Oct. 19, 1965 J. F. LANGAN ETAL 3,212,206

APERTURE CARDS

Filed April 30, 1962 2 Sheets-Sheet 1

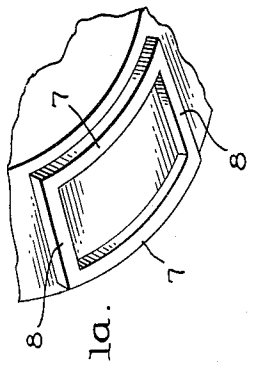

FIG. 1a.

FIG. 1.

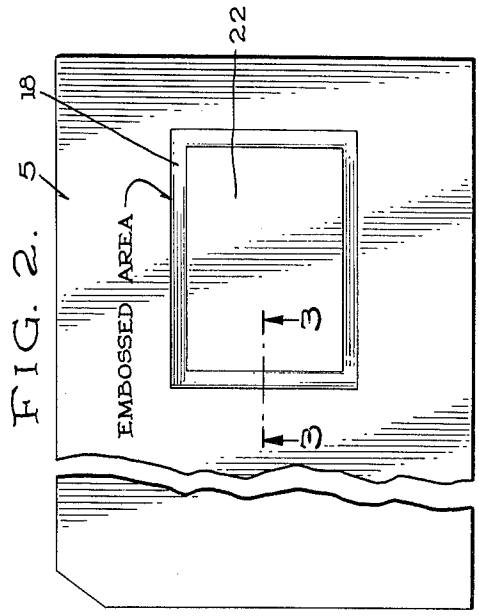

FIG. 2.

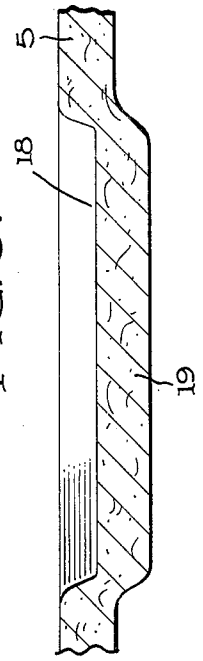

FIG. 3.

INVENTORS
JOHN F. LANGAN
LORIMER CLAYTON, JR.
GRANT E. ALLEN, JR.
BY Cameron, Kerkam & Sutton
ATTORNEYS

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FIG. 4.

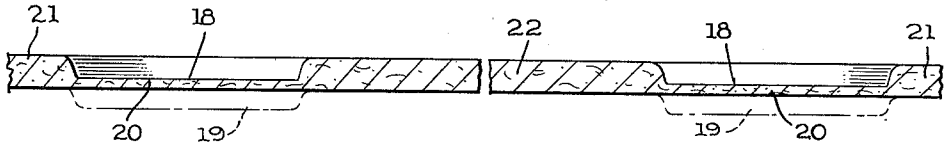


FIG. 5.

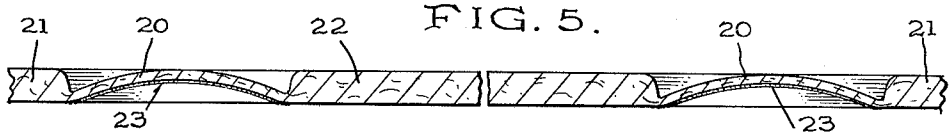


FIG. 6.

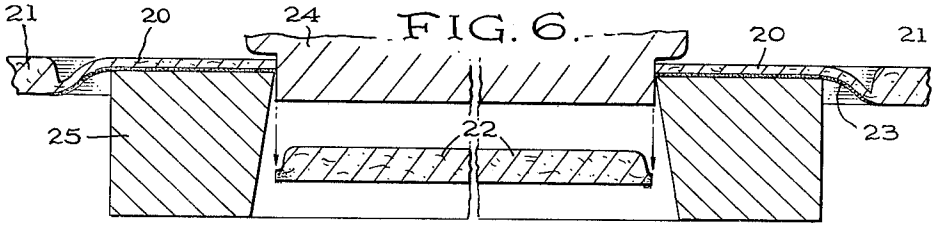


FIG. 7.

