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Epperson et al.

[11] **3,802,983**

[45] **Apr. 9, 1974**

[54] **METHOD FOR SECURING TOGETHER PHOTOGRAPHIC MATERIAL AND A TAB**

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[73] Assignee: **Eastman Kodak Company**, Rochester, N.Y.

[22] Filed: **Feb. 24, 1972**

[21] Appl. No.: **228,937**

[52] **U.S. Cl.** **156/157**, 156/159, 156/320, 156/325, 156/499, 156/502, 156/578

[51] **Int. Cl.** **B65h 19/00**

[58] **Field of Search** 156/157, 159, 320, 325, 156/502, 544, 552, 578, 499

[56] **References Cited**

UNITED STATES PATENTS

3,340,130	9/1967	Dunn et al.	156/552
2,808,871	10/1957	Brown	156/556
2,335,033	11/1943	Tompkins	156/547 X
3,516,890	6/1970	Gallistel et al.	156/530 X

Primary Examiner—William A. Powell

[57] **ABSTRACT**

A photographic material tabbing apparatus and method, by which a tab and the emulsion-bearing surface of photographic material are positioned in partially overlapping relation so as to interface portions respectively of the tab and the emulsion-bearing surface. The emulsion-bearing surface portion, interfaced with the tab portion, is softened in a manner causing the photographic emulsion to become adhesive. Thus, upon pressing together the interfaced portions of the softened emulsion-bearing surface and the tab, the adhesive emulsion will effect a bond between the tab and the photographic material.

