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A. L. BAPTIE

3,264,770

HOLDER FOR SHEET MICROFILM

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FIG. 1.

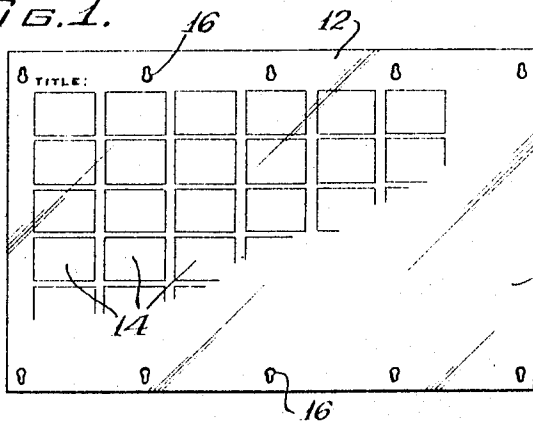


FIG. 3.

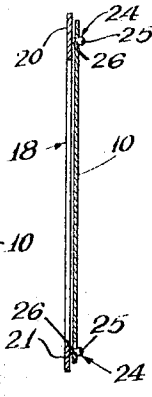


FIG. 4.

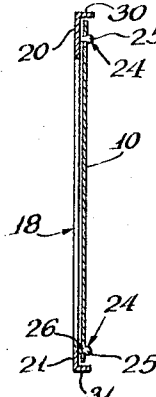


FIG. 2.

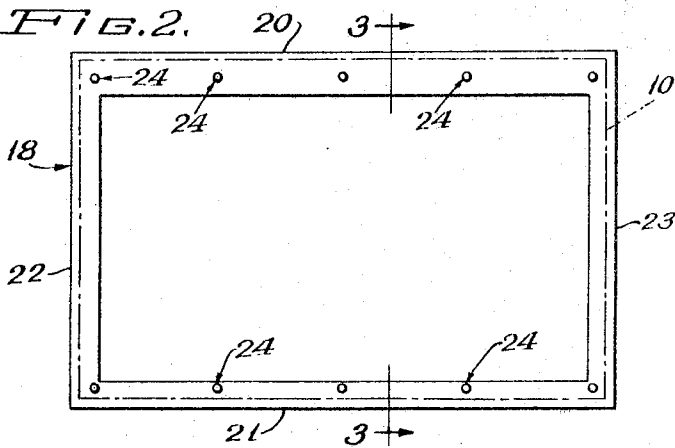


FIG. 5.

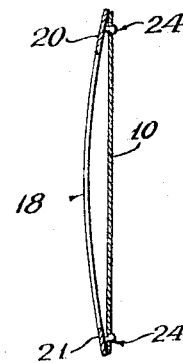


FIG. 6.

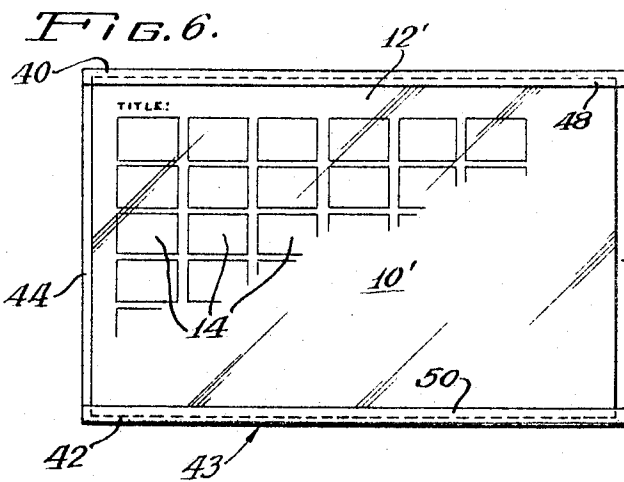


FIG. 7.

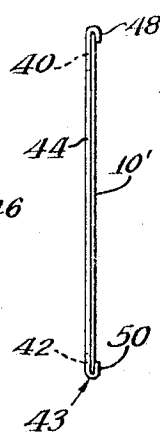
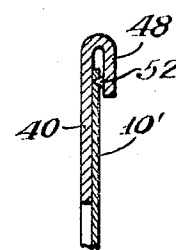


FIG. 8.



Inventor:
Alexander L. Baptie
By *Sair, Freeman & Molinare*
Attys.

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HOLDER FOR SHEET MICROFILM

Alexander L. Baptie, La Crosse, Wis., assignor to Micro-card Corporation, a corporation of Wisconsin
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 7 Claims. (Cl. 40-158)

This invention relates to a holder for sheet microfilm and, more particularly, to a holder for supporting a sheet of microfilm in a flat and tensioned condition on such support frame to facilitate handling of the sheet and to minimize damage and scratching of the surfaces of the sheet of microfilm.