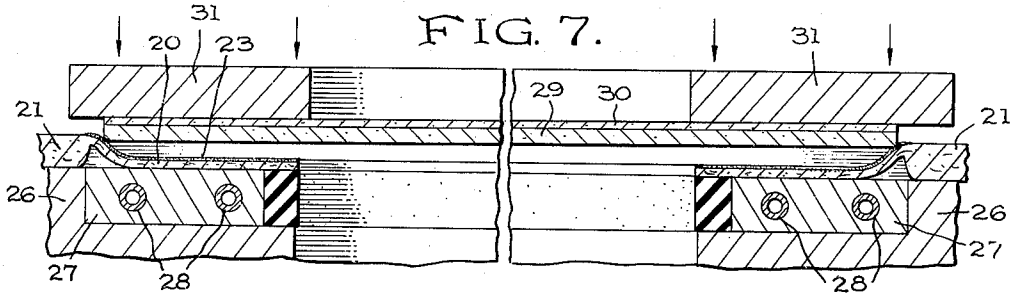
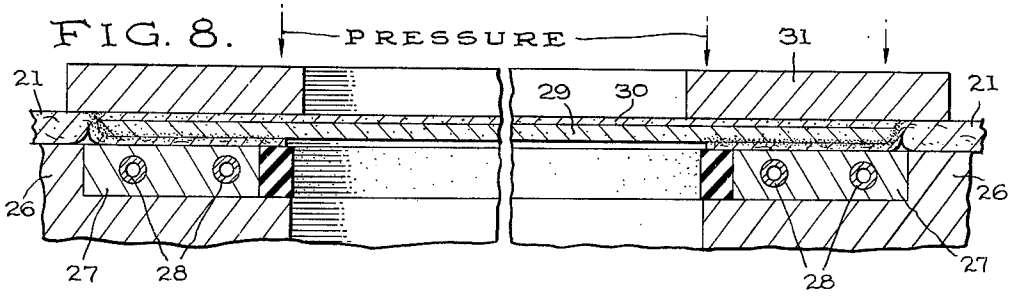


FIG. 8.



INVENTORS
JOHN F. LANGAN
LORIMER CLAYTON, JR.
GRANT E. ALLEN, JR.

BY Cameron, Kerkam & Sutton
ATTORNEYS

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3,212,206

APERTURE CARDS

John F. Langan and Lorimer Clayton, Jr., Atlanta, and Grant E. Allen, Jr., College Park, Ga., assignors to Langan Aperture Cards, Inc., Greenvale, N.Y., a corporation of Delaware

Filed Apr. 30, 1962, Ser. No. 191,117
4 Claims. (Cl. 40—158)

This invention relates to improvements in cards adapted for mounting projectable transparencies such as for example film record cards in which individual microfilm sections are mounted to facilitate the handling, filing and storage of the transparencies, and also the sorting out, projecting and if desired the reproducing of individual transparencies when desired. The invention relates especially to novel blank cards adapted for such uses and to their manufacture.

The invention is particularly useful in mounting microfilm sections in cards that are capable of being sorted mechanically, although it is not limited to this use as explained hereinafter. Various types of mechanical sorting systems are well known. They range from systems in which groups of related cards can be separated and extracted from a stack by inserting a pin or like instrument through aligned holes in the edges of the cards, to the elaborate and well known IBM system in which the cards are perforated according to a code and are sorted by electrically controlled apparatus responsive to the location of the perforations in the individual cards. However, the invention also comprehends the mounting of projectionable transparencies, including all types of photographic film records, in ordinary file cards, catalog cards, and the like.

With reference to machine sorting of the IBM type, the present invention comprises important improvements of the "punch cards" or "aperture cards" disclosed in the prior Langan Patents Nos. 2,511,859, 2,512,106, and 2,587,022, as well as in the preparation and use of such cards. Aperture cards of the type shown in these prior patents have been very widely used, especially by the United States Government. By way of example, a current program of standardization of the preparation and distribution of engineering data by this system, such as drawings, specifications and the like, in one particular Government field is estimated to require 90 million aperture cards initially and average annular usage thereafter of 15 million aperture cards.