8 Claims, 11 Drawing Figures

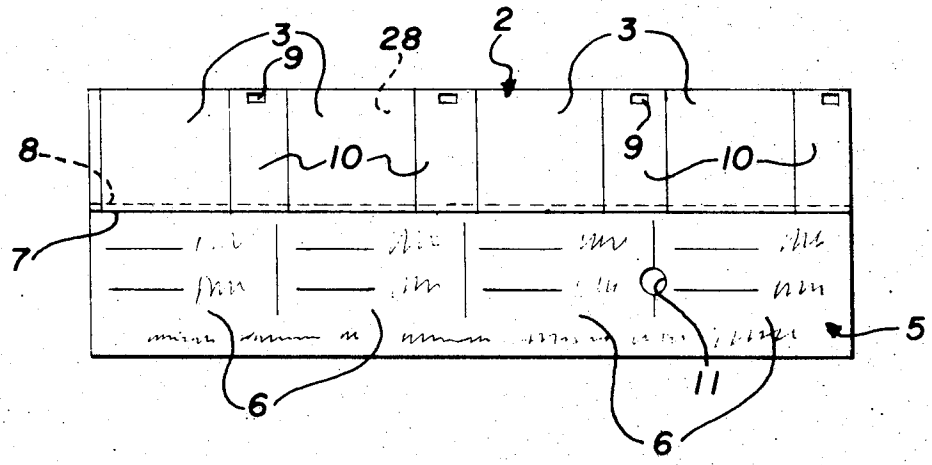


FIG. 1

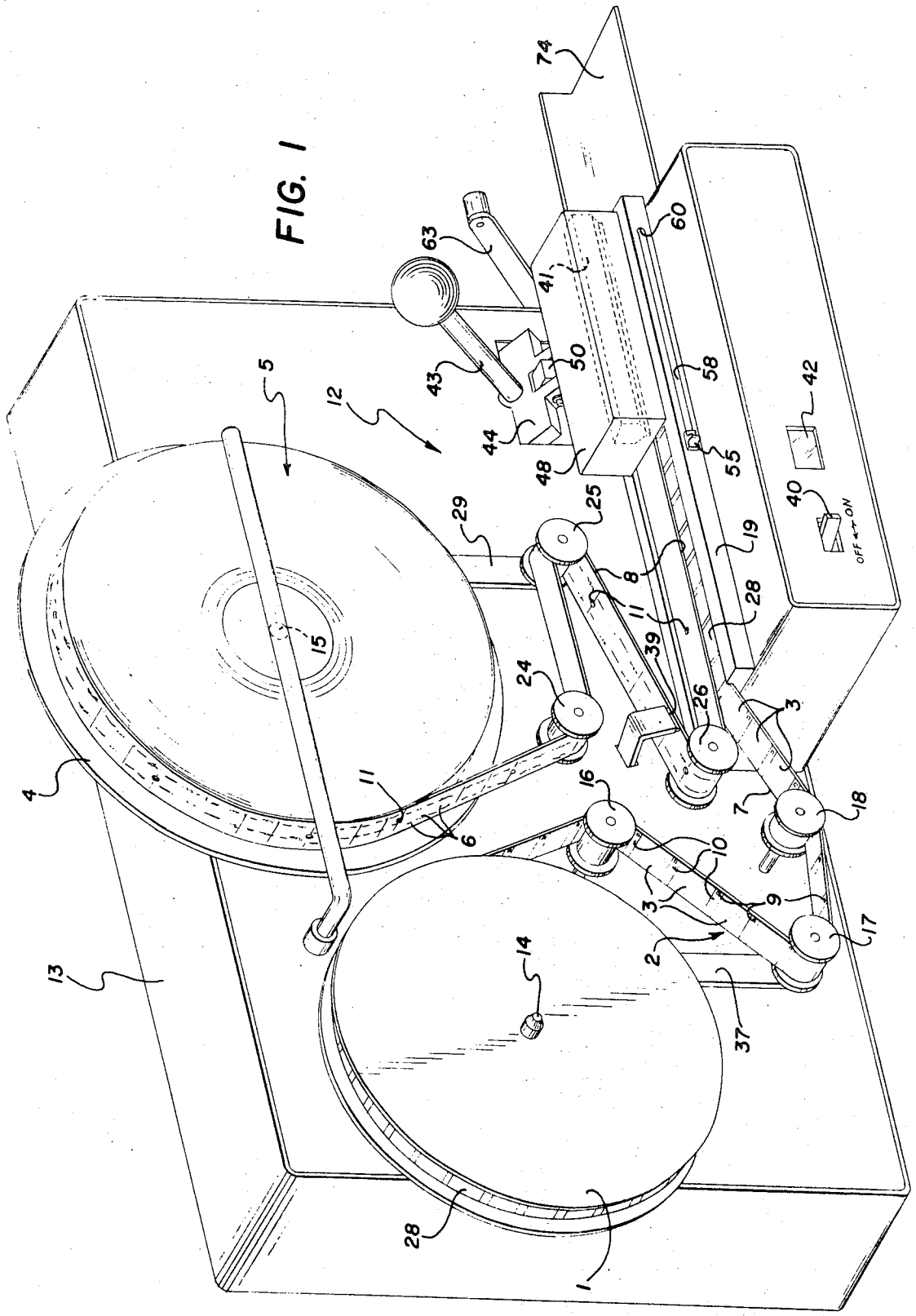

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FIG. 2

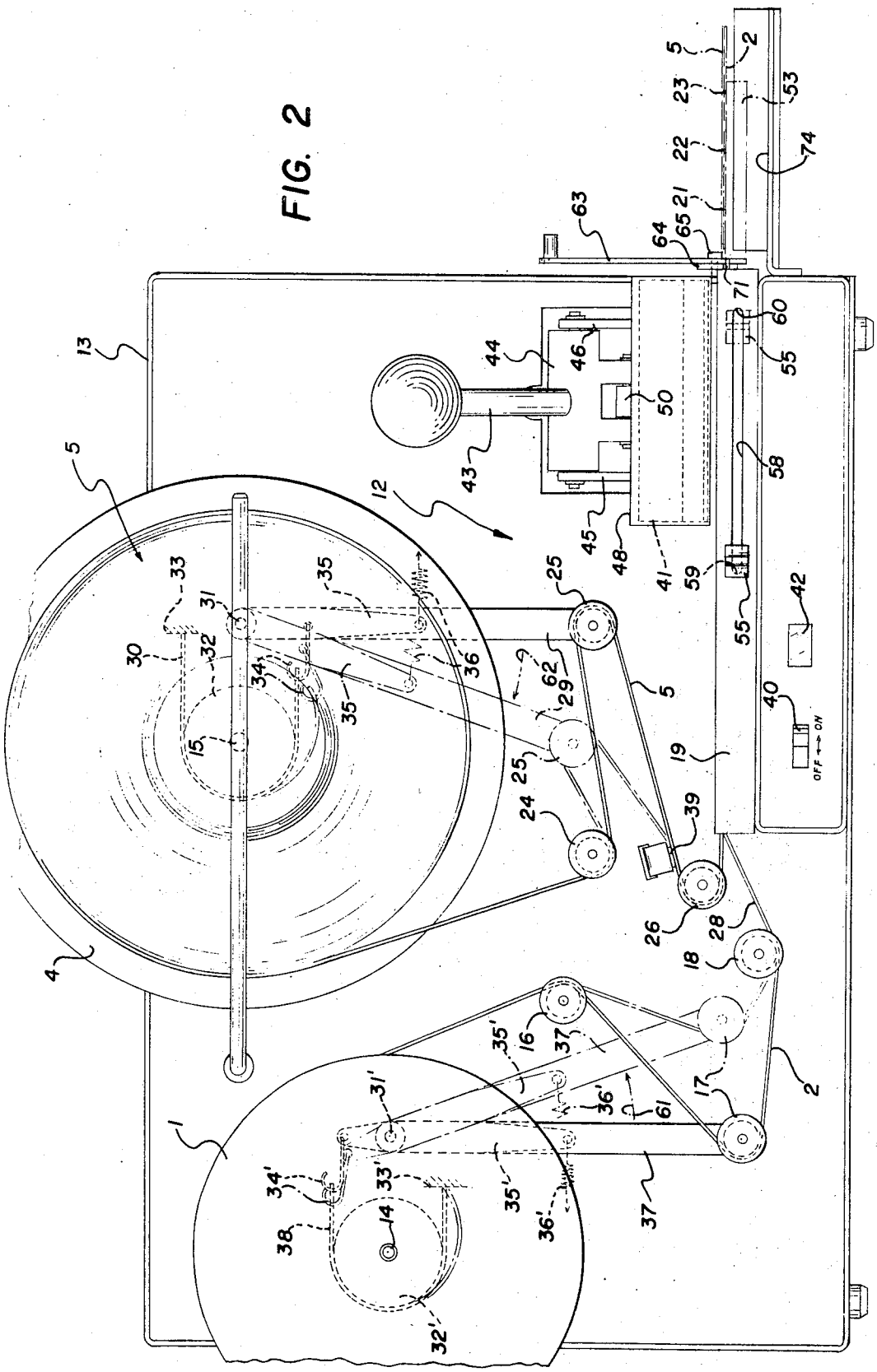


FIG. 4

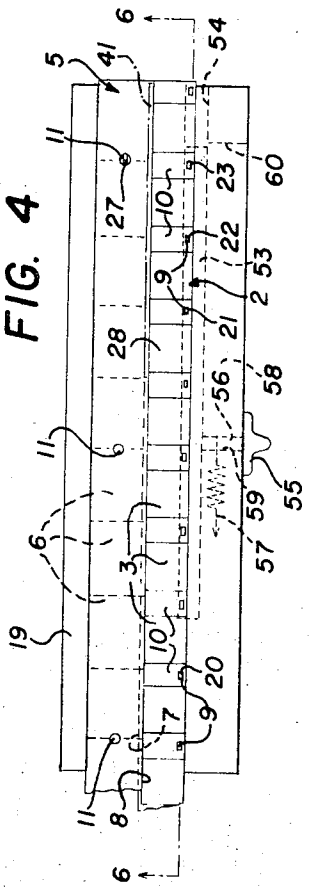


FIG. 5

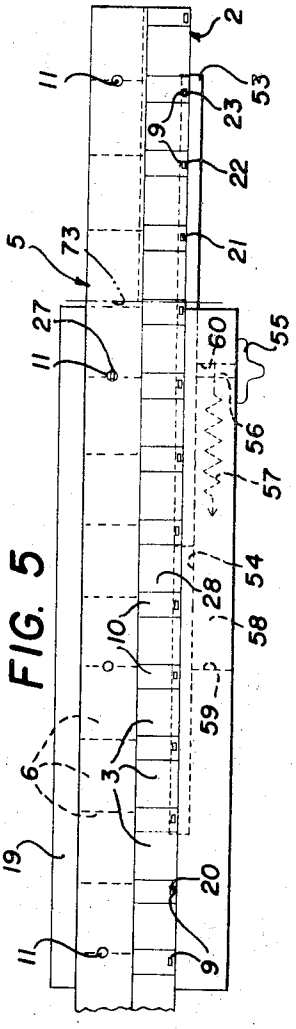


FIG. 3

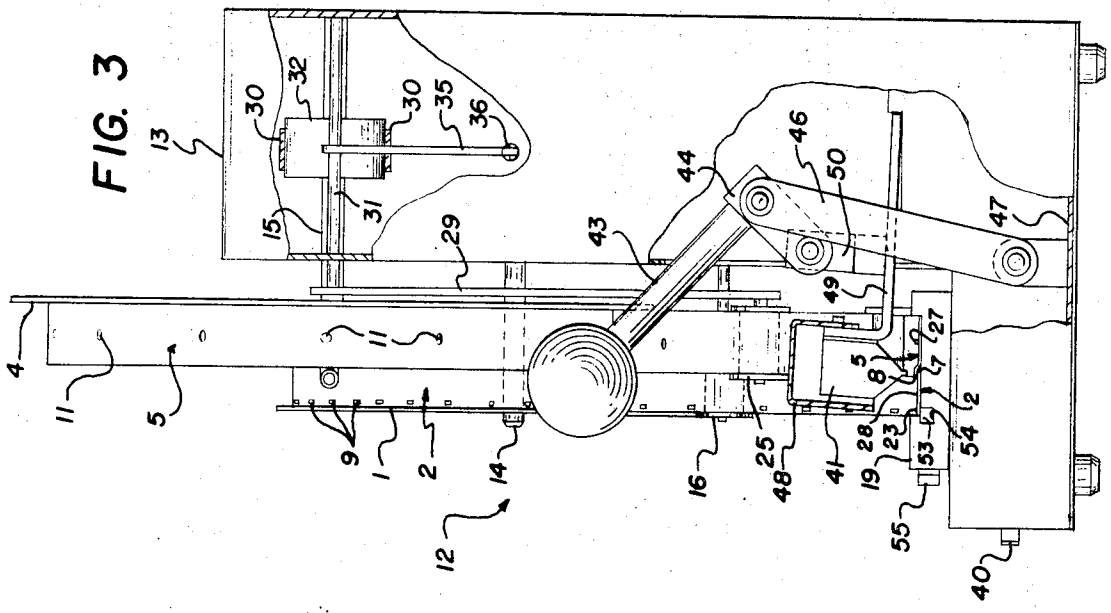


FIG. 6

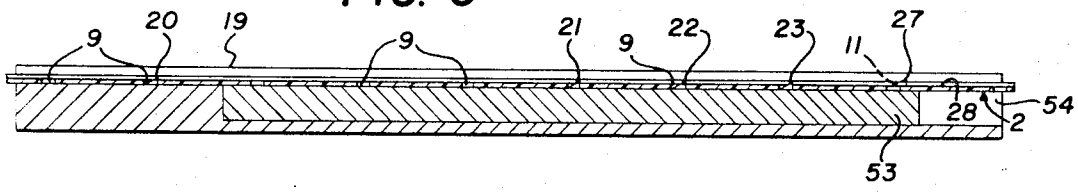


FIG. 7

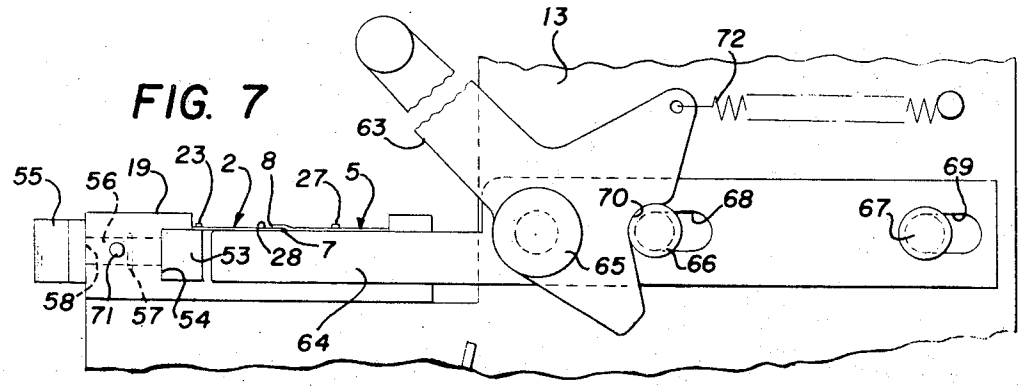


FIG. 8

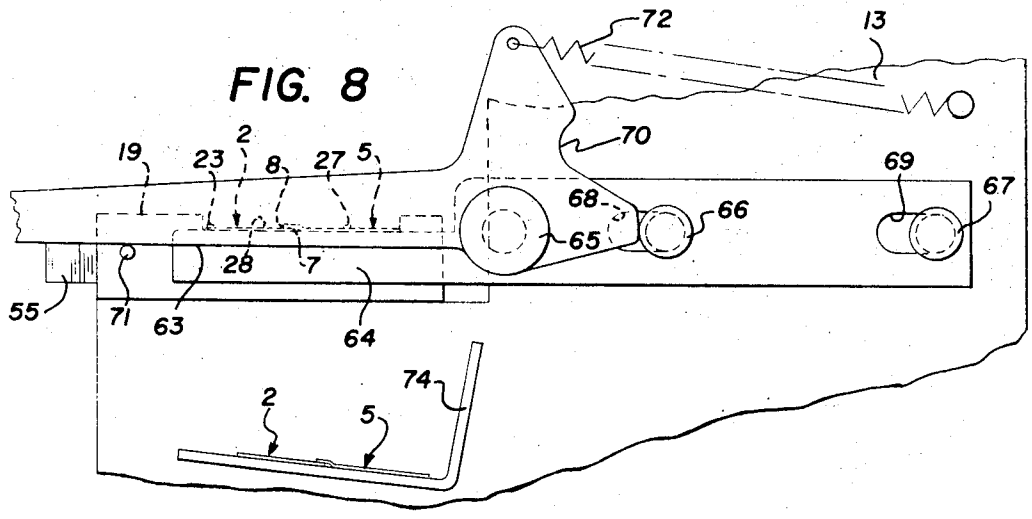


FIG. 9

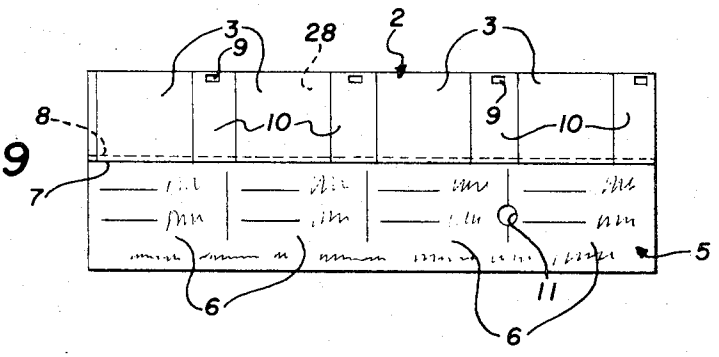


FIG. 10

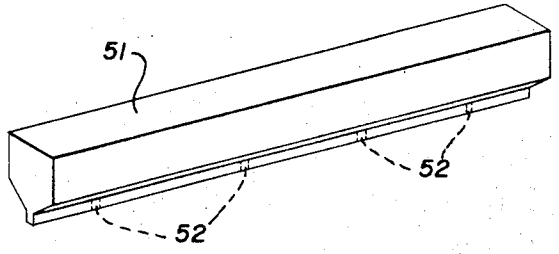
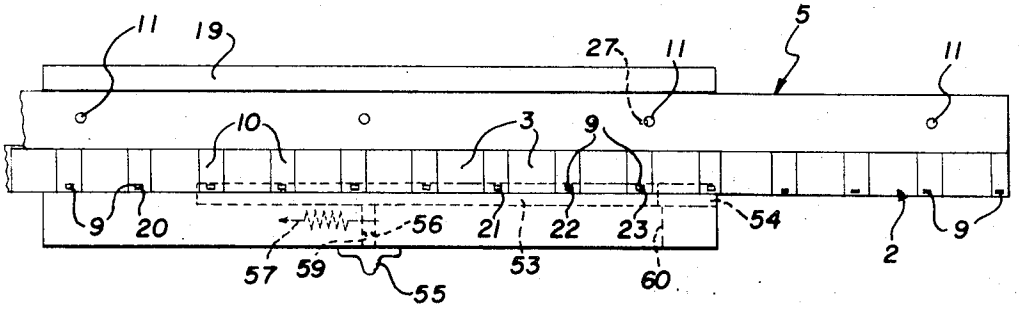


FIG. 11



METHOD FOR SECURING TOGETHER PHOTOGRAPHIC MATERIAL AND A TAB

CROSS REFERENCE TO RELATED APPLICATIONS

Reference is made to commonly assigned copending U.S. Pat. application Ser. No. 24,742 entitled FILM IDENTIFICATION AND HANDLING TAB and filed in the names of Richard K. Sprenkle, Willis L. Stockdale and Leonard H. Wunrow on Apr. 1, 1970, now abandoned. Reference is further made to commonly assigned copending U.S. Pat. application Ser. No. 229,068 entitled FILM STRIP TABBING APPARATUS and filed in the names of Oliver W. Gnage and Michael A. Petranto on Feb. 24, 1972.

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention generally relates to a method for securing together photographic material and a tab, wherein emulsion in the photographic material is used as an adhesive for adhering the tab to the photographic material, More particularly, the present invention relates to a film tabbing method wherein emulsion in a photographic film strip is (1) wetted and/or heated to cause the emulsion to become adhesive and (2) then used to adhere the film strip to a film tabbing strip.

