United States Patent [19]

Mathiesen

[11] **3,822,082**

[45] **July 2, 1974**

[54] **MAGNETIC CARD FILING EQUIPMENT**

[76] Inventor: **Nicolaus Per Mathiesen,** 1512 Primm Ave., San Jose, Calif. 95122

[22] Filed: **Aug. 14, 1972**

[21] Appl. No.: **280,168**

[52] **U.S. Cl.** **312/183,** 40/105.5

[51] **Int. Cl.** **A47b 63/00,** G09d 1/00

[58] **Field of Search** ..... 312/183; 211/DIG. 1; 248/106 A; 40/105.5

[56] **References Cited**

UNITED STATES PATENTS

2,762,373	9/1956	Rosenberg	40/105.5
3,303,848	2/1967	Dahl	40/105.5
3,333,590	8/1967	Dahl	40/105.5
3,465,460	9/1969	Dahl	40/105.5

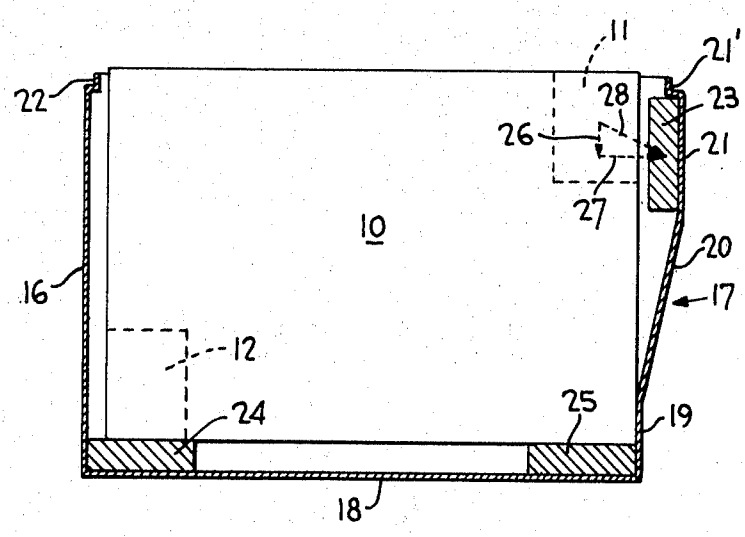
Primary Examiner—Paul R. Gilliam

Attorney, Agent, or Firm—Watson, Cole, Grindle & Watson

[57] **ABSTRACT**

A magnet card filing system of the type in which the cards, having inserts of magnetic material, are spread apart by magnetic repulsion induced in the inserts by permanent magnets associated with the tray containing the cards. In the present case each card has an insert adjacent an upper corner and a second insert adjacent the diagonally opposite lower corner, the tray having elongated permanent magnets adjacent said inserts for inducing the usual repulsion effect and additionally for holding the bottom edges of the cards in close contact with supporting rails at the bottom of the tray, whereby inadvertent tilting or lifting of the cards is prevented.

