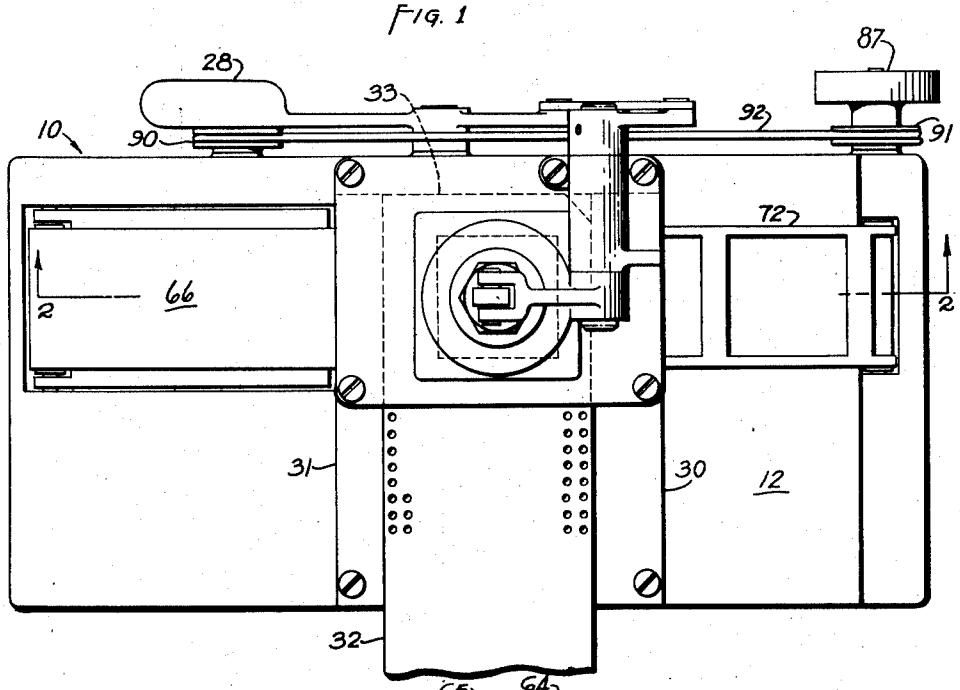
Feb. 3, 1953 R. CONNOR ET AL 2,627,212

APPARATUS AND METHOD OF CUTTING ADHESIVE MATERIAL AND MOUNTING THE SAME UPON A CARD

Filed Dec. 28, 1948 2 SHEETS—SHEET 1

FIG. 1



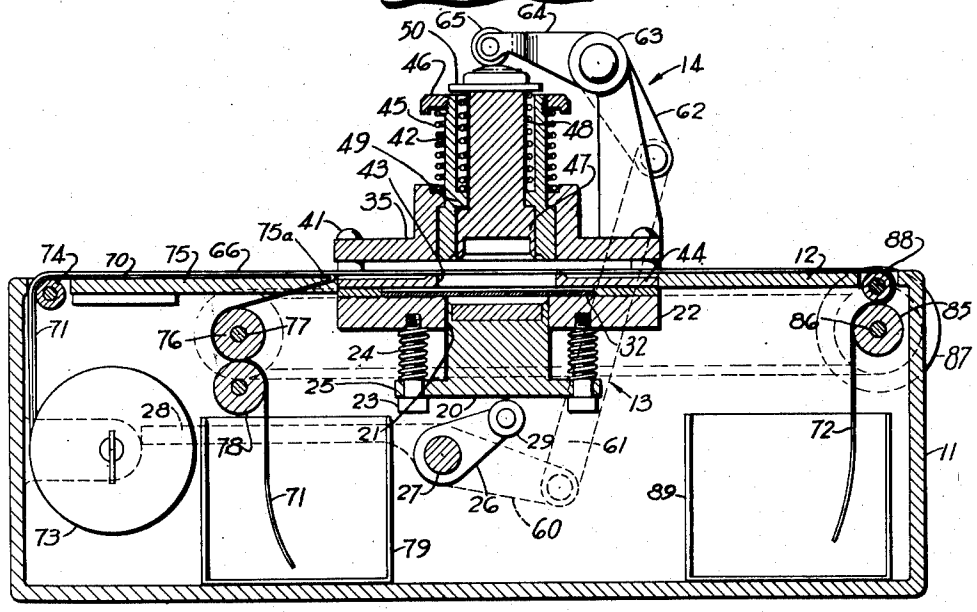


FIG. 2

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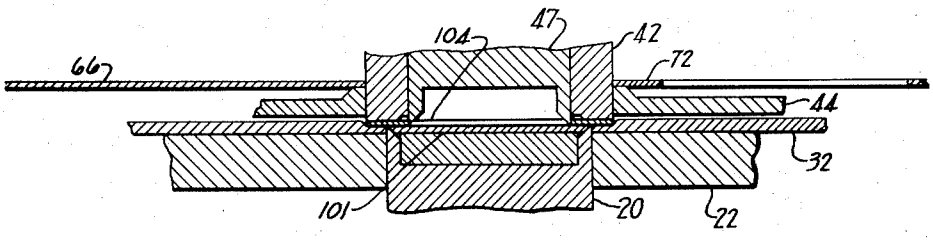

FIG. 3

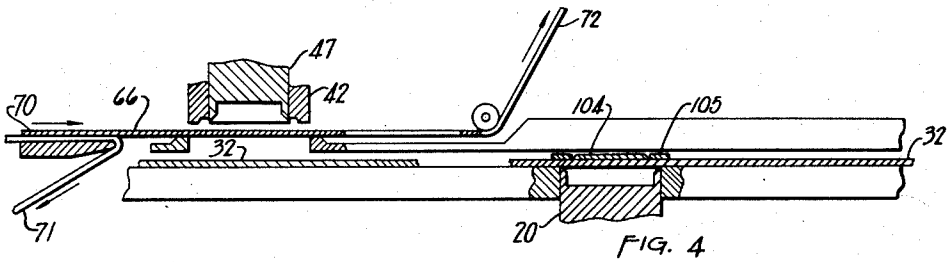

FIG. 4

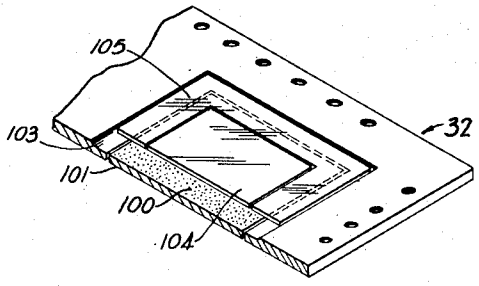

FIG. 6

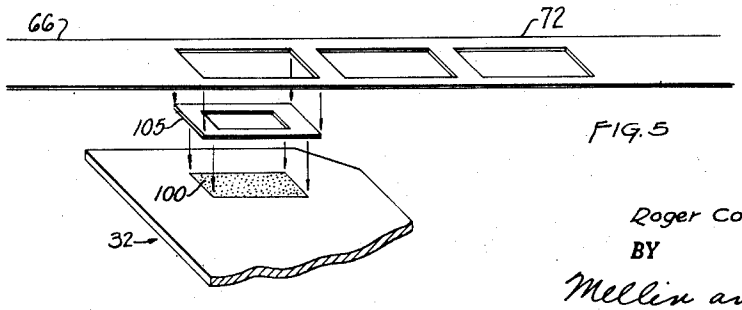

FIG. 5

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2,627,212

APPARATUS AND METHOD OF CUTTING ADHESIVE MATERIAL AND MOUNTING THE SAME UPON A CARD

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16 Claims. (Cl. 93—1)

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This invention relates to apparatus and method for cutting frames of adhesive-coated transparent material and mounting the frames upon a card, and it also relates to the article so produced.

In statistical work and the utilization of statistical records, it is frequently desirable to provide a statistical card, such as a marginally perforated card of the variety as "Keysort," with a microfilm exposure having thereon information relevant to the card. It is an established practice, therefore, to provide statistical cards of the character referred to with die-cut rectangular openings, and to mount microfilm exposures within the die-cut openings in the following manner: Each die-cut card is provided with a rectangular frame of transparent adhesive-coated material, such as glassine coated on one side with a pressure-sensitive adhesive. The frame overlaps the edges of the die-cut opening, and it is mounted on the card with the adhesive side facing the card. An individual microfilm exposure is mounted on the reverse side of the card within the die-cut opening, being adhesively secured to the inwardly projecting portions of the glassine frame.

In providing such an article, the practice heretofore has involved a plurality of separate operations carried out at different times and places, and thus involving a plurality of machines.