The merit of such aperture card systems is attested by their widespread adoption and successful use, in spite of serious defects of prior systems which are corrected by the present invention. One such defect has had to do with the "blank" cards as supplied heretofore in bulk quantity to the ultimate user, i.e., before the film is mounted therein. As disclosed in the prior Langan Patent No. 2,511,859 mentioned above, these blank cards are distributed with the aperture already formed and with a strip of pressure-sensitive adhesive material secured to the backside of the card around the edges of the aperture, a narrow section of this strip extending into the aperture with exposed adhesive thereon for subsequent mounting of a transparency in the aperture. This exposed adhesive is covered by a temporary sheet of glassine paper or similar material.

In the first place, such "blank" cards cannot ordinarily be furnished to a prospective user in large supply because they must be used within a relatively short period or else the adhesive deteriorates to the point where adequate bonding of the transparency cannot be secured. In large part because of this inability to store reserve supplies of blank cards, the common practice has been for the customer to send his microfilm to a central service center

where the individual film sections are mounted in the cards. The fact that the customer cannot cut out and mount sections himself, as and when desired, has heretofore made for inflexibility in the use of the aperture cards and has detracted seriously from the utility and desirability of aperture card systems.

The factor mentioned above also makes it practically impossible to use aperture cards for mounting two or more sequential transparencies on the same card, as is often desirable in order to "post" a record of successive stages of development of a project. In such case, it is desirable to mount the first transparency in one aperture of a card, and to be able to supplement the original record by mounting a second transparency at some later date in a second aperture of the same card. Using cards of the type heretofore used, however, when the time came for mounting the second transparency, the pressure-sensitive adhesive material around the second aperture would no longer be effective so that a separate card would have to be used.

Another problem arises from frequent sticking together of adjacent cards due either to exposed pressure-sensitive adhesive in the case of imperfect preparation, or to "bleeding" of the pressure-sensitive adhesive material from underneath the edges of the protective glassine cover sheet or the edges of the transparency itself. In such cases the separation of blank cards for perforation according to a mechanical sorting code, or for the operations of mounting sections of film therein, or during subsequent use of the finished cards for machine sorting, projection, and the like, is hindered to an extent which militates seriously against the usefulness of such systems.

Furthermore, any increase in thickness of such cards is very undesirable. Even though an applied strip of adhesive may only increase the thickness of a card by an extremely small amount, say $\frac{1}{1000}$ of an inch, still when a deck of 1000 or more cards are stacked in a file drawer as is often the case, there will be a difference of an inch or more in the length of one side of the stack as compared with the other.

Still further objections to prior systems arise from the fact that the operations involved in preparing the blank cards, i.e., punching out the apertures and then applying the adhesive strips and the cover sheets, as well as the operations involved in finishing the cards including stripping off the cover sheets and disposing of them and then applying the transparencies to the exposed adhesive strips, both require objectionably elaborate and expensive apparatus such as illustrated for example in the prior Standish Patent No. 2,666,543, the prior Morrison Patents Nos. 2,493,159 and 2,560,301, and the prior Baker Patent No. 2,643,786. Many users of aperture cards have only a relatively small number of transparencies to be mounted at one time, and this only sporadically, so that they cannot justify the expense of purchasing and maintaining such elabroate equipment but must again rely on service centers such as mentioned above.

But perhaps a more basic objection is that the bond between the transparency and the card is not secure enough in many cases. For example, under ordinary conditions of usage, a deck comprising 1000 cards bearing microfilmed engineering drawings should last for years despite repeated handling incident to removing the card from and returning them to the drawer, riffling decks of cards before placing them in sorting machines, handling individual cards in projection machines, print copiers, and the like, etc. In the course of such manipulations, the cards are repeatedly subjected to twisting and bending from all angles. Unless the bond between the film section and the card is continuous, strong, and permanent, separation of the film from the adhesive may eventually occur with the result that the card must be thrown

away and the film section re-mounted in a fresh blank card.

Added to the above disadvantages is the fact that even though the aperture in the blank card is covered by a temporary removable cover sheet, still the presence of the aperture is undesirable for various reasons. It obviously detracts from the mechanical strength of the blank card, and it may interfere with and hinder the perforation of the card for mechanical storting before the transparency is mounted.

