United States Patent [19]

Smitzer et al.

[11] **3,829,215**

[45] **Aug. 13, 1974**

[54] **FLASH COPIER**

[75] Inventors: **Louis A. Smitzer,** San Diego; **Jurgen Amtmann,** Del Mar, both of Calif.

[73] Assignee: **Ovonic Image Systems, Inc.,** San Diego, Calif.

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

[21] Appl. No.: **251,022**

[52] **U.S. Cl.** **355/113,** 355/120

[51] **Int. Cl.** **G03b 27/04**

[58] **Field of Search** 355/113, 114, 115, 116, 355/117, 118, 119, 120

[56] **References Cited**

UNITED STATES PATENTS

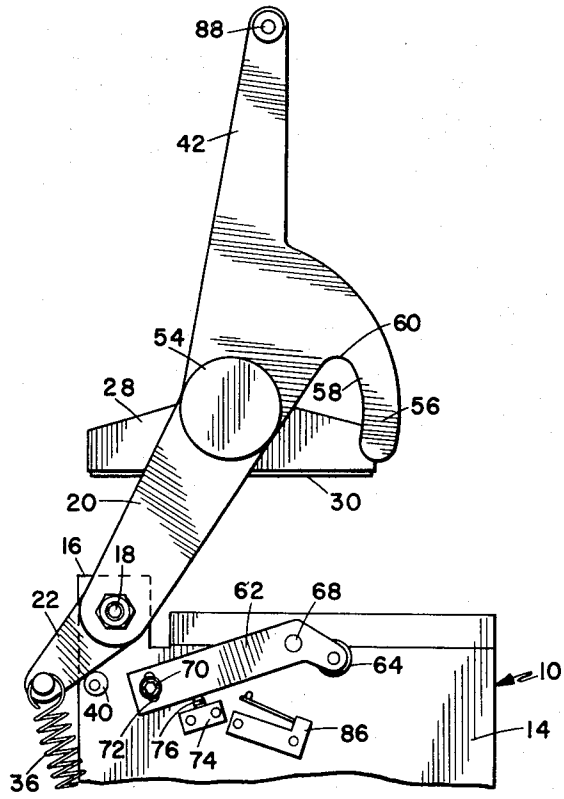
1,383,893	7/1921	Winkler	355/115
1,426,117	8/1922	Smith	355/113
1,521,399	12/1924	Sharp	355/115
1,533,583	4/1925	Bracy	355/115
1,602,051	10/1926	Sharp	355/115
1,635,618	7/1927	Hammond	355/113
1,666,052	4/1928	Chamberlin	355/120
1,831,248	11/1931	Hopkins	355/119
2,224,839	12/1940	Steiner	355/118
2,299,990	10/1942	Jones	355/120
2,375,491	5/1945	Perry	355/113 X
2,706,436	4/1955	Scott et al	355/113
3,642,376	2/1972	Halvorsen	355/115 X

Primary Examiner—Samuel S. Matthews
Assistant Examiner—Alan Mathews
Attorney, Agent, or Firm—Brown & Martin

[57] **ABSTRACT**

A flash copier for making duplicate copies of microfiche cards or the like by a contact printing technique. The unit has a housing containing a high intensity flash lamp to illuminate a window on which the original transparency and a sensitized card or film are placed. A platen mounted on a double hinged arm assembly is lowered onto the window and clamped by cam action in a continuous motion. Clamping pressure is closely adjustable to ensure high definition of copy, and the flash lamp is controlled by a switch which is actuated only at the locked position of the clamping cam mechanism.