It is an object of the present invention to provide a single machine which is capable of forming a die-cut opening in a statistical card and cutting and mounting a frame of adhesive-coated material on the card in registry with the die-cut opening in a single operation or in very few operations carried out more or less simultaneously.

It is a further object of the invention to provide a simplified, better organized procedure for producing articles of the nature described.

It is a still further object of the invention to provide a novel and useful semi-finished article which lends itself to storage and shipment and which is at any time readily converted to a finished article of the nature described.

These and other objects of the invention will be apparent from the ensuing description and the appended claims.

One form which the invention may assume is exemplified in the following description and illustrated by way of example in the accompanying drawings, in which:

Fig. 1 is a top-plan view of the machine.

Fig. 2 is a vertical section taken along the line 2—2 of Fig. 1.

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Fig. 3 is a fragmentary view of the dies employed in the apparatus, showing them in closed position.

Fig. 4 is a fragmentary view of the dies employed in a modified form of the apparatus and showing the dies in open position.

Fig. 5 is a diagrammatic view showing the manner in which the final article is formed.

Fig. 6 is a fragmentary sectional view, showing the article produced.

Referring now to the drawings, and more particularly to Figs. 1 and 2, there is shown an apparatus generally designated as 10 comprising a framework or housing 11 having a cover plate 12. Disposed within the housing is a card cutting mechanism generally designated as 13 and disposed above the housing is a frame cutting mechanism generally designated as 14.

The card cutting mechanism 13 comprises a die 20, which is reciprocable within a die opening 21 formed in a bed plate or die plate 22. The die 20 is slidably supported upon studs 23 and is normally held in its lowermost, inactive position, as shown in Fig. 2, by means of coil springs 24 compressed between the die plate 22 and a flange 25 formed on the die. The die 20 is operated by means of an arm 26 fixed to a shaft 27 which is operated by means of a lever 28. A roller 29 is rotatably mounted on the end of the arm 26 and, as will be apparent, upon depressing the lever 28 the arm 26 will be rotated counterclockwise as viewed in Fig. 2, thus moving the die 20 upwardly, and upon release of the lever 28, the coil spring 24 will operate to return the die to its lowermost, inactive position. Guide plates 30 and 31 are secured to the cover plate 12 to guide a statistical card 32 and an end plate or stop member 33 is provided such that, when the statistical card is placed between the lateral guide plates 30 and 31 and is pushed inwardly until it abuts the end plate or stop member 33, a predetermined portion of the card will overly and be in precise registry with the lower die 20.

The frame cutting and mounting mechanism 14 comprises a housing 35 bolted to the framework by means of screws 41. Slidable vertically within the housing 35 is an outer die 42 which is in precise registry with a die opening 43 formed in a die plate 44. The outer die 42 is normally held in upward, inactive position by means of a coil spring 45 which is compressed between the housing 35 and a nut 46 in threaded engagement with the upper end of the die 42, the nut 46 serving also to regulate the compression of the coil spring 45. Slidably disposed within the outer

die 42 is an inner die 47 which is normally held in uppermost position relative to the outer die, by means of a coil spring 48 compressed between a flange 49 formed on the interior of the outer die 42 and a cap or flange 50 formed on the inner die.

The inner die 47 and the outer die 42 are actuated by the same lever 28, which serves to actuate the lower die 20, through the medium of a lever 60 secured to the shaft 27, a link 61 and a lever 62 secured at one end to the link 61 and at its other end to a rotatable stud 63 to the other end of which is secured a lever 64 having a roller 65 rotatably mounted at its free end. It will thus be seen that, when the lever 28 is depressed, the lower die 20 will be elevated and will form a single, rectangular cut in a statistical card 32 and that the inner and outer dies 47 and 42 will move downwardly to form inner and outer rectangular cuts on a strip 66 of adhesive-coated glassine. The purpose of these cutting operations and the order in which they are performed will appear more clearly hereinafter.

The machine is also provided with means for feeding a laminar strip 70, comprising an upper layer 66 of glassine adhesively secured to a lower layer 71 of backing, and with take-up means for taking up the ladder 72 of waste glassine produced in the cutting operation. The feed means comprises a feed reel 73, a guide roll 74, a stripper plate 75 having a dull knife edge 75a, a drive roll 76 mounted on a shaft 77 and a squeeze roll 78. A receptacle 79 is provided to receive the waste backing. The take-up means comprises a take-up roll 85 mounted on a shaft 86 which may be rotated by a knob 87, and a squeeze roll 88. A receptacle 89 is provided for receiving the ladder of waste glassine.