2. Description of the Prior Art

Photofinishers processing amateur color print film and making paper prints therefrom, commonly transmit processed film negatives to a customer in the form of short negative film strips which each contain three or four image-bearing frames. Should the customer desire additional prints of particular negative frames, a print reorder is returned along with such negative frames to the photofinisher. As disclosed in commonly assigned copending U.S. Pat. application Ser. No. 24,742 (more specifically referenced hereinbefore), the print reorder may take the form of a tab which is secured to the negative film strip. In a preferred embodiment, the tab includes several print reorder information areas respectively corresponding to, and in alignment with, the different image-bearing frames contained on the negative film strip. These print reorder information areas are provided with information relating to the number and size of prints desired for the individual negative frames. Moreover, since the tab in the preferred embodiment is secured along a longitudinal edge of the negative film strip, the tab serves as a convenient means for readily handling the negative film strip without touching the film surface.

Various apparatus and methods have been previously devised for securing a film information and handling tab or the like to a negative film strip. Generally, such apparatus and methods require the use of pressure sensitive or thermal sensitive adhesive material for adhering the tab to the negative film strip. The use of such adhesive material, which is most often in the form of transparent or opaque adhesive tape, gives rise to several disadvantages, as for example the extra handling time required by the photofinisher for applying adhesive material to either the tab or the negative film strip (preparatory to adhering the tab to the negative film strip). A further disadvantage is the additional expense in the photofinishing operation resulting from the use of a separate adhesive material.

In accordance with the present invention, there has been devised apparatus and a method for securing together the tab and the negative film strip, wherein photographic emulsion in the negative film strip is used as an adhesive for adhering the tab to the negative film strip. It will be appreciated that such an apparatus and method do not require the use of any separate adhesive material, such as tape, for adhering the tab to the negative film strip and thus have certain obvious advantages over film tabbing apparatus and methods requiring the use of a separate adhesive material.

SUMMARY OF THE INVENTION

It is therefore an object of the present invention to provide a method for securing together photographic material and a tab, wherein emulsion in the photographic material is used as an adhesive for adhering the tab to the photographic material.

