United States Patent [19]

Walter et al.

[11] **3,844,649**

[45] **Oct. 29, 1974**

[54] **MICROFICHE CARRIER**

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[73] Assignee: **Varian Adco,** Palo Alto, Calif.

[22] Filed: **May 8, 1972**

[21] Appl. No.: **251,176**

[52] **U.S. Cl.** ..... **353/120,** 206/62 R

[51] **Int. Cl.** **G03b 21/00,** G03b 21/64

[58] **Field of Search** 353/120, 122, 116; 209/80.5, 111.8; 40/152, 158

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Primary Examiner—Louis R. Prince
Assistant Examiner—A. J. Mirabito
Attorney, Agent, or Firm—Flehr, Hohbach, Test, Albritton & Herbert

[57] **ABSTRACT**

A carrier for handling microfiche film in data handling and retrieval systems. The carrier is adapted to be received in such a system for storage in a bin and means are provided on the carrier itself to cooperate with the pin for accurate registry between coded information on the carrier and code reading apparatus in the system. The coded carrier includes a removable portion such that new codes may be applied on a reused carrier.

11 Claims, 19 Drawing Figures

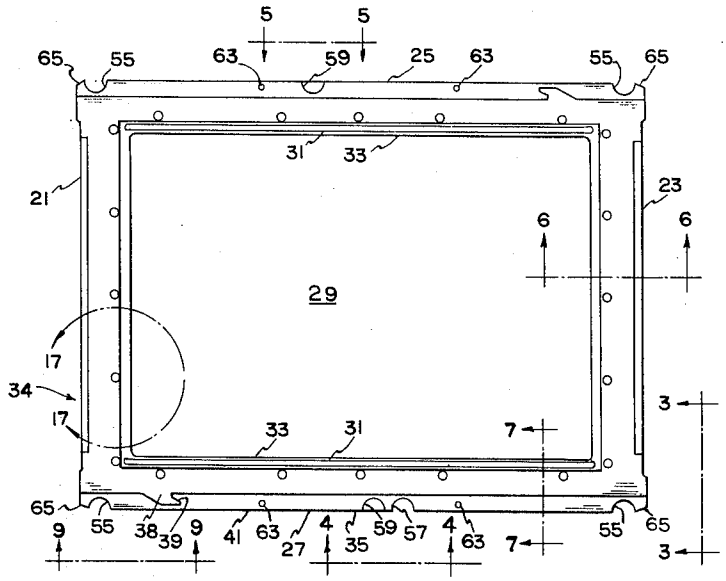


FIG. 1

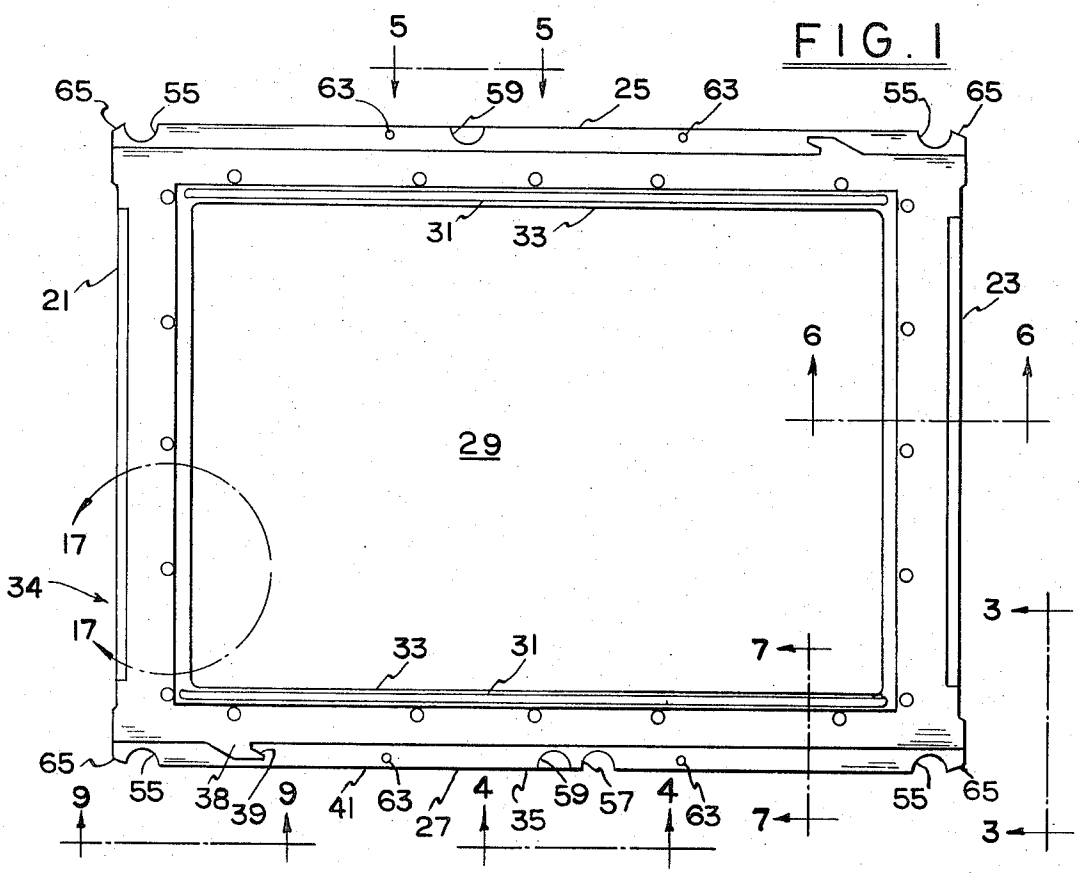

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FIG. 2

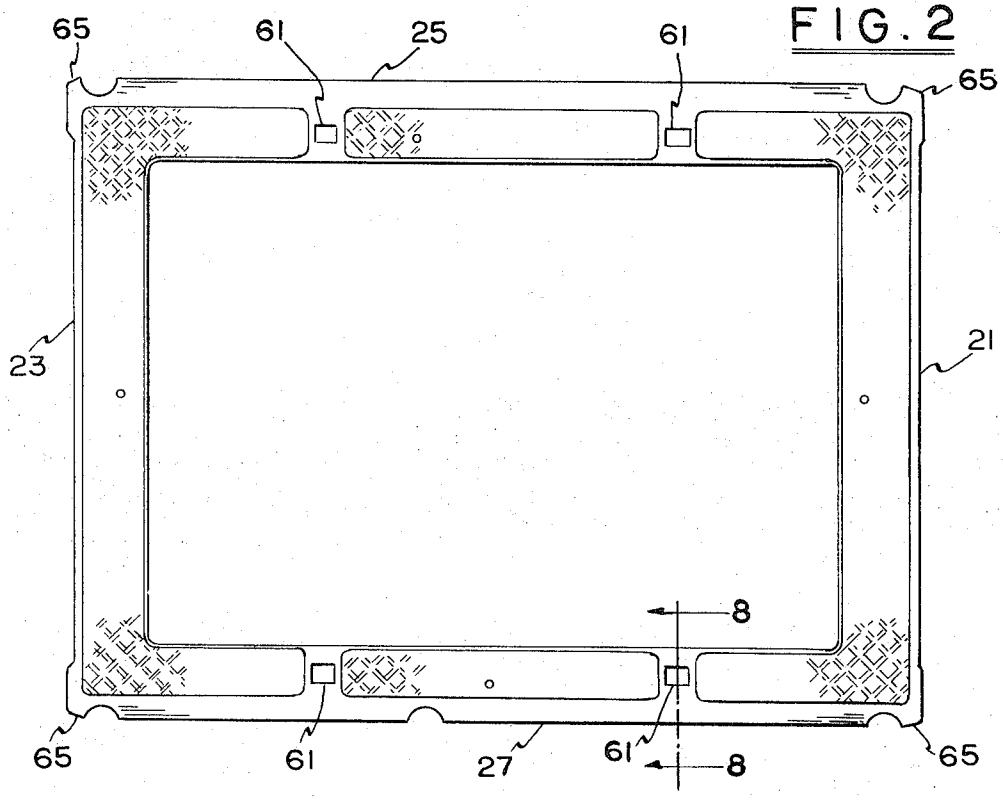

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FIG. 3

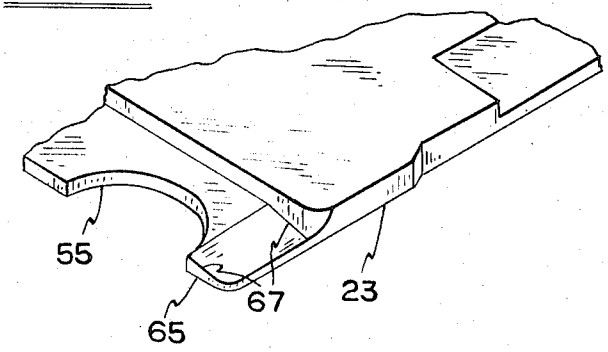


FIG. 4

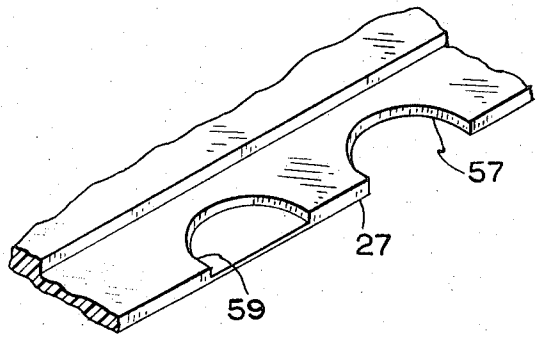


FIG. 5

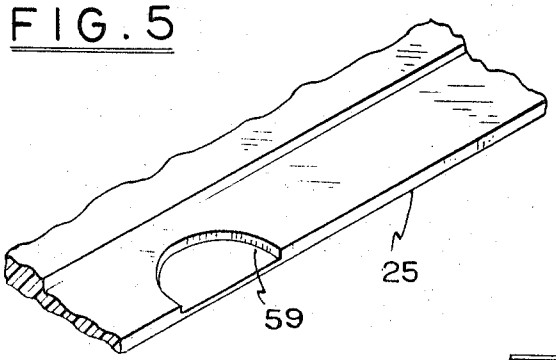