1 Claim, 5 Drawing Figures



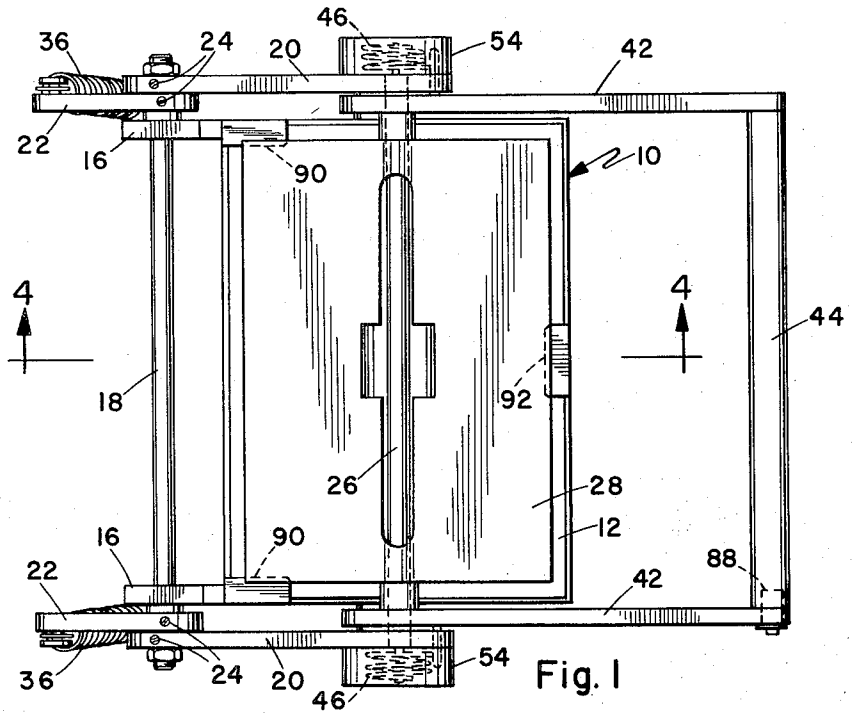

46
36
24
20
54
42
22
16
90
10
4
4
44
18
92
26
28
12
16
90
88
22
42
36
24
20
54
46

Fig. 1

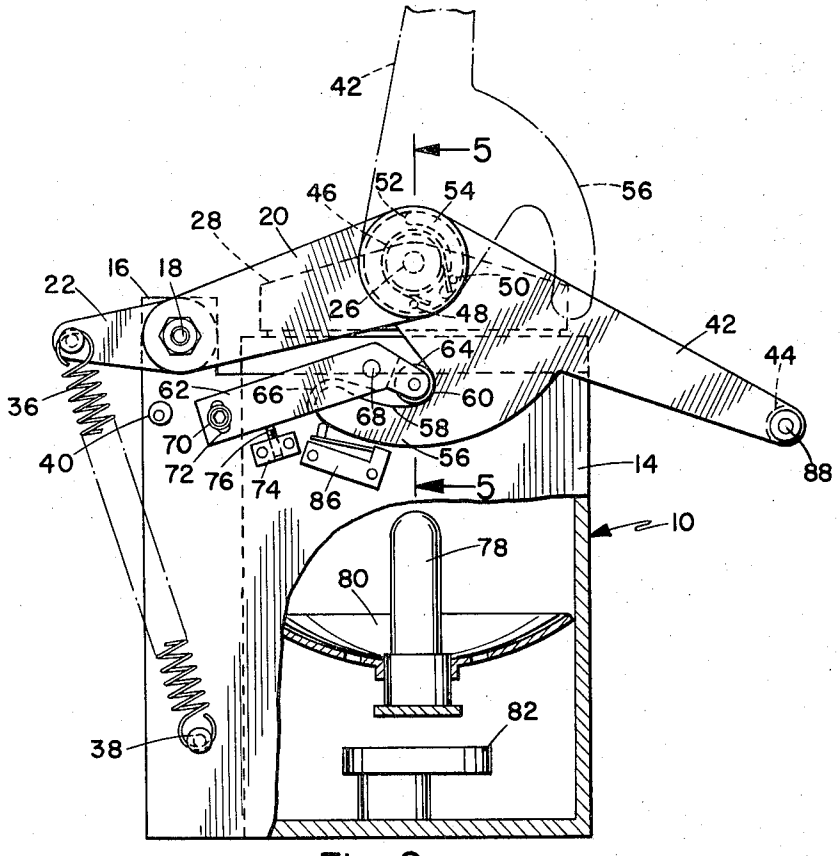

42
5
56
46
52
54
28
20
16
18
22
50
26
48
42
44
64
62
66
60
36
68
58
70
56
40
72
76
74
86
14
88
5
10
78
80
82
38