A further object of the present invention is to provide a method for securing together photographic material and a tab, wherein emulsion in the photographic material is softened in a manner causing the emulsion to become adhesive.

Another object of the present invention is to provide a film tabbing method wherein emulsion in a photographic film strip is (1) caused to become adhesive and (2) then used to adhere the film strip to a film tabbing strip.

In accordance with the present invention, there is described in detail hereinafter a photographic material tabbing method by which a tab and the emulsion-bearing surface of photographic material are positioned in partially overlapping relation so as to interface portions respectively of the tab and the emulsion-bearing surface. The emulsion-bearing surface portion, interfaced with the tab portion, is softened in a manner causing the photographic emulsion to become adhesive. Alternatively, the emulsion can be softened and caused to become adhesive prior to interfacing with the tab. Such softening of the photographic emulsion can be achieved, for example, by the application of liquid and/or heat to the emulsion-bearing surface. Upon pressing together the interfaced portions of the softened emulsion-bearing surface and the tab, the adhesive emulsion will effect a bond between the tab and the photographic material.

In a preferred structural embodiment of the present invention, a film tabbing apparatus is adapted to draw sections of a photographic film strip and a film tabbing strip off respective strip supply rolls, position the film and tabbing strip sections in partially overlapping relation so as to interface portions of the tabbing strip section and the emulsion-bearing surface of the film strip section, secure the film and tabbing strip sections together at the interfaced strip portions, and then sever the film and tabbing strip sections from remaining film and tabbing strip lengths wound on the respective strip supply rolls. The film and tabbing strip sections are secured together by wetting a tabbing strip portion which is (or will be) interfaced with a portion of the film strip and then heating and pressing together the interfaced strip portions. The combined application of moisture and heat to the film emulsion, softens and causes such emulsion to become adhesive.

In an alternate structural embodiment, the film and tabbing strip sections are secured together by applying steam to the interfaced strip portions.

BRIEF DESCRIPTION OF THE DRAWINGS

The above-mentioned and other features and objects of the present invention and the manner of obtaining them will become more apparent by reference to the following detailed description of a preferred embodiment of such invention taken in conjunction with the accompanying drawings wherein:

FIG. 1 is a perspective view of the film tabbing apparatus which, in accordance with a preferred embodiment of the present invention, is adapted to secure together respective sections of a photographic film strip and a film tabbing strip and then sever such secured strip sections from remaining lengths of the film strip and the tabbing strip;

FIG. 2 is a front elevation view of the film tabbing apparatus, showing the manner in which further sections of the film and tabbing strips are withdrawn from respective strip supply rolls;

FIG. 3 is a side elevation view of the film tabbing apparatus;

FIGS. 4 and 5 are top plan views of film and tabbing strip sections and a film and tabbing strip advance mechanism of the film tabbing apparatus, respectively showing the film and tabbing strip sections in position for securement together and for severence from remaining lengths of the film and tabbing strips;

FIG. 6 is a section view of the film and tabbing strip sections and the film and tabbing strip advance mechanism as viewed along the line 6—6 in FIG. 4;

FIGS. 7 and 8 are side elevation views of a scissor assembly for severing secured film and tabbing strip sections from remaining lengths of the film and tabbing strips, respectively showing the scissor assembly in idle and cutting positions;

FIG. 9 is a top plan view of film and tabbing strip sections after severence from remaining lengths of the film and tabbing strips;

FIG. 10 is a perspective view of an alternate embodiment of a strip securing member of the film tabbing apparatus; and

FIG. 11 is a view similar to FIG. 5, illustrating one phase in the operation of a film and tabbing strip alignment mechanism of the film tabbing apparatus.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now to the drawings and in particular to FIG. 1, there is shown a strip supply reel 1 on which is supported a roll of negative film strip 2 containing a longitudinally extending series of image-bearing frames (several of which are indicated by the reference number 3). Another strip supply reel 4 supports a roll of film tabbing strip 5 which is constructed of liquid permeable material, preferably paper. As disclosed in commonly assigned copending U.S. Pat. application Ser. No. 24,742 (more specifically referenced hereinbefore), the tabbing strip 5 in a preferred embodiment includes a longitudinally extending series of print reorder information areas (several of which are indicated by the reference number 6). Each of the information areas 6 can be adapted to relate to an individual one of the negative frames 3. More specifically, the information areas 6 are each provided with several print reorder information boxes (not shown) which can be selectively checked by a customer to indicate to a photofinisher the number and size of prints desired for a particular negative frame. In practice, the customer receives from the photofinisher equal length sections of the film strip 2 and the tabbing strip 3 which have been secured together along respective longitudinal edge portions 7 and 8 as shown in FIG. 9. When thus secured, the film strip 2 and the tabbing strip 3 are disposed in substantially coplanar relation and the different negative frames 3 are respectively aligned with the different information areas 6.

As shown in FIGS. 1 and 4, the negative film strip 2 further includes a longitudinally extending series of spaced perforations (several of which are indicated by the reference number 9). The film perforations 9 are respectively disposed on the film strip 2 at a plurality of opaque film areas (several of which are indicated by the reference number 10). The opaque film areas 10, in turn, located between the different negative frames 3. Also, the film tabbing strip 5, as disclosed in commonly assigned copending U.S. Pat. application Ser. No. 229,068 (more specifically referenced hereinbefore), further includes a longitudinally extending series of spaced perforations (several of which are indicated by the reference number 11). The tab perforations 11 are disposed on the tabbing strip 5 so as to be respectively separated by different tabbing strip sections which each comprise four of the print reorder information areas 6 (see FIG. 4). The purpose of the film perforations 9, the tab perforations 10 and the respective perforation spacing will become apparent hereinafter on considering the manner in which the film strip 2 and the tabbing strip 5 are aligned preparatory to securing the film and tabbing strips together.

According to a preferred structural embodiment of the present invention, there is illustrated in FIG. 1 a film tabbing apparatus 12 for securing together respective sections of the negative film strip 2 and the film tabbing strip 5 and for thereafter severing such secured strip sections from remaining lengths of the film strip and the tabbing strip. The preferred structural embodiment is best understood by considering the film tabbing apparatus 12 in light of the operational steps followed in operating the overall device. Thus, the different members of the film tabbing apparatus 12 will be described in the order in which they are encountered during a typical sequence of operation.