FIG. 6

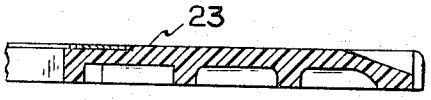


FIG. 7

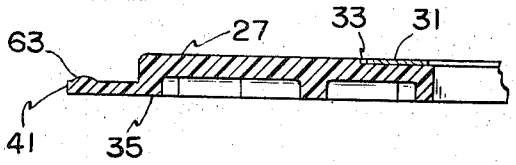


FIG. 8

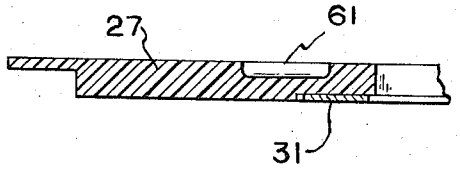


FIG. 9

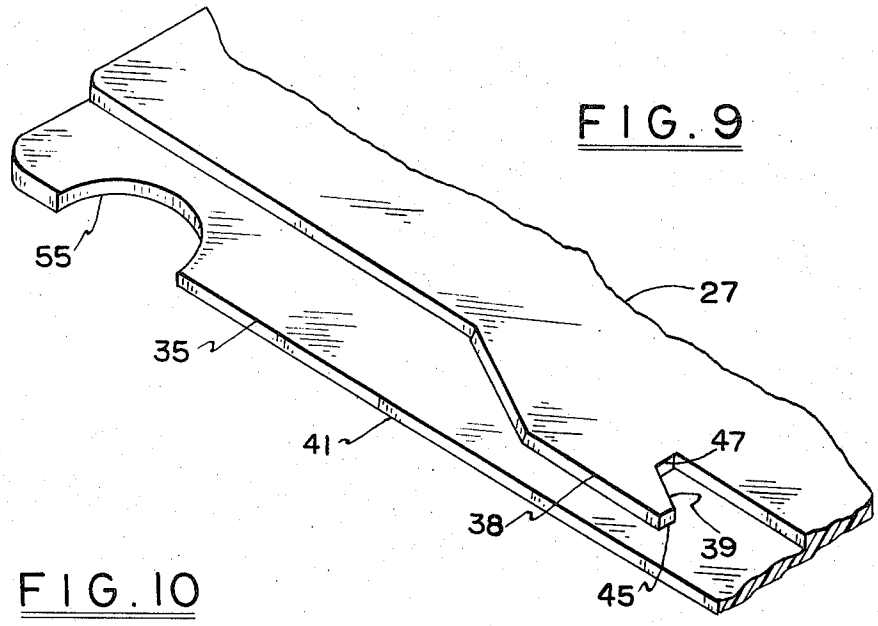


FIG. 10

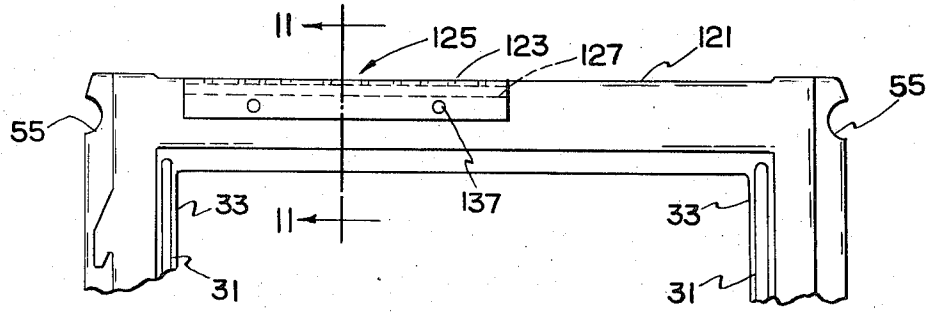


FIG. 11

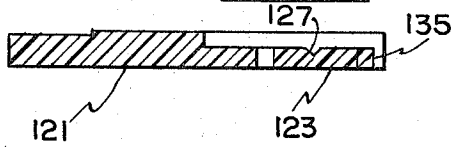


FIG. 13

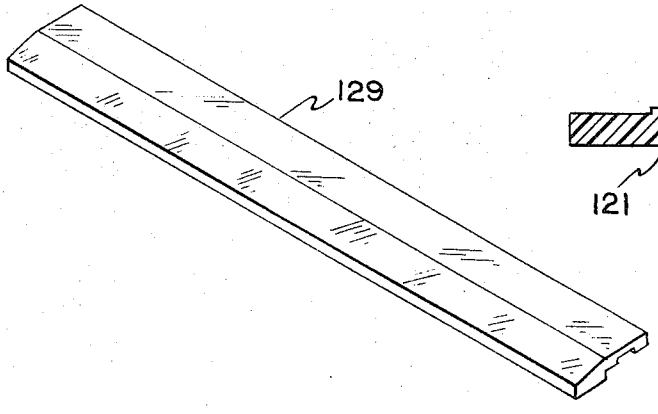


FIG. 12

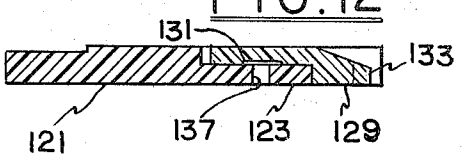


FIG. 19

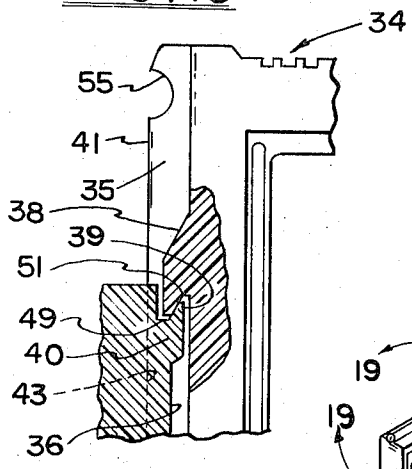
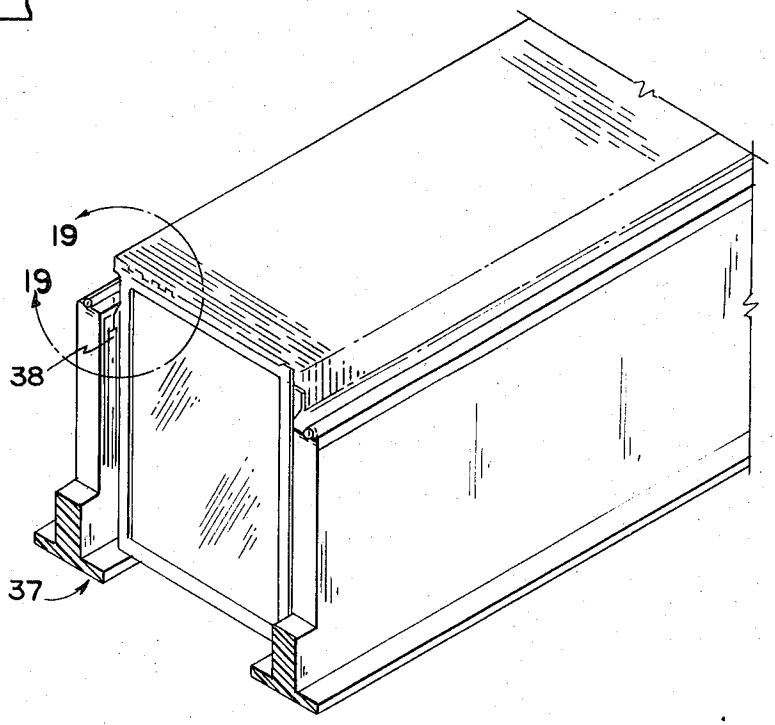


FIG. 18



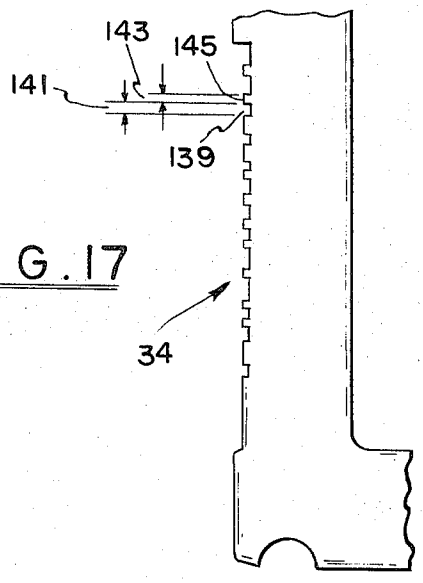


FIG. 17

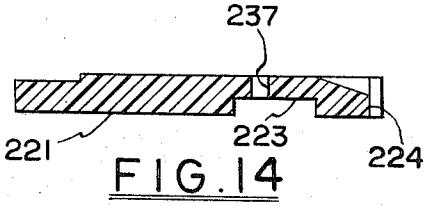


FIG. 14

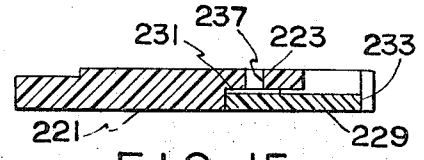


FIG. 15

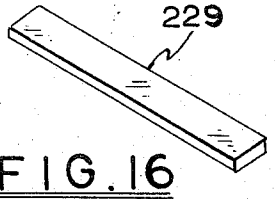


FIG. 16

MICROFICHE CARRIER

BACKGROUND OF THE INVENTION

Data information and retrieval systems have employed microfiche film supported on carriers for many years. In most cases the carriers themselves are coded to indicate the material contained on the attached microfiche. Many approaches to read that code have been utilized in the past but always requiring ultimate precision of the entire carrier and the reading equipment or alternatively requiring sophisticated code reading equipment which could accommodate variations in the position of the carrier in the bin. Moreover, the microfiche carriers in the past have been unsuitable for recoding or for reuse when the original microfiche was no longer needed.

SUMMARY OF THE INVENTION AND OBJECTS

The invention is incorporated in a combination of a hook and guide edge on the carrier itself which cooperates with the bin receiving the carrier. The coded information is precisely located with respect to the hook and edge whereby the only precision portion of the carrier necessary for reading the code are the edge and hook. Moreover, means are provided for reusing the carrier with a new code by simply removing the coded section of the carrier and replacing it with a new section to be coded.

In general it is an object of the present invention to provide an improved microfiche carrier.

It is a more particular object of the present invention to provide a microfiche carrier wherein the precision location of the code can be confined to one relatively small area of the total carrier.

