Dec. 20, 1966 H. M. HOPEN 3,292,632

CARD FILE

Filed Sept. 10, 1964

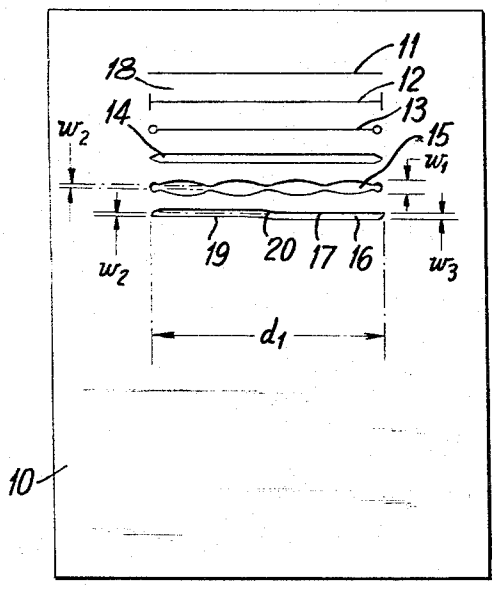

FIG. 1

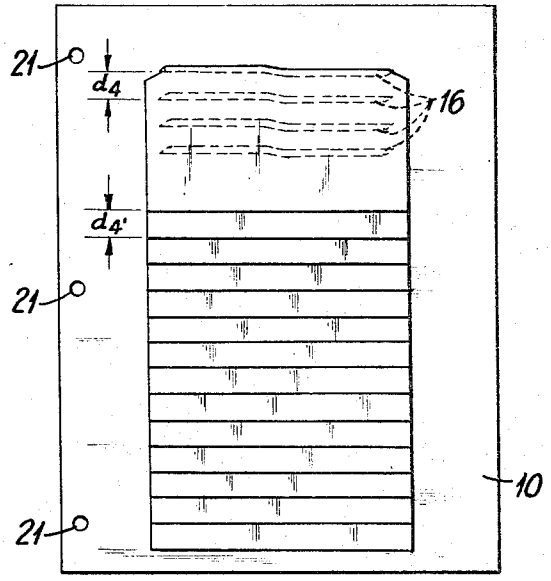

FIG. 3

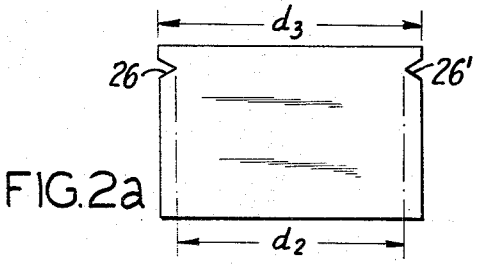

FIG. 2a

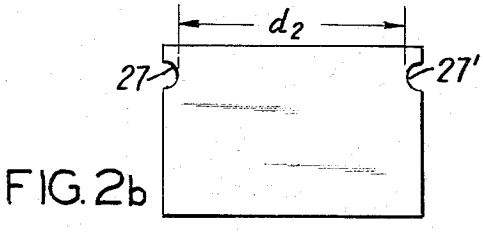

FIG. 2b

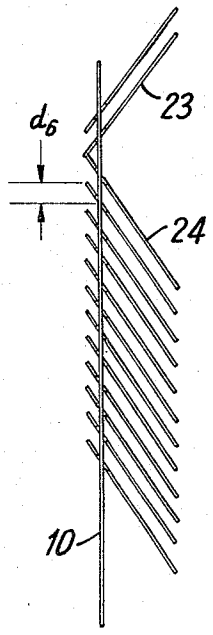

FIG. 4

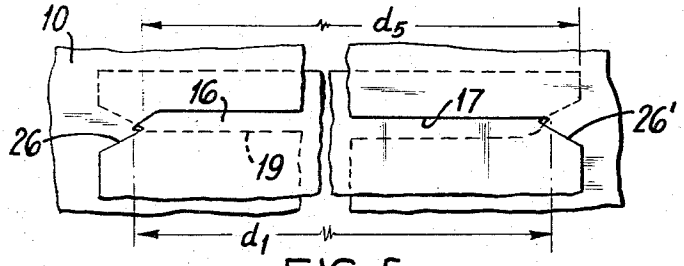

FIG. 5

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CARD FILE

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4 Claims. (Cl. 129—20)

This invention is a continuation-in-part of application Serial No. 291,584, filed on June 28, 1963 and now abandoned, and relates generally to a novel card file, and in particular to the constituent information cards and mounting member which, in conjunction with one another, and without more, make up an assembly adapted for information exposure by card rotation or flipping.