The use of microphotography for information storage is increasing. One type of microphotographic reproduction in use is a film strip which is on the order of four inches by six inches and has exposed thereon a plurality of pages of copy in greatly reduced size. A single strip of film may contain forty to sixty pages from a book or magazine. This strip or sheet of microfilm, which is also referred to as a "fiche," is a relatively delicate product when compared with the usually stiff opaque cards on which microphotographs are frequently printed. While the microphotographic cards have a relatively longer life, it has been found that illustrations from a transparency or fiche may be reproduced better than from a microphotographic card. Thus, in many applications, use of a fiche is preferred.

The fiche, however, cannot be easily used for an extended time as it is subject to wear and tear during each use. The unprotected surfaces of the fiche may be scratched when the fiche is inserted into or removed from a microphotographic reader. Fingerprints resulting from handling of the fiche may reduce the readability of the images thereon. The fiche is further subject to scratching and damage when being removed and returned to an opaque envelope in which the fiche is commonly stored. Critical data is generally marked on the exterior of the envelope to inform the searcher of the contents. Thus, storing of the fiche has been a problem.

It has been proposed that fiches be enclosed in glass plates for better protection. This method has proved unsatisfactory for dirt can collect on any one of six surfaces (four on the glass plates and two on the fiche) thus reducing the effective reproducibility of the images. There is a tendency on the part of the searcher to handle the glass, again leaving fingerprints which reduce the clarity in reproduction. Further, when using glass covered fiches in a microphotographic reader, there is danger of overheating the fiche as there is no air movement over the surface of the fiche, thereby resulting in possible damage to the fiche.

A primary object of the present invention is to provide an annular open support for a flexible fiche which will keep the fiche in a flat and taut condition at all times, and thereby facilitate handling, use, and storage of such fiche.

Another object of the present invention is to provide a support for a flexible sheet of microfilm which will hold the microfilm in a flat and tensioned condition so as to permit the support to be inserted into a reading machine, enlarging machine, or other device in such manner that no glass, metal or other material will touch either the front or back surfaces of the microfilm, thereby preventing scratching or other damage to the microfilm.

It is a further object of the present invention to provide a novel holder for a relatively delicate sheet of microfilm which will facilitate handling of the sheet in use while minimizing possible damage thereto, such holder being fabricated inexpensively.

Further objects and advantages of the present invention will become apparent as the following description

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proceeds and the features of novelty which characterize the invention will be pointed out with particularity in the claims annexed to and forming a part of this specification.

A preferred embodiment of the invention is shown in the accompanying drawings, in which like numerals refer to like elements, and in which:

FIGURE 1 is a front elevation view of a fiche which may be utilized with the holder of this invention;

FIGURE 2 is a plan view of a fiche holder of the present invention with a fiche being indicated in broken line;

FIGURE 3 is a cross-sectional view of the holder taken generally along the line 3-3 of FIGURE 2 and showing a fiche carried on the holder;

FIGURE 4 is a cross-sectional view of the holder similar to FIGURE 3 and illustrating a modified construction of the opposed side members of the holder whereby spacer means are provided for additional protection of the fiche;

FIGURE 5 is a cross-sectional view illustrating the manner of affixing a fiche to a pin member protruding from the frame of the preferred holder, with the deflection of the frame being exaggerated for clarity;

FIGURE 6 is a plan view of a modified holder wherein means are provided on opposed sides of the holder for crimping a fiche to the holder;

FIGURE 7 is an end view of the modified holder shown in FIGURE 6; and

FIGURE 8 is a detail view on an enlarged scale illustrating the means for affixing a fiche to an opposed side of the modified holder of FIGURE 6.

Referring now to the drawings, there is illustrated in FIGURE 1 a generally rectangular fiche or sheet of microfilm 10 upon which is reproduced a plurality of microphotographs. Illustratively, the fiche is three by five inches or four by six inches. An upper elongated border portion 12 may be provided on the fiche 10. This border portion constitutes a title area upon which title indicia or other informational data may be printed in legible size characters. The central portion of the facing side of the fiche of FIGURE 1 has a plurality of microphotographs 14 printed thereon, as is indicated by the plurality of rectangular areas.

Provided along two opposed edges of the fiche 10 are a plurality of openings 16, such openings being spaced along the length of the fiche. Though openings 16 are illustrated as key-shaped slots, it will be understood that slots elongated lengthwise of the fiche or openings having other shapes may be formed adjacent opposed edges of the fiche. The most important considerations concerning the orientation of openings 16 and pins 24 are (1) that the openings be spaced along the fiche the same distance apart as the pins 24, (2) the openings be at least as large and perhaps somewhat larger than the maximum diameter or width of the pins to prevent tearing of the fiche about the openings and to facilitate mounting of the fiche on the pins, and (3) the minimum distance between openings 16 on opposed sides of fiche 10 must be less than the spacing between associated pins on the sides of frame 18 in order to tension a fiche after it has been mounted on a holder or frame.