Referring again to FIG. 1, the film tabbing apparatus 12 includes a box-like base 13 on which is rotatably supported two reel spindles 14 and 15. After the reel 1 with a roll of the negative film strip 2 has been placed on a spindle 14, a leading section of the film strip is threaded successively over guide rollers 16, 17 and 18 and thence into a guide track 19. In the guide track 19, the film strip 2 is engaged by a film registration pin 20 and by three spaced film advance pins 21, 22 and 23 (see FIGS. 4 and 6). The pins 20–23 engage the film strip 2 upon extending into respective ones of the film perforations 9. Once a leading section of the film strip 2 is engaged by the pins 20–23, the reel 4 with a roll of the film tabbing strip 5 is placed on a spindle 15. Then, a leading section of the tabbing strip 5 is threaded successively over guide rollers 24, 25 and 26 and thence into the guide track 19. Whereupon, the tabbing strip 5 is engaged by a tab registration pin 27 which extends into one of the tab perforations 11 (see FIGS. 4 and 6). As shown in FIGS. 1, 3 and 4, the longitudinal edge portion 8 of the tabbing strip 5 overlaps the longitudinal edge portion 7 of the film strip 2, along the respec-

tively engaged strip sections in the guide track **19**, so as to partially interface the tabbing strip section and an emulsion-bearing surface **28** of the film strip section. The significance of interfacing respective portions of the tabbing strip **5** and the emulsion-bearing film surface **28** will become apparent hereinafter on considering the manner in which the tabbing strip and the film strip are secured together. Moreover, as shown in FIG. **4**, the image-bearing frames **3** on the engaged film strip section are respectively aligned with the information areas **6** on the engaged tabbing strip section.

As can be seen in FIGS. **2** and **3**, tension between the engaged section of the film tabbing strip **5** and the remaining length of such tabbing strip is maintained by a tab tensioning arm **29** (on which the guide roller **25** is rotatably supported) and by a spindle braking band **30**. The tensioning arm **29** is fixed to a pivot rod **31** which, in turn, is rotatably supported by the box-like base **13**. The braking band **30** extends partially about a spindle hub member **32**, with the opposite band ends being attached to an anchor block **33** on the base **13** and to a hook member **34** of a spindle braking arm **35**. The braking arm **35** extends substantially parallel to the tensioning arm **29** and is fixed to the pivot rod **31** so as to pivot concurrently with the tensioning arm upon rotation of the pivot rod. A helical tension spring **36** is disposed to urge the braking arm **35** in a counterclockwise direction, as viewed in FIG. **2**, to tighten the braking band **30** about the spindle hub **32** and thereby prevent rotation of the spindle **15** and the tabbing strip supply reel **4**. The spring **36** similarly urges the tensioning arm **29** to apply a strip tensioning force at a segment of the tabbing strip **5** which extends about the guide roller **25**.

Referring again to FIG. **2**, tension between the engaged section of the negative film strip **2** and the remaining length of such film strip is maintained by a film tensioning arm **37** (on which the guide roller **17** is rotatably mounted) and by a spindle braking band **38**. Since the members of the film tabbing apparatus **12** which cooperate with the film tensioning arm **37** and the braking band **38** to maintain film strip tension are substantially identical in function and structure to those members of the film tabbing apparatus which cooperate with the tab tensioning arm **29** and the braking band **30** to maintain tabbing strip tension, a description of the first-mentioned members (indicated by the reference numbers **31'**, **32'**, **33'**, **34'**, **35'** and **36'**) is considered unnecessary in view of the previous description of the tab tensioning members **31–36**. It will be appreciated, however, that the helical tension spring **36'** is disposed to urge the film tensioning arm **37** and the braking arm **35'** in a clockwise direction, as viewed in FIG. **2**, in contrast to the spring **36** which urges the tab tensioning arm **29** and the braking arm **35** in a counterclockwise direction.

Considering now the manner in which respective sections of the negative film strip **2** and the film tabbing strip **5** are secured together, there is shown in FIG. **1** a water application wick **39** which projects from the box-like base **13** to wet the tab edge portion **8** as the tabbing strip is moved successively over the guide rollers **25** and **26**. Thus, if respective sections of the film strip **2** and the tabbing strip **5** are drawn off the reels **1** and **4** and advanced into engagement with the pins **20–23** and **27** at the guide track **19** (as shown in FIGS. **3**, **4** and **6**), the edge portion **8** of such tabbing strip section will be wetted by the wick **39**. As described hereinbefore, when the film and tabbing strip sections are so engaged, the tab edge portion **8** and the emulsion-bearing surface **28** of the film edge portion **7** will be disposed in interfacing relation along the respectively engaged strip sections. Accordingly, the emulsion-bearing film surface **28** which is interfaced with the wetted tab portion **8** will be moistened by such tab edge portion. Previous to the foregoing, a switch **40** is moved from a normally opened position to a closed position as shown in FIG. **1**, so as to complete an appropriate electrical circuit (not shown) for heating a heating iron **41** to an operating temperature. A signal lamp **42**, located in the electrical circuit, is adapted to light when the heating iron **41** reaches the operating temperature. The operating temperature of the heating iron **41**, as will be described hereinafter, varies in accordance with the kind of photographic film involved. Generally, the operating temperature must be of a sufficient magnitude so that when heat from the heating iron **41** is applied to the film and tabbing strip interface, the combination of moisture from the wetted tab portion **8** and such applied heat will soften the emulsion-bearing film surface **28** and cause the film emulsion to become adhesive.

It will be appreciated that the terms "photographic emulsion" or "film emulsion," in specifically referring to the emulsion-bearing film surface **28**, comprises a suspension of sensitive silver salts in a gelatin medium forming a coating on the negative film strip **2**. Generally, however, the photographic emulsion should be of the kind which when wetted and/or heated sufficiently will soften and become adhesive.