A driving connection of known type is provided between the shafts 86 and 77 by means of pulleys 90 and 91 and a spring belt 92.

In operation, a sufficient length of glassine is peeled from the backing and is threaded between the upper and lower dies and between the take-up roll 85 and squeeze roll 88 as illustrated. A statistical card 32 is provided having an area 100 on its upper surface which may be coated with an adhesive repellent lacquer, the purpose of which is explained hereinafter. The card 32 is properly registered with the die openings by means of the guide plates 30, 31 and 33 and the lever 28 is depressed to actuate the lower die 20 and the upper dies 42 and 47.

The timing of the cams 26 and 64 and the shape and dimensions of the cutting dies are such as to perform the following sequence of operations: As lever 28 is depressed, the upper die 42 descends, punches out a rectangular segment or blank of glassine from strip 66 and continues descent toward card 32. Lower die 20 ascends and reaches card 32 simultaneously with upper dies 42 and 47. Die 42 presses the margins of the glassine segment against the card 32 and at the same time countersinks it, as at 103, so as to leave the glassine flush with ther top surface of the card. During this operation the card is backed up by the die plate 22. Lower die 20 penetrates the card to sever a plug 101 without disturbing the glassine, during which time the card and glassine are backed up by die 42. Die 47 then penetrates the glassine to sever a plug 104, thus forming a glassine frame 105. During this time the card is backed up by die 20. Finally, on release of the lever 28, the dies will be restored to their initial, inactive position in readiness for a new cycle which, is carried out by inserting another card 32, rotating the knob 87 and then depressing the lever 28 again.

The travel of the lower die 20 and the travel of the upper dies 42 and 47 are such as to cut only the card 32 and the glassine 66, respectively, and the relative positions, shape and dimensions of the dies and of the area 100 are such as to provide the article illustrated in Fig. 6. Thus, the card 32 is provided with a plug 101, a glassine frame 105 is adhesively mounted on and countersunk in the card in registry with the plug 101 and a glassine plug 104 on the card plug 101.

A unitary article is thus provided which is adapted to storage and shipment. When it is desired to mount a microfilm exposure on the frame 105, it is necessary only to punch out the glassine plug 104 and card plug 101. This is easily accomplished by placing the card with the card plug facing downwardly on a flat surface with the plugs overlying an opening in the surface, and then punching the plugs with any suitable instrument.

Referring now to Fig. 4, there is shown a modification wherein the card punching and glassine punching operations are performed at separate stations. Similar parts are similarly numbered, and the structure and mode of operation will be obvious from the drawings and the foregoing description.

It is thus apparent that an apparatus and a method have been provided for forming die-cut openings in statistical cards and the like, cutting out adhesive-coated frames of material for such openings, and mounting the frames upon the card in registry with the apertures. It is also apparent that a novel and useful article is provided which is adapted to storage, shipment and handling without exposure of adhesive-coated frame until it is desired to mount a microfilm exposure on the card.

While we have illustrated and described our invention in detail, it is to be understood that various changes may be made therein by those skilled in the art without departing from the invention as defined in the appended claims.

Having thus described our invention, what we claim and desire to secure by Letters Patent is:

1. Apparatus of the character described comprising a bed plate providing support for a card, a female die, cooperating inner and outer male dies operable to punch a segment of adhesive-coated material from a strip thereof to mount the same on a card disposed on said bed plate and to perform an inner punch on the mounted segment, another die disposed on the opposite side of said card and operable to punch out a segment of said card having edges intermediate the edges of said first-mentioned segment and inner punch, and means for actuating said dies so that said outer male die and said another die engage the card simultaneously.

2. Apparatus of the character described comprising a bed plate providing support for a card, a female die, cooperating male dies operable to punch a segment of adhesive-coated material from a strip thereof, to mount the same on a card disposed on said bed plate and to perform an inner punch on the mounted segment, another die disposed on the opposite side of said card and operable to punch out a segment of said card having edges intermediate the edges of said first-mentioned segment and inner punch, means for feeding a laminar strip of backing and adhe-

sive-coated material to said female die and cooperating male dies and means for peeling said backing strip from said adhesive-coated material in advance of said dies.