Referring now to FIGURE 3, there is illustrated a preferred holder or support for supporting the fiche shown in FIGURE 1. The holder comprises a generally annular rectangular frame means 18 having a first pair of opposed sides 20 and 21 and a second pair of sides 22 and 23 for connecting the sides 20 and 21. The frame means 18 is generally planar and may be formed from a single sheet of metal or like substantially rigid material. Extending outwardly substantially at right angles from the opposed sides 20 and 21 of the frame 18 are means

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for holding a fiche on the frame comprising a plurality of pins 24 which are spaced along the length of the sides and are spaced from one another in a manner corresponding to the spacing of the openings 16 in the fiche 10.

It will be noted in FIGURE 3 that each pin 24 may be provided with an enlarged head 25 and a recessed portion 26 for engaging the openings in the fiche and retaining the fiche in taut and tensioned condition on the frame. The free ends or enlarged heads 25 of the pins 24 extend beyond the surface of the fiche 18 so that when holders or frames 18 are stored adjacent one another, the pins will space adjacent holders from one another and thereby further protect the surface of the fiche 10.

Referring to FIGURE 4, there is illustrated a modified holder for further protecting the ends of the fiche. The sides 20 and 21 of the holder may be formed from angle members or may be angle shaped in cross section. The sides 20 and 21 of the modified frame include upstanding legs 30 and 31 which extend outwardly from the plane of the frame 18. The upstanding legs will function as spacer means to protect the surfaces of the fiche during storage when the holders are stacked adjacent to one another and also to prevent damage to the ends of the fiche.

In FIGURE 5, there is shown one manner of affixing a fiche in place on a frame 18. By virtue of the resiliency and yieldable nature of frame 18, and particularly the connecting members 22 and 23, it will be apparent that the connecting members 22 and 23 may be bowed and the side members 20 and 21 of the frame moved toward one another to align the pins or lugs 24 with the openings 16 in the fiche 10. Upon release of the force urging the side members 20 and 21 toward one another to permit alignment of the pins 24 with the openings 16 in the fiche, the inherent resiliency of the side connecting members 22 and 23 will tend to move the members 20 and 21 from one another, thereby tensioning the fiche 10 and holding the fiche taut and flat on the holder 18. The frame 18 may be constructed to accommodate bending thereof about diagonally opposed corners to permit alignment of the pins 24 with the openings in the fiche. Similarly, upon release of the frame after alignment of lugs 24 with openings 16, the frame will tend to restore itself to its initial planar state, thereby tensioning the fiche. The fiche holder is reusable to support other fiches.

The frame or holder 18 extends beyond the edges of the fiche, thereby protecting the fiche and facilitating handling and storage of a fiche with a minimum of wear and tear. Furthermore, the operator may handle the holder and need not touch the fiche, thereby no fingerprints might interfere with reading of the fiche will appear on the fiche.

Referring to FIGURES 6, 7 and 8, there is illustrated a modification of the fiche holder of the present invention. The fiche holder 43 comprises a generally rectangular frame having a pair of side members 40 and 42 interconnected by side connecting members 44 and 46. The fiche 10' is retained in the film holder by means of the outer portions or ends 48 and 50 of the side members 40 and 42 of holder 43 being bent over the film and crimped thereto to hold the fiche in place.

In normal assembly of a fiche to the holder, one end of a side, as for example, the end 50, will be crimped to hold the fiche. The connecting side members 44 and 46 may then be bowed or bent (similar to the manner indicated in FIGURE 5) to permit tension to be applied to the fiche 10' when the side 48 is crimped in place. Ordinarily, the frame or holder may be bent or bowed manually to permit appropriate tensioned mounting of the fiche on the supporting frame structure.

It will be understood that a plurality of projections may be spaced along each of the ends 48 and 50 to provide means for better securing an edge of the fiche in place on the frame. The protrusions or projections 52

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may be stamped from the material of the sides 40 and 42 or may be otherwise suitably affixed to the sides 40 and 42 or to the ends 48 and 50.

By use of the holder of the present invention, the fiche may be inserted into a reading machine in such a manner that no glass, metal, or other material will touch the front or back surfaces of the fiche. This is extremely important as the fiche is readily susceptible to scratching. Further, by holding the fiche taut in the holder, it will remain in focus in the reading machine with no mechanical pressure plate or other apparatus being required.