As shown in FIGS. **2** and **3**, a hand lever **43** is fixed at one end to a block **44** which, in turn, is located between, and pivotally coupled to, spaced linkage bars **45** and **46**. A bottom plate **47** of the box-like base **13** pivotally supports the linkage bars **45** and **46** (see FIG. **3**). The heating iron **41** is fixed, along with a heating iron shield **48**, to one end of a resiliently flexible support arm **49**. The other end of the heating iron support arm **49** is fixed to the base **13**. A cam **50**, fixed to the arm **49**, is pivotally coupled to the hand lever block **44**. Accordingly, upon pressing down on the hand lever **43**, as viewed in FIG. **3**, the heating iron support arm **49** will be depressed by the cam **50**, and the heating iron **41** will be moved into abutment against the wetted tab edge portion **8** in the guide track **19**. Since such wetted tab edge portion **8** is interfaced with the emulsion-bearing film surface **28**, along the film edge portion **7**, moisture and heat are applied to the film emulsion. Such combination of moisture and heat serve to soften the film emulsion, causing the film emulsion to act as an adhesive at the film and tabbing strip interface. Pressure applied to the film and tabbing strip interface, upon being sandwiched between the guide track **19** and the heating iron **41**, forces the softened adhesive emulsion into the paper fibers of the tab edge portion **8**. Thereafter, heat from the heating iron **41** acts to vaporize moisture at the film and tabbing strip interface so as to dry the film emulsion and effect a film and tabbing strip bond. It will be appreciated that, although the heating iron **41** is further used in the film tabbing apparatus **12** to dry the moistened adhesive emulsion, other means such as an air stream directed at the film and tabbing strip interface can be used to effect such drying. Moreover, although the water application wick **39** is shown at a location preceding the guide roller **26** in

order to wet the tab edge portion 8 prior to interfacing with the film edge portion 7, the wick can be placed at another location (between the guide roller 26 and the heating iron 41) in order to wet the tab edge portion when interfaced with the film edge portion.

It will also be appreciated that the length and width of the film and tabbing strip bond are substantially defined by the length and width of the heating iron area which is applied to the film and tabbing strip interface. In the present example, as illustrated in FIG. 4, the length of the heating iron 41 has been selected in order to secure together a section of the film strip 2 which comprises four of the negative frames 3 and a section of the tabbing strip 5 which comprises four of the information areas 6.

Referring now to FIG. 10, there is shown a steam-heating iron 51 which can be used as an alternative to the heating iron 41. Steam, furnished from a suitable source (not shown), may be passed out of the heating iron 51 through a plurality of heating iron vents 52 and directed onto the film and tabbing strip interface. The directed steam will provide moisture and heat at the film and tabbing strip interface for softening and causing the film emulsion to become adhesive. Of course, in this instance, the water application wick 39 can be discarded.

The degree of moisture and heat used to soften and cause photographic emulsion to become adhesive varies according to the kind of film involved. Generally, photographic emulsion (including a gelatin medium) can be softened, causing such emulsion to become adhesive, by any one of the following procedures: (1) wetting and heating the photographic emulsion; (2) heating the photographic emulsion in situations where the ambient relative humidity provides adequate moisture so that, upon heating, the photographic emulsion will flow or soften rather than immediately dry; and (3) wetting the photographic emulsion. For example, the emulsion-bearing surface of Kodacolor II film, when exposed to 60° – 80° F and 20 percent RH – 65 percent RH, can be softened so as to cause the film emulsion to become adhesive upon moistening and heating the emulsion-bearing surface to 250° ± 25° F. In the film tabbing apparatus 12 described hereinbefore, an appropriate thermostat control (not shown) can be used to restrict the operating temperature of the heating iron 41 to a range of 250° ± 25° F. As another example, the emulsion-bearing surface of Kodacolor-X film, when exposed to 70° F and 45 percent RH, can be softened so as to cause the film emulsion to become adhesive upon heating the emulsion-bearing surface to 160° ± 20° F. As a further example, the emulsion-bearing surface of either Kodacolor-X or Kodacolor II film can be softened so as to cause the film emulsion to become adhesive upon sufficiently wetting the emulsion-bearing surface. It will be understod, generally that the greater the amount of moisture added to a photographic emulsion, the less the degree of heat required to soften such emulsion.

In FIGS. 1 and 4–6, there is shown a film advance carriage 53 from which the film engaging pins 21–23 project. The carriage 53 is movable back and forth along a channel 54 in the guide track 19. A carriage advance knob 55, fixed to the carriage 53 by an interconnecting pin 56, facilitates such carriage movement to the right as viewed in FIGS. 4 and 5. As further viewed in FIGS. 4 and 5, the carriage 53 is urged to the left by a helical spring tension spring 57. The range of travel of the carriage 53, along the channel 54, is restricted by a limit slot 58 through which the interconnecting pin 56 extends. Specifically, when the carriage 53 is located in a normal left-most position as shown in FIG. 4, the interconnecting pin 56 abuts against an end 59 of the limit slot 58. When the carriage 53 is located in a right-most position as shown in FIG. 5, the interconnecting pin 56 abuts against an end 60 of the limit slot 58. In the normal left-most position, the carriage 53 is disposed completely within the channel 54 (see FIGS. 4 and 6). Whereas, in the right-most position, the carriage 53 partially extends out of the channel 54 (see FIG. 5).