Various attempts have been made to eliminate the use of such pressure-sensitive adhesives and to remedy the defects mentioned. By way of example, the prior Langan Patent No. 2,587,022 suggests heat bonding of thermoplastic materials to the card, proposing to cover the aperture with a sheet of cellulose acetate and to bond its edges by heat and pressure to the edges of the card around the aperture. The material of this cover sheet was proposed to be the same as or similar to that of the base of the film itself, with the thought that subsequently the film section and the cover sheet could be united integrally by heat and pressure to form a unitary transparency across the aperture. Usually heat damage to the film resulted, however, such as clouding and/or buckling or warping of the film. Moreover, the bond formed by heating the cellulose acetate cover sheet and pressing it into contact with the card, or by doing the same thing to the edges of the cellulose acetate base of the film itself as suggested in the prior Langan Patent No. 2,633,655, was unsatisfactory. If the degree of heat was only enough to soften the cellulose acetate it would not penetrate the fibers of the card and the bond was weak and unsatisfactory. Attempts to increase fluidity by raising the temperature usually caused warping or buckling of the card itself.

A step toward the elimination of the above difficulties has been disclosed and claimed in the copending application of John F. Langan, Serial No. 70,814 filed November 21, 1960 and entitled Aperture Card System, now U.S. Patent No. 3,165,848. As disclosed in this prior application, the strength of the eventual bond between the film and the card is materially increased by applying a solution of thermoplastic material to the card so that it soaks into the card fibers. Accordingly when the solvent dries out, the thermoplastic solute is left not only on the surface of the card but also beneath its surface and distributed on and among the fibers of the card structure. Then when the bond is ultimately formed, this thermoplastic material and the thermoplastic film base as well are softened by heat so as to become tacky and merge or weld together under pressure to join the film to the card with a bond strength that is much higher than can be obtained by mere surface adhesion. It has been found, however, that the heat required to secure effective welding and that warping or other damage to the card usually results.

As will be explained hereinafter, the present invention involves to some extent an impregnation of the card fibers with bonding material according to the aforesaid prior application Serial No. 70,814. However, one of its important advantages is that substantially less heat is required for bonding. Accordingly the bonding material should be one that is dry and non-sticky or non-tacky at ordinary temperatures and up to say 200° F., since business machine mechanisms often develop temperatures around 150° F. or more as the result of sustained operation. However, in order to avoid using too high temperatures during the bonding of the film section on the card, the bonding material should be heat activatable at a temperature in the range of 250° F. to 350° F. Usually it is preferred to employ blends of commercially available elastomeric and resinous products in suitable solvents such as methyl ethyl ketone, isobutyl ketone, acetone, and the like or in the form of fast drying emulsions. The commercially available normally liquid adhesive known as "Pliobond" gives very satisfactory results. In fact, this material can be activated without heat by the addition of a small amount of solvent.

As in the prior application mentioned above, the zone of application of the solution to the card must be such that the bonding material will be located around the edges of the aperture, when it is eventually cut out. Of course, this can be accomplished by applying the solution over the entire area of the aperture, or for that matter over the entire area of the card when it is manufactured, but it is more economical to apply the solution in a strip pattern following the outline of the aperture to be cut out, or of the several apertures to be cut out, as the case may be.

The solution can be applied in the desired strip pattern or patterns by hand by simply brushing it on the surface of the card, but usually suitable mechanical applicator means will be preferred. For example, the cards may be moved in succession through a zone in which the desired strip pattern application is effected by relative movement between the individual cards and suitable applicators. A reciprocable stamping device with a suitable inker can be used, or the cards may be fed in succession through rotary printing devices; in either case the solution, colored or not, provides the "ink" with which the card is printed in the desired pattern.

Thus cards embodying the present invention, before the film is mounted therein, provide the very substantial advantages over the prior art mentioned above with regard to storage, distribution, etc. However, the present invention provides further advantages of major importance because it is not necessary to heat-soften the edges of the film section and then to compress them together with the card to thin the edges by plastic flow and to force the film down into the aperture, as disclosed for example in prior Langan Patent No. 2,633,655 mentioned above.