It is another object of the invention to provide an improved microfiche carrier wherein the coded portion thereof may be easily replaced.

It is still another object of the invention to provide an improved microfiche carrier which is easily placed into slots in a storage bin.

BRIEF DESCRIPTION OF THE DRAWING

FIG. 1 is a top plan view of a microfiche carrier incorporating the invention;

FIG. 2 is a bottom plan view of the carrier shown in FIG. 1;

FIG. 3 is a detailed perspective view taken generally along the lines 3—3 of FIG. 1;

FIG. 4 is a detailed perspective view taken generally along the lines 4—4 of FIG. 1;

FIG. 5 is a detailed perspective view taken generally along the lines 5—5 of FIG. 1;

FIG. 6 is a detailed sectional view taken along the lines 6—6 of FIG. 1;

FIG. 7 is a detailed sectional view taken along the lines 7—7 of FIG. 1;

FIG. 8 is a detailed sectional view taken along the lines 8—8 of FIG. 2;

FIG. 9 is a detailed perspective view taken generally along the lines 9—9 of FIG. 1;

FIG. 10 is a broken plan view similar to FIG. 1 but showing an alternative preferred embodiment of the invention which accommodates a removable code strip;

FIG. 11 is a detailed sectional view taken along the lines 11—11 of FIG. 10;

FIG. 12 is a view similar to FIG. 11 but showing a removable code strip in place;

FIG. 13 is a perspective view of the removable code strip shown in FIG. 12;

FIG. 14 is a detailed sectional view similar to FIG. 11 but showing another alternative embodiment of the invention;

FIG. 15 is a detailed sectional view similar to FIG. 12 but showing the alternative embodiment of FIG. 14;

FIG. 16 is a perspective view of the removable code strip shown in FIGS. 14 and 15;

FIG. 17 is an enlarged detail view of the area shown generally in the lines 14—14 of FIG. 1;

FIG. 18 is a perspective view of a microfiche carrier in accordance with the invention shown in place in a system storage bin; and

FIG. 19 is a detailed sectional view of the area shown generally in the lines 16—16 of FIG. 15.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

The microfiche carrier shown in FIGS. 1 through 9 is generally in the form of a frame having opposed end members 21 and 23 and opposed side members 25 and 27 joined thereto. The frame defines an opening 29 in which is located a microfiche film (not shown) to be stored and retrieved. The microfiche is secured in the carrier by means of double sided adhesive strips 31 carried in recesses 33. As noted in FIG. 7, the strip 31 does not extend above the remainder of the member 27. This permits easy stacking of the carrier prior to mounting the microfiche. To assure this, some form of differential adhesion is employed. The adhesion strength of the strip may be formulated such that it has approximately three times the adhesion strength on the side contacting the recess 33 as compared to the side facing the film.

As can be seen in FIG. 1 the carrier is symmetrical end for end. Thus, in its first use coding information may be placed on the member 21 as at 34. When the carrier is reused the coding information 34 may be obliterated and new coding information placed at the opposite end of the carrier on the member 23. As will be seen hereinafter additional means may be provided to permit still additional coding changes to be made.

Referring particularly to FIGS. 1, 9, 15 and 16 it is seen that the member 27 includes a reduced portion 35 which cooperates with a slot 36 in the bin 37 for receiving the carrier. Overlying the reduced portion 35 is a hook 38 formed as an extension of the full thickness of the member 27. The inside surface 39 of the hook cooperates with a hook 40 on the bin 37 to cam the guide edge 41 of the carrier horizontally against the back wall 43 of the bin slot 36. The location of the hook 38 near the coded information 34 reduces the tolerance build up between the code edge and the storage bin. Thus, the coded information 34 need be precisely located only with respect to the edge 41 and the hook 38. Dimensional variations in the remainder of the carrier have little or no effect on accurately positioning the coded information with respect to the bin.

The male and female portions of the hook 38 are truncated or flattened as at 45 and 47. These truncated portions cooperate with similarly truncated portions 49 and 51 on the hook 40 to provide limits of vertical tolerance for positioning the carrier within the bins. Ordinarily the vertical position of the carrier, as predeter-

mined by the inclined edges of the hooks **38** and **40** and the location of the guide edge **41** against the back of the slot **43,** is within the normal machine tolerances. With wear, however, such vertical positioning may be inadequate and in these instances the abuttments provided by the truncated ends of the hooks limit the vertical movement.