Conventional devices for supporting cards in a rotatable or flippable manner (for information exposure) take varied forms and are subject to a number of disadvantages, depending upon the particular structure involved. A representative system employes a mounting member having a plurality of hinged frames or clear plastic envelopes for holding the cards. While such an arrangement allows a fairly flat final assembly vis-a-vis, for example, a circular file, it is not the ultimate in compactness nor is it always an easy matter to assemble or interchange the cards in the array. Further, while the majority of these arrangements allow each card or a plurality of the cards to be simultaneously flipped or rotated 180°, to expose a particular card front or back, and also allow a sufficient portion of each card to be continuously exposed for positive indexing (both clear cut advantages) a counterbalancing consideration is the cost involved which tends to become prohibitive in large scale use. Included in the cost of the above is the necessity of a design provision for obviating any possible tendency of the cards to catch each other when a plurality are simultaneously rotated. This inherently arises in the frame type devices, where the card is mounted in the frame.

Accordingly, it is the object of this invention to provide a card file which is simple to operate, rotates freely, is inexpensive to purchase and maintain, which provides positive indexing to the degree required, and which is the optimum in flatness.

It is a feature of this invention to provide positive indexing not only on the front portion of the card, but also on the back portion, either of which may be viewed without flipping the covering cards.

The above mentioned and other features and objects of this invention and the manner of attaining them will become more apparent and the invention itself will best be understood by reference to the following description of embodiments of the invention taken in conjunction with the accompanying drawings wherein:

FIG. 1 shows a mounting member according to the invention, having a plurality of distinct slot embodiments superposed for the purpose of illustration;

FIGS. 2*a* and 2*b* illustrate two embodiments for the card to be operatively associated with the mounting member of the invention;

FIG. 3 shows the final card file assembly, incorporating the preferred embodiments of FIGS. 1 and 2;

FIG. 4 is a side view of a card file assembly of FIG. 3 with several of the cards flipped 180°; and

FIG. 5 is an enlarged detail of the end pivots formed by a slot and associated card.

Referring now to FIG. 1, there may be seen a mounting member **10** of thin resilient material such as cardboard, plastic, etc. For purposes of illustration, several tandem slots, **11** through **16**, are arranged in parallel; each depicting a different embodiment. It will be understood, however, that generally only a plurality of one type slot will be employed (such as shown in FIG. 3). The

slots are shown in the order of their development with the most preferred arrangement at the bottom.

Before undertaking an analysis of the different slots with their respective merits, the cards to be used in conjunction with the mounting member will first be described so that the form which a particular slot takes will be appreciated. The cards shown in FIGS. 2*a* and 2*b* are of a rectangular shape to permit easy typing of information on the card. At this juncture, it is sufficient to point out that for operability certain dimensions must be present (as will be explained hereinafter) if the cards are to be operatively positioned in the associated slot; beyond these, however, the card may take any shape commensurate with its purpose and desired esthetics. The cards are formed with internally faced arcuate (FIG. 2*b*) or triangular (FIG. 2*a*) notches (**26**, **26'**, **27** and **27'**) which, in conjunction with the slot ends, form defined pivots. While only two types of notches have been shown, it will be appreciated that the notch may take any form so long as the functional requisites are fulfilled.

Either the slots or the cards are dimensioned (in the direction along the slot) so that d_2, the distance between the internal-most notch portions, is less than or equal to the slot length d_1; and d_3, the overall card length, is greater than d_1. Preferably, d_2 should be less than, rather than equal to, d_1. While this permits some play in the end pivots, the cards are more easily inserted and less friction is encountered during rotation.

Turning back to FIG. 1, each slot will be briefly analyzed. The first and uppermost slot is merely a slit **11** within which a card is mounted by flexing the card, to reduce the distance between its ends, and then inserting it into the slot. This procedure applies to each of the embodiments and will therefore not be reiterated. Although operable, such an arrangement was found to unduly restrict card rotation; the rib **18** having a tendency to bind the card during angular displacement. Rib restriction is reduced by providing perpendicular slot-end-relief either by the circular cutout shown in slot **13** or the cross slits of slot **12**. This allows play in the slit edges bearing upon the card, and hence easier rotation.