Preferably (but not necessarily as pointed out below) the first step in the present invention is to indent one side of the card around the outline of the aperture eventually to be cut therein, so as to form a trench-like depression in one face of the card and a corresponding ridge-like projection embossed on the opposite surface of the card. It will be apparent that this stamping or embossing operation can be performed by any suitable type of reciprocating or rotating die mechanism. While it has been proposed heretofore to pre-dimple such cards by compressing the edges of the aperture, as for example in the prior Patent No. 2,633,655, the extent of such dimpling that can be produced merely by compression, without embossing the opposite side of the card, is limited by the compressibility of the card material and as a practical matter a depression of say 0.001–0.002 inch is about the maximum that can be realized with the usual card having an initial thickness of approximately 0.0067 inch. Such depressions are not of sufficient depth to accommodate the thickness of the film (varying from about 0.003 to about 0.0055 inch) and accordingly a very large amount of thinning of the margins of the film by plastic flow and deformation is required in order to approach the desired final condition illustrated in said prior patent. According to the present invention, on the other hand, grooving or indentation of the card on one side can easily be made much deeper by permitting the card to be embossed on the other side, the stamping or embossing operation producing a sort of bending or folding of the card material instead of compression thereof.

The next step according to the present invention is to remove the ridge-like embossed projection from the opposite surface of the card in any suitable manner so as to restore the surface on this side of the card to a planar condition. This can be accomplished by any suitable cutting or shaving operation, but most conveniently by high speed grinding or abrasion applied to the cards

while moving relatively past the grinding device. This produces a card which is substantially planar over one side and is planar on the other side as well except that around the outline of the aperture eventually to be cut out, there is a trench-like depression the bottom of which is formed by a thin web of card material. When the portion of the card surrounded by this trench is eventually cut out to form the aperture, the combined thickness of the film and of the ledge around the aperture (which ledge previously formed the bottom of the groove) is not materially, if any, more than the thickness of the card. By way of example, a card initially 0.0067 inch thick may be embossed and ground to a web thickness of about 0.015–0.002 inch in the bottom of the trench around this aperture and the added thickness of the usual silver halide film of say 0.0055 inch makes a total of around 0.007 inch.

It will be understood that the depth to which the blank cards are stamped, or embossed, and the corresponding thickness of the card material at the bottom of the groove may vary depending upon the kind of film to be mounted, the web being for example from about 0.004 inch to about 0.002 inch or less for film varying in thickness within the range stated above. Nevertheless the strength of such thin sections necessary for handling the cards is provided by the thermoplastic bonding material. In the case of cards impregnated throughout in the course of manufacture, the thermoplastic material will already be present in the card fibers of the thinned sections before and during the embossing and grinding operations. In other cases where it is preferred to apply the bonding material in a strip pattern around the outline of the aperture, a solution thereof can be applied by hand or preferably by mechanical means such as a suitable rotating "inking" member and a cooperating fountain or other supply of solution, and as this solution dries, the thermoplastic bonding material remains to provide the strengthening effect already mentioned. An additional advantage of the present invention is that because the card surface in the area to which bonding material is applied has been roughened and de-sized by the grinding operation, with the result that the solution quickly penetrates into the fibrous card structure and dries to leave the thermoplastic bonding material not only coated over the ground surfaces but also extending into the fibrous structure of the web, often throughout its entire thickness.

It has been proposed heretofore to remove material from one surface of a card by means of grinding or milling so as to thin the card throughout a predetermined area intended to receive a laminar insert such as a film (see for example British Patent No. 886,852). Such cards are unsatisfactory, however, because the very thin web of card material remaining over the entire area of the eventual aperture is not strong enough to meet the conditions of use of aperture cards while still in "blank" condition, i.e., without having film inserts mounted thereon for indefinite periods. On the other hand, it is impracticable to employ a grinding or milling tool following the narrow rectangular path characteristic of the present invention relative to each individual card. These deficiencies of cards such as disclosed in the British patent are avoided by the method of the present invention in which material is removed from the card only over the aforesaid narrow rectangular path. Because of the embossing, the grinding or milling effect is limited to this area while at the same time the desired removal of the raised or embossed material is accomplished by unidirectional movement of the card past the grinding or milling tool in a single pass. During such grinding or milling, it is important to support the embossed area against the pressure of the tool to prevent the card material from being flattened out again with consequent spreading of the effect of the tool beyond the desired limits and/or failure to accomplish the desired removal. Therefore the card should be

left on the embossing die, or placed on a similar die-like support, while removal of the card material is taking place. Preferably this die or support for the bottom of the embossed groove should be high enough so that there will be space or clearance during grinding for card areas beyond the top surface of the support to depress or fall away from the tool and thus limit its effect to an area corresponding closely in shape and extend with said top surfaces. For many purposes it may be satisfactory merely to place the card on a support of the type just described without prior embossing since in any event the area of effectiveness of the grinding or milling tool will be limited essentially to the area of the supporting surfaces.