Fig. 2

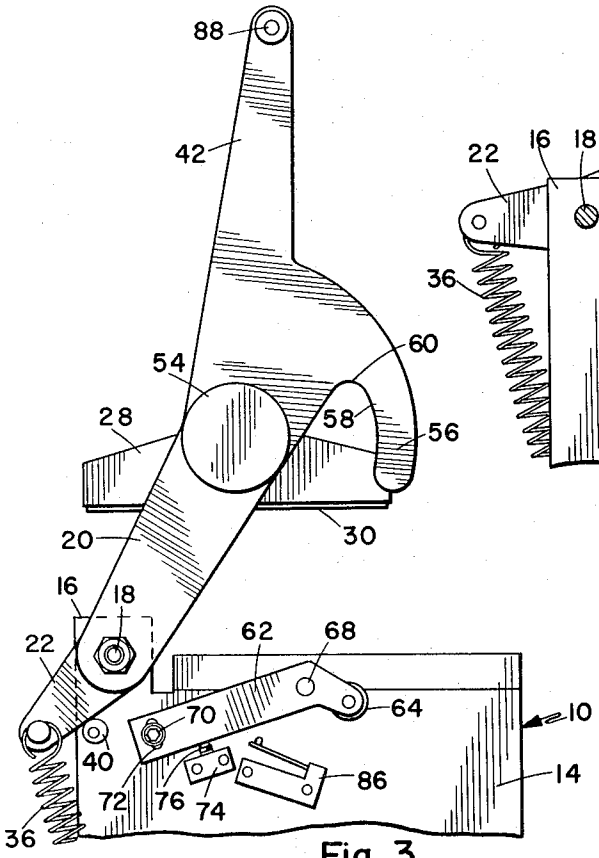


Fig. 3

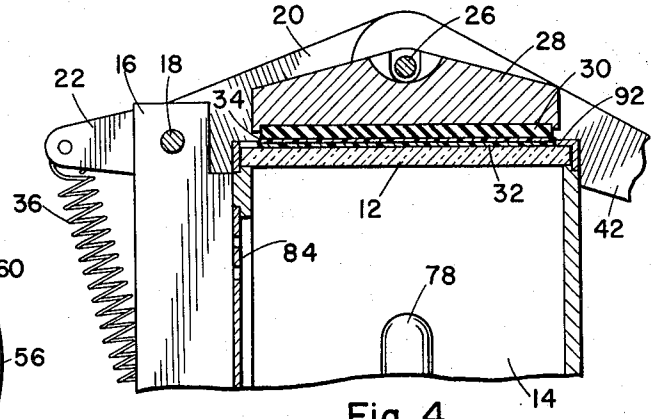


Fig. 4

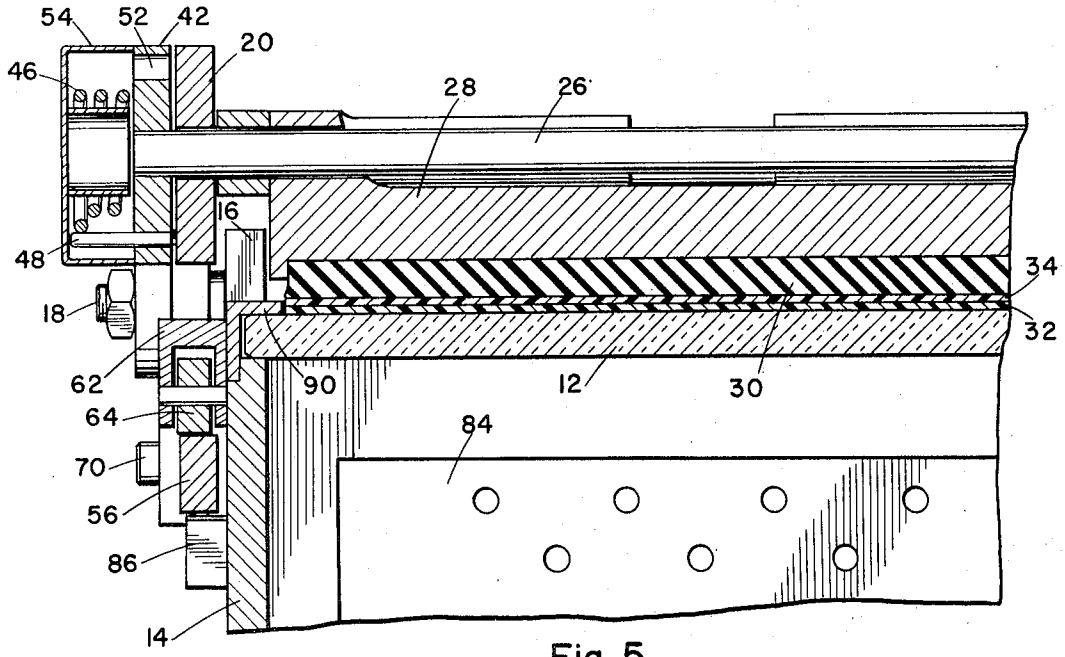


Fig. 5

FLASH COPIER

BACKGROUND OF THE INVENTION

In the storage of information in microfiche form, many pages of printed or pictorial data are contained on a single microfiche card as a transparency, for subsequent viewing by magnified projection. Image definition must be extremely high, since the characters or elements in the fiche are microscopic. It is often necessary to reproduce copies of microfiche cards and the definition must be maintained. This requires precise registration of the original microfiche and the copy film, with firm overall pressure during the exposure. Conventional contact printing apparatus is not suitable for such precision, and special frames with multiple clamps make the process very slow. It would be very advantageous to be able to make high definition microfiche copies quickly, without elaborate set up procedures and complex equipment.

SUMMARY OF THE INVENTION

The flash copier described herein is a compact, fully portable unit, with which a precise microfiche copy can be set up and exposed in a few seconds. The unit is constructed on a housing containing a high intensity flash lamp, positioned to illuminate a window set into the top of the housing. An original microfiche card and the copy film are placed on the window and aligned between guides. Clamping pressure is applied by a platen which is mounted on a counterbalanced hinged arm assembly, provided with a handle to facilitate one handed operation. The handle is also hinged at the platen and has cam elements which clamp and lock the platen by continued downward motion of the handle after the platen is set in place. Adjustment means is provided for precise control of the clamping pressure. To avoid inadvertent operation of the flash lamp, a controlling switch is actuated by the clamping cam mechanism at the locked position. A further switch may be incorporated in the handle for actuation of the flash by the operator.

The primary object of this invention, therefore, is to provide a new and improved flash copier.

Another object of this invention is provide a new and improved flash copier in which the original and copy film are securely clamped in exposure position by a one handed operation.