Slot **14** has a width generally greater than the thickness of a card, with the slot ends reduced angularly to defined pivots. This embodiment provides still easier card rotation. Some lateral play in proximity to the card center is encountered, however.

The embodiments **15** and **16** are the preferred ones. The former, slot **15**, contains a plurality of edge scallops; the slot opening varying along its length from a maximum w_1, of several card thicknesses, to a minimum w_2 of approximately one card thickness. While arcuate scallops are shown, they may take any form (for example saw tooth) which gives the desired bearing points. The slot ends are again reduced to a single pivot, this time circular. This arrangement provides a plurality of small bearing points along the slot length which enhance free rotation while reducing lateral play.

Slot **16** retains the foregoing advantages but takes a somewhat different form. This slot comprises a pair of offset parallel lengths in communication with one another via the slot length **20**. The thickness w_3 of the two slot lengths, is greater than one card thickness; however, due to the offset distance (to be described) a pair of bearing edges is always present, thus obviating any lateral play. The foregoing occurs as a result of the separation w_2 between edges **17** and **19**, which is approximately one card thickness. This fact, in conjunction with the tapering of the slot ends towards the common rectilinear portion of the slot (w_2) ensures that regardless of the direction of card rotation, the bearing edges **17** and **19** always enhance rotation; with the slot width being sufficient to obviate any binding effect by the adjacent ribs. The slot itself may

be visualized as a pair of lap-joined lengths (including a common portion (w_2)).

FIGS. 3 and 4 illustrate the preferred assembly. In the latter figure the distance between adjacent cards is emphasized for clarity. Actually, these cards, a portion of which have been flipped-up for illustrative purposes, would lay flat one on another without spacing. The positive indexing width d_4' (that portion of the card always exposed) depends upon, and is equal to, the slot separation d_4, which is predetermined for a particular mounting member. If the cards are all of the same size, positive indexing must arise, since necessarily there must be slot separation. Three holes **21** are depicted to illustrate the adaptability of this flat assembly to inclusion in a conventional three-ring binder.

The side view of FIG. 4 shows that positive indexing also appears on the back side of the mounting member. Here the indexing width is d_6 and equals the distance from the notch pivot points to the card top. This distance may be varied, and depends upon the use involved and such considerations as the closeness of the notch to the top (danger of tearing) and the slot separation d_4 (permissible lap between adjacent cards **23** and **24** disposed 180° apart). Suffice to say, these considerations naturally depend upon the materials employed for the card and mounting member.

FIG. 5 is a detail of an assembled portion of the card file, particularly emphasizing the pivotal ends and widths d_5 and d_1. The distance d_1 is that previously encountered and is the slot length. d_5, on the other hand, is the distance from one inner notch portion to the opposite card edge. In the preferred embodiments d_5 would be slightly greater than d_1. This allows card insertion upon the most limited flexing and prohibits card withdrawal without flexing. With respect to the FIG. 2 dimensions d_2, the distance between the innermost notch portions, and d_3, the distance between the card ends, the following relationship is realized as the preferred one:

$$d_5=(d_3-d_2)/2+d_2=(d_3+d_2)/2$$

and therefore $(d_3+d_2)/2$ is slightly greater than d_1.

The exact amount that the first expression exceeds the second will depend on the material employed, the type of notch, the closeness of the notches to the top, etc.

While I have described above the principles of my invention in connection with specific apparatus, it is to be clearly understood that this description is made only by way of example and not as a limitation to the scope of my invention as set forth in the objects thereof and in the accompanying claims.

I claim:

1. A card file comprising in combination: a mounting member consisting essentially of a substantially rigid sheet having a plurality of parallel tandem slots therein, each of said slots including a pair of parallel offset lengths communicating via another length at the approximate slot center, the adjacent edges of said pair of offset lengths being separated by a distance approximately equal to the thickness of the card to be mounted therein to provide a common rectilinear slot portion having a width approximately equal to the thickness of said card whereby the adjacent edges of said offset lengths of each slot act as bearing edges about which said card is adapted to rotate; and a plurality of cards, mounted in said slots, each of said cards having a pair of inwardly disposed notches at opposite ends thereof embracing the respective ends of the associated slot.

2. The card file claimed in claim **1** in which the slot ends are tapered to a defined pivot disposed between the said adjacent edges.

3. The card file claimed in claim **1** in which said communicating length is at least as great in width as the width of one of said pair of offset lengths.

4. The card file claimed in claim **1** in which said offset lengths of each slot overlap one another to form said communicating length.

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