3. Apparatus of the character described comprising a bed plate providing support for a card, a female die disposed on one side of said bed plate and spaced a sufficient distance therefrom to accommodate a card therebetween in registry with the die opening of said female die, cooperating inner and outer male dies operable, respectively, to punch a segment of adhesive-coated material overlying said opening and mount the same on a card and to perform an inner punch on the mounted segment, another die disposed on the opposite side of said card, reciprocable in said bed plate and operable to punch out a segment of said card having edges intermediate the edges of said first-mentioned segment and inner punch, and means for actuating said dies so that the outer male die and said another die engage the card simultaneously.

4. Apparatus of the character described, comprising a framework including and defining a punching station, means for feeding a laminar strip of adhesive-coated glassine or the like and backing toward said station, means for peeling said backing from said glassine in advance of said station, a bed plate having a die opening in registry with said punching station, a male die reciprocable within said opening, a female die having a die opening in registry with said first-mentioned die opening, said female die being spaced from said bed plate a sufficient distance to accommodate a card, guide means for aligning a card on said bed plate to register a predetermined portion of said card with said die openings, inner and outer male dies reciprocable in said second-mentioned die opening, and means for actuating said male dies to punch a segment from said glassine, mount the segment on said card, perform an inner punch on the mounted segment and punch out a segment of said card having edges intermediate the edges of said glassine segment and inner punch.

5. A method of punching adhesive-coated material and mounting the same on a card or the like, comprising providing a die having a die opening defining a punching station, providing and supporting cards in sequence on one side of said die in registry with said die opening, feeding a strip of adhesive-coated material to said station, punching segments therefrom in sequence, feeding each segment through said die opening to said card, pressing each segment against its card with a force sufficient to countersink the segment into its card, punching each mounted segment to punch out an inner segment, and punching said card from the side opposite said segment to punch out a card segment having edges intermediate the edges of the outer and inner segments of adhesive-coated material.

6. A method of punching adhesive-coated material and mounting the same on a card or the like, comprising mounting adhesive-coated segments on cards or the like, punching an inner segment from each mounted segment of adhesive-coated material and punching the card from the opposite side to punch a card segment having edges intermediate the edges of said segments of adhesive-coated material.

7. A method of punching adhesive-coated material and mounting the same on a card or the like, comprising providing cards each having a portion coated with adhesive repellent lacquer, mounting adhesive-coated segments on said cards in registry with said lacquered portions, punching an inner segment from each mounted segment of adhesive-coated material and punching the card from the opposite side to punch a card segment having edges intermediate the edges of said segments of adhesive-coated material.

8. A method of punching adhesive-coated material and mounting the same on a card or the like, comprising providing a strip of adhesive-coated material, providing cards or the like each having a portion coated with an adhesive repellent lacquer, punching segments from said strip of adhesive-coated material, mounting each segment on a card in registry with said lacquered portion, punching an intermediate segment from each mounted segment and punching each card on the side opposite said segement to punch a card segment having edges intermediate the edges of the segments of adhesive-coated material.

9. Apparatus of the character described comprising a bed plate providing support for a card, a female die, cooperating male dies operable to punch a segment of adhesive-coated material from a strip thereof, to mount the same on a card disposed on said bed plate and to perform an inner punch on the mounted segment, another die disposed on the opposite side of said card and operable to punch out a segment of said card having edges intermediate the edges of said first-mentioned segment and inner punch, means for feeding a laminar strip of backing and adhesive-coated material to said female die and cooperating male dies, means for peeling said backing strip from said adhesive-coated material in advance of said dies and means for actuating said dies, so that at least one of the male dies and said another die engage the card simultaneously.

10. Apparatus of the character described comprising a bed plate providing support for a card, a female die disposed on one side of said bed plate and spaced a sufficient distance therefrom to accommodate a card therebetween in registry with the die opening of said female die, cooperating inner and outer male dies operable, respectively, to punch a segment of adhesive-coated material overlying said opening and mount the same on a card and to perform an inner punch on the mounted segment, another die disposed on the opposite side of said card, reciprocable in said bed plate and operable to punch out a segment of said card having edges intermediate the edges of said first-mentioned segment and inner punch, means for actuating said dies so that said outer male die and said another die engage the card simultaneously, and means limiting the movement of the inner male die beyond outer male die to a distance substantially equal to the thickness of the adhesive-coated material.