Except in the case of pre-impregnated card materials, blank cards embodying the present invention are completed by the application of the solution of bonding materials as already described, preferably to the areas from which embossed material has been removed. For most purposes it is desirable to apply the solution in sufficient quantity to leave a film of solid thermoplastic bonding material on the web surfaces, say 0.0003 inch to 0.0005 inch thick. The blank cards are then ready for storage, sale and/or use for the purposes and with the advantages already explained.

When it comes to mounting the transparency in a blank card of the above type, the transparency is prepared in any suitable way. For example, it may require edge trimming to the desired shape and size which obviously can be done by hand if desired. In cutting out transparencies from a roll of film or the like, however, suitable die-cutting apparatus, either hand or power operated, will usually be preferred. It will be understood that the film size should be limited so that it overlaps the thin web surrounding the aperture but not the thicker surrounding card.

The same type of die-cutting operation is preferred for cutting out the apertures in the cards. With the aid of suitable registering means, the cards can be fed one by one to a die in position that such operation of the die cuts the aperture with its edges lying in the thinned web of card material to which the bonding material has been applied. Any desired type of feeding mechanism can be used, or the cards can be fed by hand. For most purposes a simple reciprocating die is satisfactory; it can be operated by hand or foot or by any desired power means.

The actual bonding operation may not require heat if provision is made for activation of the bonding material by solvent addition. However, mild heat in the range of 250°—350° F., can also be employed for activation of the bonding material, but without substantial softening of the film itself. For this purpose it is preferred to employ a hot die having the rectangular shape and size of the perimeter of the aperture and a hot surface approximately ⅛″ wide. Preferably this hot surface is brought in contact with the web on the side opposite to that to which the film is applied. The heat passes quickly through the thin web and softens the thermoplastic bonding material next to the film, the rapid heat transfer due to the thin web enabling the use of lower temperatures and/or shorter times. Simultaneous pressure is applied to squeeze the web and film together. The amount of pressure is not critical and can vary widely, say in the range of 100 p.s.i. to 1000 p.s.i. Under these conditions plastic flow of the activated bonding material can take place in forming the bond, but no plastic deformation of the film itself occurs.

One embodiment of the invention has been illustrated diagrammatically in the accompanying drawings, but it is to be expressly understood that said drawings are for purposes of illustration only and are not to be taken as a definition of the limits of the invention, reference being had to the appended claims for this purpose.

In the drawings,

FIG. 1 is a diagrammatic illustration of the sequence

of steps involved in preparing blank cards embodying the present invention in automated manner;

FIG. 2 is a plan view of one of the finished blank cards;

FIG. 3 is a section on the line 3—3 of FIG. 2;

FIGS. 4 and 5 are sectional views corresponding to FIG. 3 but showing subsequent successive steps in the completion of the blank cards;

FIG. 6 illustrates diagrammatically the step of cutting out the aperture in a blank card;

FIG. 7 shows the operation of bonding a section of film in place on the card; and

FIG. 8 shows the completed card with the film mounted therein.

Referring first to FIG. 1, a stack of cards to be processed is indicated by the numeral **1** at the left hand side of the figure. For example, these cards may be "punch" cards of the usual type employed with the IBM system of tabulating card machines, being formed of card stock having a specified thickness of 0.0067 inch with a tolerance of plus or minus 0.0004 inch. As will be understood, the stack of cards can be supported in any suitable magazine from which the cards are fed one by one in succession from the bottom of the stack in the direction indicated by the arrow **2**, such feeding mechanisms being well known in the art.