Another object of this invention is to provide a new and improved flash copier having positive clamp and lock mechanism with an interlocked flash control switch.

Another object of this invention is to provide a new and improved flash copier which is compact, portable and simple in construction.

Other objects and many advantages of this invention will become apparent upon a reading of the following detailed description and an examination of the drawings, wherein like reference numerals designate like parts throughout, and in which:

FIG. **1** is a top plan view of the complete flash copier.

FIG. **2** is a side elevation view, with the platen clamped and locked.

FIG. **3** is a partial side elevation view with the platen raised.

FIG. **4** is a sectional view taken on line **4—4** of FIG. **1.**

FIG. **5** is an enlarged sectional view taken on line **5—5** of FIG. .

DESCRIPTION OF THE PREFERRED EMBODIMENT

The copier unit is constructed on a box housing **10,** having a rigid transparent exposure window **12** inset into the top. Sides **14** of the housing **10** have extensions **16** projecting rearwardly and upwardly to provide bearings for a hinge rod **18** supported adjacent and parallel to the upper rear edge of the housing. On each end of the hinge rod **18** is a support arm **20,** with a short counterbalance arm **22** extending in the opposite direction, both pairs of arms being fixed to the hinge rod by lock screws **24,** or similar means. Support arms **20** extend parallel to each other outside housing **10,** and secured between the arms is a bearing rod **26.**

Pivotally suspended from bearing rod **26** is a platen **28,** which is a rigid block of material having a firm resilient pad **30** inset in the lower face. When support arms **20** are swung downwardly, platen **28** fits on top of window **12,** with the pad **30** positioned to hold a microfiche original **32** and copy film **34** sandwiched on top of the window. Platen **28** is biased to a raised position by counterbalance springs **36,** connected between the outer ends of arms **22** and anchor pins **38** adjacent the lower ends of sides **14.** Stop pins **40** are fixed in extensions **16** and engage counterbalance arms **22** to limit the upward travel of the platen.

