146,648.

In assembling the uncased book 41 to case 46, the spine edge of the uncased book 41 is caused to adhere to the pressure sensitive resilient spine strip 48. As shown in FIG. 3, the front cover 56 (and the back cover as well), is unfinished in that the board 51 is shown merely covered by the turned in top and bottom turnins 52 and edge turnin 53. The ultimate position of the end leaf 23 which conceals the board 51 is shown in dot-and-dash lines in the inside of top cover 56.

After the spine of the uncased book is caused to adhere to the spine cover, the release paper 37 is removed, causing the adhesive 36 on the end leaf 23 to adhere to the inside of the board 51 and the portions of the turned in portions 52 and 53 within the dot-and-dash lines. The end leaf 23 thus permanently adheres to the cover 56.

In the modification shown in FIGS. 1-4, as best shown in FIG. 2, end leaf 23 is formed with holes 22 ad-

jacent its spine margin. Release paper 37 is initially coated with pressure sensitive adhesive 36 which terminates at longitudinal edge 64 adjacent but inward of holes 22. A crease 63 is formed in release paper 37 coinciding with the inner edge 64 of the pressure sensitive adhesive 36 and a layer of release paper 66 overlying the release paper 37 extends in an outward extension 67 beyond the inside edges of the end leaf 23, adhesive 36 and release paper 37. The completely fabricated end leaf is shown in FIGS. 1 and 2. Such an end leaf is attached to the uncased book. In the form shown in FIGS. 3 and 4, the studs 27 pass through the holes 22 in the end leaf 23 in the same manner as they pass through the holes 22 in the sheets 21. After the spine of the uncased book 41 has adhered to the spine 57 of the case 46, the covers 56 are closed and the extensions 67 project beyond the inside edges of the sheets 21 and front and back covers 56. These projections 67 may be pulled simultaneously or serially causing the release paper 37 to be gradually stripped back exposing the adhesive 36 which immediately adheres to the inside of the boards 51 and to the portions of the turnins 52, 53 which are inside the dot-and-dash lines of FIG. 3. Thus, the end leaves adhere to the case as shown in FIG. 4.

In the modification of FIG. 5, end leaf 23a is formed in the same manner as end leaf 23 or in other constructions. Release paper 37a is initially completely coated with pressure sensitive adhesive 36a. However, a second piece of paper 68 is attached by inserting the edge of the paper 68 overlying the spine margin of end leaf 23a before the pressure sensitive material 36a is laminated to end leaf 23a. Thus, the overlying portion 68 is connected to release paper 37a inwardly of the line 64a where the pressure sensitive material 36a ends on end leaf 23a. The portion 68 is folded over at a crease (not shown) approximately coinciding with line 64a to overlie the release paper 37a, thereby exposing an uncoated edge of the end leaf 23a for binding purposes. The portion 68 may be of extended width to provide an outward extension corresponding to extension 67.

In the modification of FIG. 6, which resembles that of FIG. 1, the overlying release paper is formed in a tongue 66b having an extension 67b, both of narrow height. Thus, the entire surface of release paper 37b is not covered by the tongue 66b. The shape of tongue 66b is subject to considerable variation from the curved shape shown in FIG. 6.

FIG. 7 illustrates an alternate means of binding the uncased book. In this form of the invention wire staples 71 of the type conventionally used in inexpensive book construction are used to secure the sheets 21c together and also to secure the end leaf 23c to the sheets 21c. Such an uncased book 41c is substituted for the uncased book 41 of FIG. 4. In other respects, the attachment of the case (not shown) thereto is similar to the preceding modifications. It will be noted that the end leaf 23c is provided with adhesive 36c and initially protected by release paper 37c which may be folded back at crease 63c, in the same manner as in FIG. 2, leaving a layer 66c.

In the modification of FIG. 7A, the structure is similar to FIG. 7 except that narrow longitudinal strips of reinforcing material 72 of cardboard or other suitable material are interposed over the outer edges of the end leaves 23d before staples 71d are applied and the staples passed through material 72 which may be card-

board, plastic or metal, with or without preformed holes through which staples 71d pass. In addition to preformed holes for staples, material 72 may be formed with depressions to receive staples 71d so that the staples do not protrude. Use of reinforcement 72 lessens likelihood of the sheets 21d tearing out of staples 71d. In the modification of FIG. 7B, a channel shaped reinforcement 73 of cardboard or other suitable material covers the spine edges of sheets 21e and 23e and also overlies the outer edges of end leaves 23e. Staples 71e thus pass through reinforcement 73 as well as sheets 21e.

FIG. 8 illustrates a paperback book 41f formed by the so-called "perfect binding" method wherein the front and back outer sheets 76 and the spine 77 are integral and the inside of the spine is glued to the spine edges of the sheets 21f by adhesive 78 in accordance with the present art. Initially such a paperback book has an uneven edge 96 which must be trimmed at trim line 97. The outward extension 67f of outer release paper layer 66f is folded back at fold 98 until the book is cut at trim line 97 (see dotted lines in FIG. 8) and then restored to full line position.

FIG. 8A illustrates a modification wherein end leaves 23g are attached by layers 101 of pressure sensitive adhesive to the front and back covers 76g of a paperback book 41g and the outside face of each end leaf 23g is similar to that of one of the preceding modifications. Initially, adhesive 101 is protected by release paper 102. The latter is removed and adhesive 101 bonds end leaf 23g to cover 76g. When release paper 37g is removed, layer 36g is exposed to attach uncased book 41g to a case (not shown), as illustrated in FIG. 8B.

Alternatively, instead of pressure sensitive adhesive 101, an end leaf similar to leaf 23g may be attached to cover 76 by conventional bookmaking glue, thermosetting adhesives or the like. This modification is not illustrated but its construction will readily occur to one skilled in the art.