As already stated, the first step according to the present invention comprises an embossing or stamping operation. When the cards are to be printed, this embossing operation can be combined with the printing press if desired so that the printed cards leave the press in embossed condition, but as here shown for purposes of illustration, the embossing operation is performed by passing the cards longitudinally in succession between the upper embossing roller **3** and a lower backing roller **4** of rubber or the like. One of the cards is shown at **5** as it passes between these rollers and is embossed in the desired pattern by means of dies **6** carried by the roller **3** at peripheral intervals corresponding with the rate of feed of cards **5**.

A detailed diagrammatic view of one of these embossing dies is shown in FIG. 1A. It comprises raised ribs **7** extending circumferentially of the roller **3** and parallel to but spaced from one another, the ends of these ribs being cross-connected by transverse ribs **8** so that the ribs together form a rectangular outline to be embossed on the card **5**. Of course, other shapes may be desirable. The height of the ribs **7** and **8** will obviously be predetermined so as to produce embossing of the desired depth, depending upon the thickness of the film to be mounted and to some extent also on the yieldability of the rubber backing roller **4**. It will be evident that a similar die arrangement can be provided on a conventional reciprocating stamping die.

Having been embossed, the cards pass from the rollers **3**, **4** to a second set of rollers **9** and **10** which accomplish the operation of removing the embossed ridges from the back of the card as described above. In order to provide the desired support against the pressure of the operative lower wheel **10**, the upper wheel **9** carries a series of die-like supports **11** similar in size and shape to the dies **6** of the roller **3**. The grinding wheel, by way of example, may be an aluminum oxide wheel running at a surface or linear peripheral speed of approximately 2300 feet per minute, having a wheel grit size of 46–60 and wheel hardness in the range of G to J (the letters at the beginning of the alphabet indicating softer grades). Of course, these values are not critical; for example, the linear peripheral speed of the grinding wheel may vary between approximate limits of 1800 feet per minute and 3000 feet per minute.

Referring to FIG. 3, the depth of embossing by the dies **6** may be approximately 0.0045 inch, in the case of relatively thick film such as the usual silver halide film which approximates 0.0055 inch. In such a case, the height of the ribs forming the dies **6** at supports **11** should be somewhat higher, say in the range of 0.006 inch to 0.01 inch. In passing between the rollers **9** and **10**, therefore, the embossed ridges are removed from the back of the card as explained above, converting it from the condition shown in FIG. 3 to that shown in FIG. 4 and leaving a web thickness of about 0.002 inch.

For the purpose of applying the solution of thermoplastic bonding material, any suitable printing device can be employed. As illustrated diagrammatically in FIG. 1, the cards **5** pass in succession between a backing roll **12** and a printing roller **13** having on its surface suitable solution-applying means **14** such as a pad or wick arranged in a pattern to correspond with the pattern or embossing and grinding previously performed. Any known type of solution supply can be employed, and for purposes of illustration FIG. 1 shows an "inking" roller **15** which rotates partially submerged in a bath **16** of the desired solution and transfers the solution to the applicator means **14**.

Following the application of the bonding solution, which dries rapidly (this can be hastened by conventional means such as hot air blasts, infra-red radiation or the like), the cards **5** pass to any suitable receptacle here shown as a stack **17**.

FIG. 3, as already noted, shows the condition of the blank cards after having passed between rollers **3** and **4**. During this passage, die members **6** create an indented groove **18** on one side of the card and a corresponding ridge-like projection **19** on the other side. As will be understood from the foregoing general description, the groove **18** may be approximately ⅛ inch wide and follows the rectangular outline of the aperture eventually to be cut in the card.

The card **5** next passes between the wheels **9** and **10**, where its condition progresses to that shown in FIG. 4 wherein the ridge-like projections **19** of FIG. 3 have been ground away, leaving the thin webs **20** forming the bottom of said grooves and connecting the surrounding major portion of the card indicated at **21** with the rectangular section **22** which is eventually to be removed to form the aperture. As already pointed out, these webs **20** may be as little as 0.0015 inch to 0.002 inch, and while they are quite narrow (usually 0.125 inch), nevertheless in the condition shown in FIG. 4 they are too weak for safety in storage, distribution and handling of such cards before the film is actually inserted therein. Application of the solution of thermoplastic bonding material by the roller **13**, however, results in some impregnation of the webs **20**, as indicated by the stippling in FIG. 5, and also in building up a relatively thin but substantially continuous external layer of solid thermoplastic bonding material indicated at **23**. As a result, the inherently weak thin webs **20** are substantially strengthened to withstand all normal conditions of use of the blank cards, including not only manual handling but often the punching of said cards by machine according to desired machine sorting codes, etc. At the same time these webs are pushed in by the applicators **14** as shown in FIG. 5.