The carrier in FIGS. **1** through **9** further includes corner notches **55** which are used for precisely registering the carrier in various apparatus within the system other than the code reading apparatus. An additional notch **57** is used to sense the orientation of the carrier, that is, whether the coding information is on the member **21** or **23.** When the carrier is reused such that coded information is placed on the member **23** rather than the member **21** partial notches **59,** shown in FIGS. **1, 4** and **5,** are punched completely through so that the system will recognize the new orientation required.

Recesses **61** placed in the back of the carrier serve as grasping surfaces for insertion and retraction of the carrier to and from various mechanisms in the system.

Referring to FIGS. **1** and **7,** spherical bosses **63** are carried on the reduced thickness portions **35** of the members **25** and **27.** As mentioned hereinabove, the reduced thickness portions **35** are received by the slots **36** in the bins **37.** The bin slots are slightly wider than the thickness of the reduced portion **35** but are somewhat less in width than the combination of the reduced portion **35** and the boss **63.** These bosses then cause the carrier to register along one side of the slots so that every carrier in the bin is pushed in the same direction thus reducing position variation between carriers. The use of the bosses **63** permit a secure fit in the slots but because of their slight frictional contact they still allow easy insertion and extraction. To further implement insertion of the carrier into bins, as well as into other apparatus, the leading edges of reduced portions **35** are tapered in two planes. The taper in one plane is at **65** shown in FIGS. **1, 2** and **3** while the taper in the other plane is at **67** shown only in FIG. **3.**

Referring particularly to FIGS. **10** through **13** an alternative embodiment of the invention is shown whereby the reuseable nature of the carrier can be extended beyond the end for end rotation of that shown in FIGS. **1** through **9.** As seen particularly in FIG. **10** the end member **121** includes a reduced portion **123,** the outer margin of which carries coded information **125** in the form of notches and lands. The reduced portion further includes a V-shaped groove **127.** After the carrier has been used once the outer portion is removed by breaking along the V-notched groove **127.** After this outer margin portion has been removed a code strip **129,** such as shown in FIGS. **12** and **13,** is attached to the reduced portion **123** by means of a double sided tape **131.** Once attached the new code strip may itself be punched with a series of notches and lands to provide a new code.

When it is desired to use the carrier a third time the detachable code strip **129** may be removed by passing a pin through the strip removal openings **137** against the adhesive strip **131.** Both the adhesive strip and the code strip are thus lifted off. Thereafter an additional code strip may be applied in the same manner as defined hereinabove.

As will be seen from a comparison of FIGS. **11** and **12** the new code strip, as well as the original reduced portion **123** includes a code area **133** and **135,** respectively, which is much narrower than the overall thickness of the carrier member **121.** With such a reduced thickness, coded areas of adjacent carriers are well separated even when the carriers are stacked in the bin, as shown in FIG. **15.**

Still another embodiment of the invention is shown in FIGS. **14, 15** and **16.** In this embodiment the end members **221** also include a reduced portion **223,** as well as a reduced edge **224** which carries the coded information in the form of notches and lands. After the carrier has been used once the outer portion is removed by breaking along the outer edge of the reduced portion **223.** A removeable code strip **229,** as shown in FIGS. **15** and **16** is then attached by means of double sided tape **231.** Strip removal openings **237** may be employed in the same manner as the openings **137** of the previously described embodiment.

The code strip **229** has a thickness less than that of the member **221** so that when secured to the member **221** it provided a reduced portion code area **233.**

The feature of the strip removal openings **137** and **237** may also be applied to the removal of the microfiche film itself. While it may be desirable, as set forth above, to retain the double sided tape **31** while removing the microfiche, there are instances where it is desirable to replace the tape when the microfiche is changed. Such instances occur primarily when there are changes so frequent that the life of the tape is expended. Film removal openings may then be placed in the recessed areas **33** and used in the same manner as the opening **137** and **237.**

The coded information referred to herein is a binary code employing a series of notches and lands representing binary 0 and 1. As shown particularly in FIG. **17,** a notch **139** for a single binary digit has a width **141** slightly greater than the width **143** of a land **145.** This small difference in width serves to avoid reading errors which might be introduced by a very slightly displaced code edge. For instance, it may be assumed that the code is read by reflected light from the land areas to indicate a binary 1 as contrasted with the lack of any reflection from the notches indicating a binary 0. With the land areas being slightly smaller, even if the code edge is moved laterally (vertically as shown in FIG. **17**) no light will be reflected in an adjacent notched area. The same advantage exists even when the code is read by the presence of direct light passing through the notches to indicate one binary state as contrasted with the absence of light blocked by the lands or teeth.