5 Claims, 3 Drawing Figures



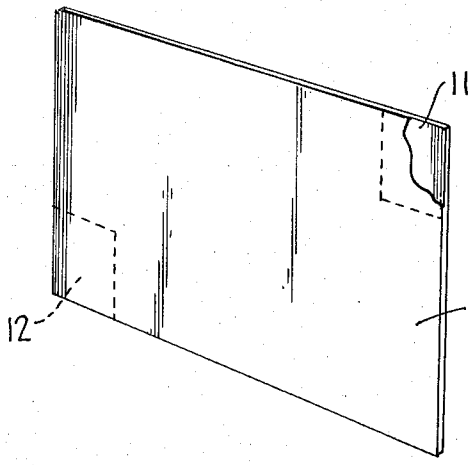


FIG. 1

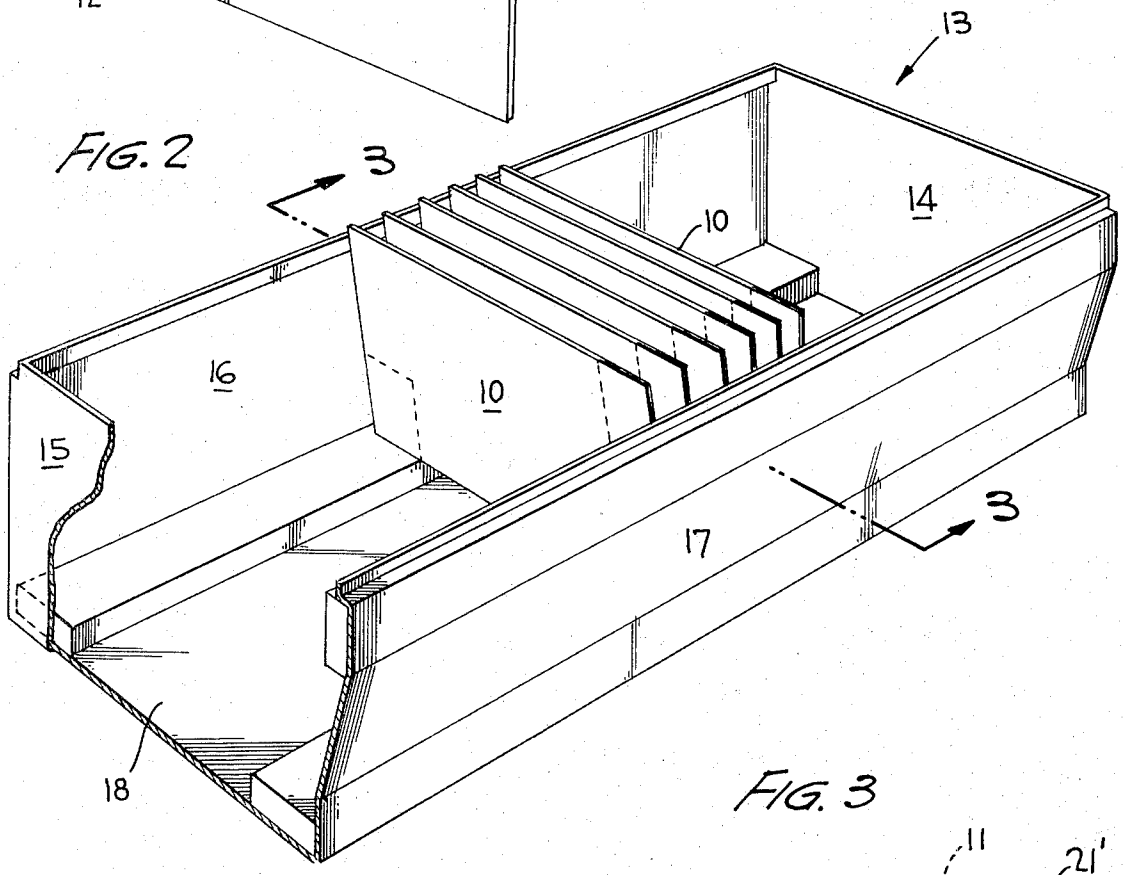
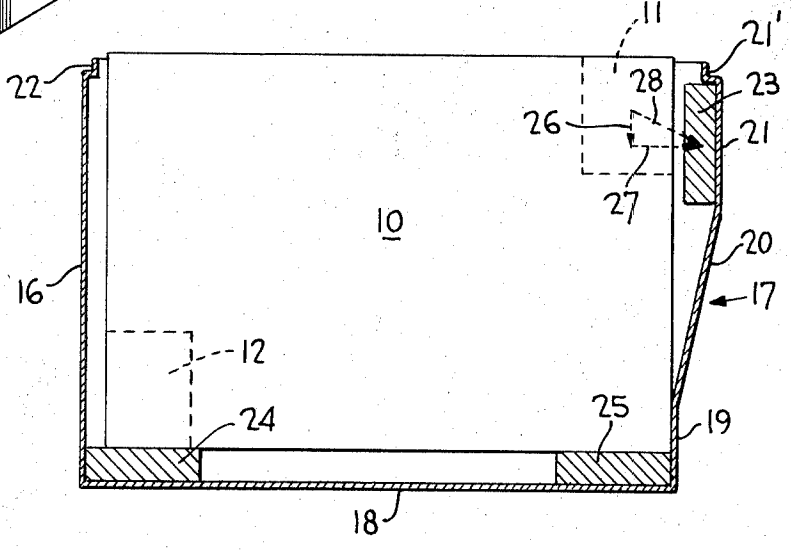