FIG. 9 shows the invention applied to conventional sewn book signatures 81 consisting of folded large sheets forming individual pages 21h after being trimmed on three sides. The outer signatures 81 may be connected to a gauze spine strip 82 which overlies the spine marginal edges of the outermost signatures in various ways. As shown, the inner edge 83 of each signature 81 is tipped with adhesive 87. Further, threads 84 sew the longitudinal creases of the signatures 81 to each other and may also secure them to gauze 82. This is a conventional bookmaking construction. Adhesive 36h is applied to the outer face of end leaf 23h up to line 64h and protected with release paper (not shown) as in previous modifications. In the modifications shown in FIG. 9, adhesive 101h on the inside of end leaf 23h attaches the latter to gauze 82 and the outermost sheet 21h of outermost signature 81. Alternatively, end leaf 23h may be tipped with glue and bonded to the outermost signature by thread, with or without inner layer 101h of adhesive. In other respects the end leaves may have pressure-sensitive adhesive and be protected initially by release paper as in the preceding modifications.

FIG. 10 shows an end leaf wherein release paper 37j is substantially the same dimension as end leaf 23j and is not folded back as in previous modifications. To facilitate stripping the release paper a slit 38 formed in the release paper slightly outward of the location of

whatever binding means is used to attach the end leaf to the uncased book, line 38 being parallel to the side edges of the leaf. A corner of the release paper may be folded back outward of line 38 to further facilitate stripping.

FIG. 11 shows a structure similar to FIG. 10 except that a second slit 39 is formed in release paper 37k about one-half the width of end leaf 23k. Thus release paper 37k is removed in two stages: first by peeling back from slit 38k and then by peeling back from slit 39.

In the modification of FIG. 12, a narrow ribbon 61 of paper is placed on the underside of adhesive-coated release paper 37m prior to laminating to end leaf 23m. After lamination, slit 38m is located to coincide with the spine side of ribbon 61. Ribbon 61 prevents adherence of adhesive coated release paper 37m and end leaf 23m in an area outward of line 62 which extends from top to bottom of paper 37m. In the use of this modification it is relatively simple for the operator to peel back the release paper 37m because there is a narrow area adjacent slit 38m where the release paper 37m is loose.

The form of the invention shown in FIG. 13 is a further modification in which release paper 37n is folded back so that the free surface of ribbon 61n is uppermost, making it even easier to peel off the end paper 37n.

Directing attention to FIG. 14, the adhesive 36p is applied only partially over the width of release paper 37p but terminates in the line 64p spaced inward from the left-hand margin of paper 23p. When release paper 37p is peeled back, the edge 64p of adhesive 36p is spaced to the right of the left-hand margin of the end leaf 23p a predetermined distance.

The structures of FIGS. 5, 6, 7, 7A, 7B, 8, 8A, and 9-14 are in many respects similar to the modification of FIGS. 1-4 and the same reference numerals followed by the subscripts a, b, c, d, e, f, g, h, j, k, m, n and p, respectively, are used to designate corresponding parts in the several views.

What is claimed is:

1. An end leaf structure for a book comprising an end leaf dimensioned approximately the same as the sheets of said book and having a spine edge and an outer edge, a layer of pressure-sensitive adhesive covering substantially the entire end leaf, said adhesive terminating at a line parallel to and spaced inward of the spine edge of said end leaf, and a release paper protecting said adhesive and covering all of said adhesive, said release paper folded at about said line of said adhesive to define an underneath layer covering said adhesive and terminating at said outer edge and a top layer extending outward beyond said outer edge of said end leaf to provide a tab to pull said release paper away from said adhesive, the portion of said end leaf between said line and said spine edge comprising attachment means for attachment of said leaf to an uncased book.

2. An end leaf according to claim 1 which further comprises a second layer of pressure-sensitive adhesive on the side of said end leaf opposite said first-mentioned layer and second release paper protecting said second layer, said second release paper removable for attachment of said end leaf to the outer surface of an uncased book by means of said second layer.

3. An end leaf structure according to claim 1 in which said tab is narrower than said end leaf.

4. An end leaf structure according to claim 1 in which said release paper comprises two separate parts, an underneath part initially dimensioned the same as said end leaf and a top part having an inner edge along said line and having second adhesive adhering said top part to the portion of said underneath adhering part which extends from said line to said spine edge, said underneath part being folded at said line with said top portion extending overlying said underneath part to form an outward extension beyond said outer edge.

5. In combination, an end leaf according to claim 1, an uncased book and binding means cooperable with said attachment mean for binding said end leaf to said uncased book.

6. In combination, an end leaf according to claim 1, an uncased "paperbound" book having integral front, back, and spine covers, sheets, and second adhesive attaching the spine edges and which further comprises third adhesive on the side of said end leaf opposite said first-mentioned adhesive attaching said end leaf to the outside of said front cover.

7. The combination of claim 6 in which said binding means comprises a plurality of metal staples.

8. The combination of claim 7 which further comprises a reinforcement underlying said staples.

9. The combination of claim 8 in which said reinforcement covers the spine edge of said uncased book and both edges of said book adjacent the spine edge thereof.

10. An end leaf structure according to claim 1 in which said release paper comprises two separate parts, an underneath part initially dimensioned the same as said end leaf and a ribbon having an inner edge along said line and having second adhesive adhering said ribbon to the portion of said underneath part which extends from said line to said spine edge, said underneath part being folded at said line, said ribbon forming said tab.

11. An end leaf according to claim 10 in which said release paper is folded over at the inner edge of said ribbon, said ribbon being exposed.

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