Thus it is seen that an improved microfiche carrier has been provided whereby highly reliable code readings may be taken with relatively little requirement for precision dimensions of the entire carrier. Moreover, the carrier is easily adaptable for reuse and recoding with the same or different microfiche film attached thereto.

We claim:

1. A microfiche carrier comprising a rectangular frame having two opposed side members and two opposed end members joined thereto, one of said end members being adapted to receive coded information, one of said side members including an edge comprising guide means precisely located with respect to said coded information for abutting the side of a bin receiving the carrier and cooperating with the bin to support the carrier therein and to position it relative to said car-

rier, said last mentioned means comprising a hook on said one side member having an inclined surface cooperating with a corresponding hook on said bin to provide the support and to urge said edge against the side of the bin whereby code reading apparatus located with respect to the side of the bin is accurately positioned to said coded information.

2. A microfiche carrier as defined in claim **1** wherein said end member adapted to receive coded information includes an outer marginal portion of reduced thickness, said outer marginal portion being adapted to receive the coded information whereby the coded portion of adjacent carriers in a bin are separated from each other.

3. A microfiche carrier as defined in claim **2** wherein said outer marginal portion includes means for removing a portion thereof, the remainder of said outer marginal portion being adapted to receive a removable code strip.

4. A microfiche carrier as defined in claim **1** wherein said end member adapted to receive coded information includes an outer marginal portion of reduced thickness, a code strip removably secured to said portion of reduced thickness, the thickness of the code strip together with that of the portion of reduced thickness being no greater than the thickness of the remainder of said end member, said removable code strip itself including an outer marginal portion having a thickness less than that of said member and being adapted to receive coded information whereby the coded portions of adjacent carriers in a bin are separated from each other.

5. A microfiche carrier as defined in claim **4** wherein the outer marginal portion of said end member defines an opening therein in registry with said code strip whereby the code strip may be removed by passing a pin through the opening.

6. A microfiche carrier as defined in claim **1** wherein said side members include portions adapted to be received in slots of a bin receiving the carrier, said portions being of a thickness less than the thickness of the slots and including protuberances on one side thereof which, when added to said portions, provide a dimension greater than the thickness of the slot whereby the carriers register along one side of the slots of the bin to reduce position tolerance between carriers while still allowing easy insertion and extraction from the bin.

7. A microfiche carrier as defined in claim **6** wherein said portions adapted to be received in slots include leading edges tapered in two planes.

8. A microfiche carrier as defined in claim **1** wherein said frame defines an opening for receiving microfiche film, the inner portion of at least two of said opposed members defining recesses, adhesive strips secured in said recesses, the thickness of the adhesive strips together with the recessed portions being no greater than the thickness of the remainder of said members.

9. A microfiche carrier as defined in claim **1** wherein said one end member includes coded information in the form of a series of notches and lands indicating binary digits 0 and 1, the width of individual ones of said notches representing a single binary digit being greater than the width of individual ones of said lands representing a single binary digit, whereby the possibility of a code reading error from a land adjacent to a notch is substantially reduced.

10. A microfiche carrier comprising a rectangular frame having two opposed side members and two opposed end members joined thereto, one of said end members being adapted to receive coded information, a removable code strip attached to said one end member, said removable code strip including a first portion overlying said end member and secured thereto by adhesive and a second portion extending outward from said end member, said second portion being adapted to receive coded information.

11. In a microfiche carrier an elongated edge including coded information in the form of a series of notches and lands indicating binary digits 0 and 1, the width of individual ones of said notches representing a single binary digit being greater than the width of individual ones of said lands representing a single binary digit, whereby the possibility of a code reading error from a land adjacent to a notch is substantially reduced.

* * * * *