FIG. 2

FIG. 3



MAGNETIC CARD FILING EQUIPMENT

BACKGROUND OF THE INVENTION

1. Field of the Invention

Magnetic card filing systems now in use employ cards provided with inserts of soft iron or other magnetic material, usually one such insert being provided adjacent each upper corner of each card. The cards are stacked in trays provided with rails on which the lower or bottom edges of the cards rest, and permanent magnets adjacent the upper edges of the side walls of the trays are used to cause spreading or "fanning out" of the cards through induced magnetic repulsion acting between the inserts in adjacent cards. Such systems are disclosed in U.S. Pats. Nos. 2,656,091, 2,722,936, 2,871,862 and 2,984,243.

Such systems, on the whole, have proven quite satisfactory, but are subject to the difficulty that, occasionally, one or more of the cards that are spread apart, and thus relieved of static frictional forces tending to keep them in mutual alignment, may be sufficiently affected by the attractive force of one or another of the adjacent permanent magnets to tilt laterally toward the magnet and thus become disaligned with the other cards of the tray, requiring manual replacement in proper position. Also, since the inserts are usually spaced somewhat below the upper edge of the associated card and thus below the upper edges of the adjacent magnets, there is a lifting tendency which may result in a nonuniform position of the upper edges of the cards.

2. Description of the Prior Art

The patents mentioned above are representative of the prior art.

SUMMARY OF THE INVENTION

According to the present invention, the aforesaid disadvantages are overcome by repositioning the card inserts of magnetic material, one being placed at or near an upper corner of the card and the other at or near the diagonally opposite lower corner. The permanent magnets are similarly repositioned, one of them serving as a bottom rail of the tray, which has a nonmagnetic rail at the other side of the bottom, and the other magnet being affixed to an upper portion of a tray side wall, adjacent but spaced laterally from the upper corner card inserts and positioned slightly lower than directly opposite said inserts, whereby both magnets exert a downward pull on the cards, maintaining their lower edges in firm contact with said bottom rails. In this way the inadvertent tilting or lifting of the cards is prevented, while at the same time the cards can be readily moved by hand, as desired, and the repulsion spreading effect is not hindered but, to the contrary, is enhanced.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of a card provided with magnetic inserts in accordance with the invention;

FIG. 2 is a perspective view of a tray containing a number of cards, all in accordance with the invention, one end of the tray being partly broken away; and

FIG. 3 is a transverse section on line 3—3 of FIG. 2.

DESCRIPTION OF THE PREFERRED EMBODIMENT

In order to facilitate an understanding of the invention, reference is made to the embodiment thereof shown in the accompanying drawings and detailed descriptive language is employed. It will nevertheless be understood that no limitation of the invention is thereby intended and that various changes and alterations are contemplated such as would ordinarily occur to one skilled in the art to which the invention relates.

The index card designated **10** in FIG. **1** is provided with an insert **11** of magnetic material, for example soft iron, at its upper right-hand corner and a second similar insert **12** at its lower left-hand corner. The inserts **11** and **12** preferably, but not necessarily, extend to the adjacent edges of the card **10** and in any case must be located near diagonally opposite corners of the card. In all other respects, the cards **10** may be similar to those heretofore used in magnetic card filing systems such as described above.