When a fiche is retained in the holder of the present invention, there are only two surfaces, the front and the back surface of the fiche, which collect dirt, grit or other undesirable matter. In previous constructions wherein glass plates were utilized to hold the fiche, there would be at least six surfaces that would collect dirt, grit, etc., that is four surfaces on the glass plate and two on the fiche. The holder of the present invention reduces the dirt catching surfaces to two and thereby minimizes the likelihood of dirt interfering with the reading of the fiche.

The fiche holder is designed to provide a modest but continuous spring tension to hold the fiche taut and flat at all times. By virtue of this inherent resiliency and flexibility, the holder will accommodate the minute changes in fiche size brought about by variations in temperature, humidity and general aging of the fiche.

The fiche holder of the present invention suspends the fiche in open air and thereby the danger of overheating of the fiche in a reading machine is greatly minimized for air currents may pass directly over the surface of the fiche and there is no glass or other interfering media to restrict convection.

With respect to the reusable fiche holder disclosed in FIGURES 1-5, the camera used to film the fiche would have register marks that would photograph on the film in exactly the same relative position every time. By use of these register marks, the alignment holes or openings in the fiche could be accurately located and thereby the fiche could be affixed to a holder in an accurate predetermined relationship.

While there have been shown and described preferred embodiments of this invention, it will be obvious to those skilled in the art that various changes and modifications may be made therein without departing from the invention, and therefore, it is intended in the appended claims to cover all such changes and modifications as fall within the true spirit and scope of the invention.

What I claim as new and desire to secure by Letters Patent of the United States is:

1. A support for protecting a flexible fiche having a front, information-carrying surface and a back surface, said support comprising frame means having opposed side members and resilient, opposed connecting members interconnecting said opposed side members and being bendable from an untensioned planar disposition to move the opposed side members toward one another, and means on each of said opposed side members for securing an adjacent edge of said fiche to said side members when said side members have been moved toward one another, whereby upon release of the side members, the connecting members of the frame means will move toward their planar position to hold the flexible fiche taut and in tension.

2. A support as in claim 1 wherein the securing means comprises at least one member on each of said opposed side members crimped over an edge of said fiche.

3. A support as in claim 1 wherein said securing means comprise a plurality of pins projecting generally in the same direction from said opposed side members, said pins being adapted to engage in openings in said fiche adjacent the peripheral opposed edges thereof, the spacing between openings adjacent opposed edges of the fiche being less than the distance between the pins projecting from the opposed side members when the interconnecting side members are untensioned.

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4. A support as in claim 1 including means on at least two sides of said frame means projecting from the frame means to provide a spacer between adjacent stored supports, whereby damage to the surfaces of the fiche is minimized.

5. A support for a sheet of microfilm having a plurality of aligned openings along opposed edges, the openings along one edge being spaced a predetermined distance from the openings on the other edge, said support comprising an annular frame member including a pair of opposed sides movable toward and away from one another, and a plurality of protrusions spaced along said sides of said frame member and adapted to engage in said openings in said sheet of microfilm, said opposed sides being movable toward one another to align said protrusions with said openings and being movable away from one another to enable said protrusions to hold said sheet of microfilm on said frame member, said protrusions on one side being spaced from the protrusions on the other side a distance greater than said predetermined distance between openings along opposed edges of the microfilm so as to tension the microfilm and maintain it taut on the support during use.

6. A holder for a fiche having a plurality of aligned key-shaped openings along each side, the openings along one side being spaced a predetermined distance from the openings along the opposed side, said holder comprising a unitary, planar generally rectangular frame having a first pair of opposed sides and a second pair of resilient, yieldable opposed sides, said frame being constructed and arranged to return to its planar disposition when the second sides are bent therefrom, each of said first pair of sides having a plurality of headed pins extending therefrom and adapted to engage in openings in the fiche, the

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distance between the pins on the opposed first sides being greater than said predetermined distance between openings in the fiche, the frame being yieldable to align the pins on said first pair of sides with the openings in the fiche, the heads of the pins extending into the openings in the fiche, whereby upon release of said frame, the frame will tend to return to its planar disposition and the pins will engage the fiche to hold it taut upon the frame.

7. A holder for a fiche having a plurality of openings spaced along opposed edges thereof with the openings along one edge being spaced a predetermined distance from the openings along the other edge, said holder comprising a unitary frame including a pair of parallel opposed sides having pin means projecting therefrom and resilient connecting side members affixed to said opposed sides, the distance between pin means on the opposed sides being greater than said predetermined distance between openings in the fiche, said connecting side members being yieldable from an untensioned condition to permit said pin means on said opposed sides to be aligned with said openings in said fiche, whereby when said frame is released, said fiche is tensioned and held taut on said frame.

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EUGENE R. CAPOZIO, Primary Examiner.

WENCSEL J. CONTRERAS, Assistant Examiner.