11. Apparatus of the character described comprising a bed plate providing support for a card, a female die disposed on one side of said bed plate and spaced a sufficient distance therefrom to accommodate a card therebetween in registry with the die opening of said female die, cooperating inner and outer male dies operable, respectively, to punch a segment of adhesive-coated material overlying said opening and mount the same on a card and to perform an inner punch on the mounted segment, another die disposed on the opposite side of said card, reciprocable in said bed plate and operable to punch out a segment of said card having edges intermediate the

edges of said first-mentioned segment and inner punch, and means limiting the movement of the inner male die beyond the outer male die to a distance substantially equal to the thickness of the adhesive-coated material.

12. Apparatus of the character described comprising a bed plate providing support for a card, a female die disposed on one side of said bed plate and spaced a sufficient distance therefrom to accommodate a card therebetween in registry with the die opening of said female die, cooperating inner and outer male dies operable, respectively, to punch a segment of adhesive-coated material overlying said opening and mount the same on a card and to perform an inner punch on the mounted segment, another die disposed on the opposite side of said card, reciprocable in said bed plate and operable to punch out a segment of said card having edges intermediate the edges of said first-mentioned segment and inner punch, and means limiting the movement of said another die beyond the bed plate to a distance substantially equal to the thickness of the card.

13. Apparatus of the character described comprising a bed plate providing support for a card, a female die disposed on one side of said bed plate and spaced a sufficient distance therefrom to accommodate a card therebetween in registry with the die opening of said female die, cooperating inner and outer male dies operable, respectively, to punch a segment of adhesive-coated material overlying said opening and mount the same on a card and to perform an inner punch on the mounted segment, another die disposed on the opposite side of said card, reciprocable in said bed plate and operable to punch out a segment of said card having edges intermediate the edges of said first-mentioned segment and inner punch, means limiting the movement of the inner male die beyond the outer male die to a distance substantially equal to the thickness of the adhesive-coated material, and means limiting the movement of said another die beyond the bed plate to a distance substantially equal to the thickness of the card.

14. Apparatus of the character described comprising a bed plate providing support for a card, a female die, cooperating male dies operable to punch a segment of adhesive-coated material from a strip thereof, to mount the same on a card disposed on said bed plate and to perform an inner punch on the mounted segment, another die disposed on the opposite side of said card and operable to punch out a segment of said card having edges intermediate the edges of said first-mentioned segment and inner punch, means for feeding a laminar strip of backing and adhesive-coated material to said female die and cooperating male dies and means for peeling said backing strip from said adhesive-coated material in advance of said dies, and means limiting the movement of one of the male dies beyond the other male die to a distance substantially equal to the thickness of the adhesive-coated material.

15. Apparatus of the character described comprising a bed plate providing support for a card, a female die, cooperating male dies operable to punch a segment of adhesive-coated material from a strip thereof, to mount the same on a card disposed on said bed plate and to perform an inner punch on the mounted segment, another die disposed on the opposite side of said card and operable to punch out a segment of said card having edges intermediate the edges of said first-mentioned segment and inner punch, means for feeding a laminar strip of backing and adhesive-coated material to said female die and cooperating male dies, means for peeling said backing strip from said adhesive-coated material in advance of said dies, and means limiting the movement of said another die beyond the bed plate to a distance substantially equal to the thickness of the card.

16. Apparatus of the character described comprising a bed plate providing support for a card, a female die, cooperating male dies operable to punch a segment of adhesive-coated material from a strip thereof, to mount the same on a card disposed on said bed plate and to perform an inner punch on the mounted segment, another die disposed on the opposite side of said card and operable to punch out a segment of said card having edges intermediate the edges of said first mentioned segment and inner punch, means for feeding a laminar strip of backing and adhesive-coated material to said female die and cooperating male dies, means for peeling said backing strip from said adhesive-coated material in advance of said dies, means limiting movement of the male die performing the inner punch beyond the other male die to a distance substantially equal to the thickness of the adhesive-coated material, and means limiting movement of said another die beyond the bed plate to a distance substantially equal to the thickness of the card.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,943,022	Koster	Jan. 9, 1934
1,967,534	McClean	July 24, 1934
2,353,232	Greene	July 11, 1944
2,355,706	Cross	Aug. 15, 1944
2,437,022	Fritzinger	Mar. 2, 1948
2,441,821	Kendall	May 18, 1948

FOREIGN PATENTS

Number	Country	Date
244,422	Great Britain	Mar. 4, 1926