Referring to FIG. **2**, the tray **13** comprises end walls **14** and **15**, side walls **16** and **17**, and bottom **18**, all of nonmagnetic material. As best seen in FIG. **3**, the side wall **17** is formed to provide a substantially vertical lower portion **19**, an inclined intermediate portion **20** and a substantially vertical upper portion **21** with an inturned angle portion **21'** at its upper edge. The side wall **16** is preferably, although not necessarily, vertical and is similarly provided with an inturned angle portion **22** at its upper edge. The angle portion **21'** assists in locating the elongated, vertically polarized permanent magnet **23** which is affixed to the inner surface of the portion **21** of the side wall **17**, and both angle portions **21'** and **22** serve to stiffen the side walls **16** and **17** which may be made of relatively light and flexible material. An elongated, horizontally polarized permanent magnet **24** is affixed to the bottom **18** adjacent the side wall **16** and serves as one bottom rail upon which the lower edges of the cards **10** are supported. A bottom rail **25** of nonmagnetic material but similar in shape and dimensions to the magnet **24** is affixed to the bottom **18** adjacent the lower portion **19** of the side wall **17**.

It will be noted that the magnet **23** affixed to the upper portion **21** of the side wall **17** is, by reason of the outward inclination of the wall portion **20**, spaced slightly laterally of the card inserts **11**, and by reason of the angle portion **21'** is displaced slightly downwardly from a position directly opposite the inserts **11**. The attractive force of the magnet **23** upon the inserts **11**, therefore, is exerted downwardly and laterally as indicated by the arrows **26** and **27** of FIG. **3** which combine to produce a resultant force indicated by the arrow **28**. This force, together with the attractive force exerted by the magnet **24** upon the inserts **12**, cause the lower edges of the cards **10** to be held firmly against the bottom rails **24** and **25**, without in any way interfering with the repulsion effect between the inserts of adjacent cards which cause the cards to separate or "fan out" as seen in FIG. **2**. This "hold down" effect is optimum if the lower insert **12** extends to the lower edge of the card **10**, as shown, so that it makes direct contact with the magnet **24**. This direct contact also enhances the repulsion forces and thus the "fan out" effect.

Naturally, the positions of the magnets and inserts may be reversed from that described above and shown in the drawings, so long as one insert is near one upper corner of a card and the other insert is near the diagonally opposite lower corner thereof, the permanent magnets being placed accordingly.

I claim:

1. In a card file system of the type in which the cards are provided with inserts of magnetic material and the tray for holding the cards is provided with one or more permanent magnets for inducing like magnetic poles at corresponding positions in the inserts of adjacent cards, whereby the cards are caused to spread apart by magnetic repulsion, the improvement consisting in providing each card only with one magnetic insert near one of its upper corners and a second magnetic insert near its diagonally opposite lower corner, and providing the tray with longitudinally extending permanent magnets located adjacent said inserts, one of said magnets constituting a bottom rail of said tray and being horizontally polarized and the other said magnet being affixed to a side wall of said tray near the upper edge thereof and being vertically polarized, said last mentioned magnet being located near said upper corner inserts but spaced therefrom laterally and displaced slightly downwardly from a position directly opposite said upper corner inserts, whereby the magnetic attractive forces exerted on said upper corner inserts act laterally and downwardly, said tray having a non-magnetized bottom rail at the side opposite said first magnet, the attractive force exerted by both magnets serving to cause firm contact between the lower edges of said cards and said bottom rails while permitting the cards to spread apart through magnetic repulsion.

2. The combination defined in claim **1,** said side wall to which said other magnet is affixed having a substantially vertical lower portion, an outwardly inclined intermediate portion, and a substantially vertical upper portion to the inner surface of which said magnet is secured.

3. The combination defined in claim **1,** the lower edge of said second magnetic insert extending to the lower edge of its associated card whereby it is adapted to make direct contact with said bottom rail magnet.

4. A file card for use in a card file system of the type in which the cards are provided with inserts of magnetic material and the tray for holding the cards is provided with one or more permanent magnets for inducing like magnetic poles at corresponding positions in the insert of adjacent cards, whereby the cards are caused to spread apart by magnetic repulsion, the improvement wherein each card only has one magnetic insert near one of its upper corners and a second magnetic insert near its diagonally opposite lower corner whereby when such card is utilized in a card file system the magnetic forces which act on the upper insert in the card act in a lateral and downward direction.

5. A file card as defined in claim **4,** said second insert extending to the lower edge of said card.

* * * * *