When it comes to mounting the desired section of film in a card of the type described, the first operation is to die out the aperture as indicated diagrammatically in FIG. 6 in which a suitable punch **24** punches out the section **22** through an opening in the base **25** by which the card **5** is supported. As shown, the dimensions of the opening of the base and of the punch are such that the cut is made through the thin webs **20** around the section **22**, leaving the major portions of these webs projecting into the aperture. Having thus formed the aperture, the desired section of film is then brought to the position shown in FIG. 7. Here the card **5** rests on a supporting table **26** comprising a heated support **27** which has substantially the same size and shape as the portions of the webs **20** which project into the aperture and overlap the edges of the film section. The central part of this support **27** is preferably left hollow or empty. Heat may be

supplied to the support **27** in any desired way, as by conventional electrical heating coils **28** which maintain the surfaces of the support at a temperature of say 300° F. The film section can be applied either to the front or back of the card, but preferably is in direct contact with the coating **23** of bonding material which is preferably applied to the ground areas of the back of the card as already stated. This preferred arrangement is shown in FIG. **7**, wherein the film, comprising the usual base **29** coated with the usual emulsion **30**, is positioned with its edges overlapping the coated and impregnated webs **20**. Pressure is then applied by means of any suitable pressure plate **31**, simultaneously with the softening of the bonding material by heat supplied through the support **27**. The result is that the webs **20** and the film itself are forced downwardly in the aperture in the card to a position substantially as indicated in FIG. 8 in which the outer surface of the emulsion side **30** of the film is substantially flush with the upper surface of the card, whereas the outer surface of the base **29** of the film is bonded to the underlying webs **20** and is substantially flush with the lower surface of the card. In the illustration given above, the total thickness of the web (say 0.0015") and of the film (about 0.0055") is 0.007 inch which is within the prescribed tolerance limits of card thickness.

While only one embodiment of the invention has been specifically described and illustrated, it is to be understood that the invention is not restricted to this embodiment and that reference should be had to the appended claims for a definition of the limits of the invention.

What is claimed is:

1. A record card adapted to be apertured at a predetermined location for projectably mounting sections of microfilm and like projectable transparencies which comprises a flat thin card made of fibrous card stock approximately 0.0067" thick except for a narrow elongated strip extending around the outline of the aperture to be formed in the card, said strip having a thickness in the range of from 0.002" to 0.004" and forming a web which connects the card section surrounded thereby with the outer sections of the card as a continuous integral structure, said card sections and connecting strip all having the substantially unchanged and uncompressed fibrous structure of the original card stock and said strip having an abraded roughened surface on one side of the card, said abraded surface being coated with bonding material adapted to be utilized subsequently for bonding a film section in the card.

2. A record card as defined in claim **1**, said thinner strip comprising a section of the original card stock from which surface material has been abraded to reduce its thickness to the aforesaid range.

3. A record card adapted to be apertured at a predetermined location for projectably mounting sections of microfilm and like projectable transparencies which comprises a flat relatively thin card made of fibrous card stock of uniform thickness except for a thinner narrow elongated strip extending around the outline of the aperture to be formed in the card, said strip having a thickness of less than half that of the card and forming a web which connects the card section surrounded thereby with the outer sections of the card as a continuous integral structure, said card sections and connecting strip all having the substantially unchanged and uncompressed fibrous structure of the original card stock, said strip having an abraded roughened surface on one side of the card and being coated on said abraded surface with bonding material adapted to be utilized subsequently for bonding a film section in the card.

4. A record card as defined in claim **3**, said strip being coated on its abraded side and at least partially impregnated with thermoplastic bonding material.

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EUGENE R. CAPOZIO, *Primary Examiner.*

EDWARD V. BENHAM, LAWRENCE CHARLES, JEROME SCHNALL, LEONARD W. VARNER.
Examiners.