To secure the platen in place, clamp arms **42** are pivotally mounted on bearing rod **26** inwardly of support arms **20,** the clamp arms being spaced to pass closely on opposite sides of housing **10.** The outer ends of clamp arms **42** are connected by a handle bar **44** for simultaneous operation. Closing and locking of the platen in two stages is facilitated by interconnecting each support arm **20** and adjacent clamp arm **42** by a torsion spring **46,** one end of which engages a pin **48** fixed in the support arm. The other end of the torsion spring engages a pin **50** fixed in clamp arm **42** and passing through an arcuate slot **52** in the support arm. Each torsion spring is enclosed by a suitable cover **54.**

Each clamp arm **42** has a downwardly extending, substantially arcuate cam finger **56** having an inner cam face **58** leading into a closed end socket **60.** On each side **14** is a bracket **62** carrying a roller **64** under which cam finger **56** passes, the cam face **58** decreasing slightly in radius toward the closed end of socket **60,** so that the cam locks securely when the roller seats in the end of the socket, as in full line in FIG. **2.** As illustrated, the bracket **62** has a clearance cavity **66** to receive the end of the cam finger in locked position. To provide for adjustment of clamping pressure, bracket **62** is mounted on a pivot pin **68** adjacent the roller **64,** and is secured at the other end by a lock screw **70** passing through a slot **72** in the bracket. Below the bracket is a small block **74** fixed to side **14,** and threaded through the block is a fine adjustment screw **76** which engages the bracket. The screw **76** is used to adjust the roller **64** precisely for the required clamping pressure by the cam, and bracket **62** is locked in place by lock screw **70.**

Inside housing **10** is a high intensity flash lamp **78,** with a reflector **80** positioned to illuminate window **12** evenly. The power supply for operating the flash lamp

is conventional and may be incorporated in the unit or used as a separate element. A cooling fan **82** is mounted in the housing, which has a removable perforated back panel **84** for venilation and access.

To prevent the flash lamp **78** from being fired before the apparatus is ready, a switch **86** is mounted on one side **14** to be actuated by the end of cam finger **56** in the locked position. Switch **86** may be used to operate the flash lamp as the clamp mechanism reaches the locked position, or may be used as a safety interlock. In the latter instance, an operator controlled flash switch **88** would be mounted in one end of handle bar **44,** for one hand operation of the platen and exposure action.

In copying microfiche cards of a standard size, positioning of the original **32** and copy film **34** on window **12** is facilitated by positioning tabs **90** at opposite ends and a tab **92** at the front. The tabs project inwardly over the top surface of window **12** and are of sufficient thickness to engage the two layers of film, as in FIG. **5,** without interfering with the even pressure applied by pad **30.**

Operation of the unit is very simple and begins with the platen and its supports in the upwardly biased open position illustrated in FIG. **3.** The microfiche original **32** and copy film **34** are placed in position on window **12** and platen **28** is pulled down by grasping handle bar **44.** Platen **28** is seated with clamp arms **42** still raised, as in the broken line position in FIG. **2.** Continued pulling down on handle bar **44** overcomes torsion springs **46** and swings the cam fingers **56** down under the rollers **64** to the locked position. Even face to face contact between the film elements **32** and **34** is thus maintained while the flash lamp is fired to make the exposure. Handle bar **44** is then lifted to first unlock the cams and then lift the platen, so that the exposed film **34** can be removed for developing.

The entire operation takes only a few seconds and very little training is necessary for an operator to make good copies. The unit is equally suitable for making single copies or continuous operation for large numbers of copies.

Having described our invention, we now claim:

1. A flash copier, comprising:

a housing having an exposure window mounted therein;

a flash lamp in said housing directed to illuminate said window;

a platen having a resilient pad for holding film material on said window;

a pair of support arms pivotally mounted at one end on said housing and extending on opposite sides thereof, the support arms being interconnected at the pivoted ends;

said platen being pivotally suspended between the other ends of said support arms;

a pair of clamp arms pivotally connected to said support arms on a common axis with pivotal attachment of said platen, and spaced to pass on opposite sides of said housing;

a handle interconnecting said clamp arms;

said support arms being biased to raise said platen clear of the window, and said clamp arms being biased upwardly from the support arms;

said clamp arms having cam fingers extending therefrom;

cam receiving rollers rotatably mounted on said housing;

said cam fingers having closed end sockets into which said rollers seat in the locked position of the clamp arms.

* * * * *