After respective sections of the negative film strip 2 and the film tabbing strip 5 have been secured together in the manner previously described, such secured strip sections are moved out of the guide track 19 by pushing the film advance carriage 53 from the left-most position shown in FIGS. 4 and 6 to the right-most position shown in FIG. 5. When the carriage 53 with the secured strip sections is first advanced from the left-most position, the film strip 2 and the tabbing strip 5 will be disengaged from the film and tab registration pins 20 and 27 (which are fixed to the guide track 19). However, when the carriage 53 with the secured strip sections reaches the right-most position (see FIG. 5), the film strip 2 and the tabbing strip 5 will again be engaged by the film and tab registration pins 20 and 27. As viewed in FIG. 2, upon advancing the carriage 53 with the secured strip sections from the left-most position to the right-most position, a segment of the film strip 2 which extends about the guide rollers 16-18 will be pulled toward the guide track 19, thereby pivoting the film tensioning arm 37 in a counterclockwise direction generally indicated by an arrow 61. Moreover, a segment of the tabbing strip 5 which extends about the guide rollers 24–26 will simultaneously be pulled toward the guide track 19, thereby pivoting the tab tensioning arm 29 in a clockwise direction generally indicated by an arrow 62. As further shown in FIG. 2, the spindle braking arms 35′ and 35 will be pivoted with the film and tab tensioning arms 37 and 29 in such counterclockwise and clockwise directions. Accordingly, the spindle braking bands 38 and 30 will slacken about the spindle hubs 32′ and 32 so as to permit the spindles 14 and 15 and the film and tabbing strip supply reels 1 and 4 to freely rotate. At this time, since the springs 36′, 36 now serve to pivot the film and tab tensioning arms 37, 29 and the spindle braking arms 35′, 35 in directions opposite to those generally indicated by the arrows 61 and 62, the film and tab tensioning arms will draw further lengths of the film strip 2 and the tabbing strip 5 off the respective strip supply reels 1 and 4 and the spindle braking bands 38, 30 will begin to tighten about the spindle hubs 32′, 32. Upon pivoting of the film and tab tensioning arms 37, 29 and the spindle braking arms 35′, 35 to normal or original positions, the spindles 14, 15 and the reels 1, 4 can no longer freely rotate since the braking bands 38, 30 are again firmly tightened about the spindle hubs 32′, 32. It will be realized that, since a section of the film strip 2 comprising four of the negative frames 3 and a section of the tabbing strip 5 comprising four of the information areas 6 have been moved out of the guide track 19 upon advancing the carriage 53 from the left-most position to the right-most position, identical length sections of the film and

tabbing strips will have been drawn off the respective strip supply reels 1 and 4 by the film and tab tensioning arms 37 and 29.

Referring now to FIGS. 7 and 8, there is shown a lever blade 63 which is pivotally connected to a slide blade 64 by a coupling pin 65. A cam pin 66 and a stop pin 67, both of which project from the box-like base 13, extend through slots 68 and 69 in the slide blade 64 so as to support such blade for movement in left and right directions as viewed in FIGS. 7 and 8. Upon pivoting the lever blade 64 in a conterclockwise direction about the coupling pin 66, the lever and slide blades will simultaneously be moved to the left, as viewed in FIGS. 7 and 8, owing to the interaction of the cam pin 66 and a camming edge 70 of the lever blade. A stop pin 71, fixed to the guide track 19, limits such counterclockwise pivotal movement of the lever blade 63 (see FIG. 8). Moreover, the stop pin 67 and the slot 69 cooperate to limit movement of the lever and slide blades to the left. Upon releasing the lever blade 63, a helical tension spring 72, interconnecting the lever blade and the base 13 serves to return the lever and slide blades to a normal or original position as shown in FIG. 7.

Once the respectively secured sections of the negative film strip 2 and the film tabbing strip 5 have been moved out of the guide track 19 so as to draw further lengths of the film and tabbing strips off the reels 1 and 4 (see FIGS. 2 and 5), the film member of the secured strip sections is disengaged from the carriage pins 21–23 upon releasing the carriage 53 (which is returned to the normal left-most position by the spring 57). Thereafter, the secured film and tabbing strip sections can be severed from trailing sections of the film and tabbing strips 2 and 5. At this time, in the guide track 19, the trailing section of the film strip 2 is engaged by the film registration pin 20 and the carriage pins 21–23, and the trailing section of the tabbing strip 5 is engaged by the tab registration pin 27. To sever the secured film and tabbing strip sections from the trailing film and tabbing strip sections, along a cutting line 73 schematically illustrated in FIG. 5, the lever blade 63 is pivoted in a counterclockwise direction about the coupling pin 65, as shown in FIGS. 7 and 8. Movement of the lever blade 63 alongside the slide blade 64 effects the necessary strip cutting action and the secured film and tabbing strip sections drop into a collection bin 74.

If either one of the trailing film and tabbing strip sections is not engaged in the guide track 19 by an appropriate one of the film and tab registration pins 20 and 27, then upon severence of the trailing film and tabbing strip sections from the secured film and tabbing strip sections, the non-engaged one of the trailing strip sections will be slightly pulled to the left as viewed in FIGS. 2 and 4 by an appropriate one of the strip tensioning arms 37 and 29. Whereupon, the non-engaged strip section will be moved into engagement with an appropriate one of the strip registration pins 20 and 27. Specifically, as illustrated in FIG. 11, if the tab member of the trailing film and tabbing strip sections is not engaged by the tab registration pin 27, then upon severing the trailing film and tabbing strip sections from the secured film and tabbing strip sections, such non-engaged tab member will be free to move along the guide track 19. Thus, the non-engaged tab member will be slightly pulled to the left, onto the tab registration pin 27, by the tab tensioning arm 29. Generally, the foregoing situation does not arise. However, such situation may occur in instances where the paper tabbing strip 5 has swelled because of exposure to a relatively high ambient humidity, so that the respective spacing between the perforations 11 has slightly increased.

It will be appreciated that although the film tabbing apparatus 12 has been described in use with the negative film strip 2, such apparatus can be modified to accommodate other photographic material such as photographic paper having an emulsion coating.

The present invention has been described in detail with particular reference to a preferred embodiment thereof, but it will be understood that variations and modifications can be effected within the spirit and scope of the invention.

We claim:

1. A method of securing together photographic material and a tab therefor, wherein the photographic material has an emulsion-bearing surface which can be softened in a manner causing the emulsion to become adhesive, said method comprising:

softening at least a portion of the emulsion-bearing surface of such photographic material to cause the emulsion to become adhesive; and

pressing together a softened emulsion-bearing surface portion and such a tab.

2. A method as recited in claim 1, wherein the photographic material has an emulsion-bearing surface which when heated will soften and cause the emulsion to become adhesive, and wherein said softening step includes:

heating at least a portion of the emulsion-bearing surface to cause the emulsion to become adhesive.

3. A method as recited in claim 1, wherein the photographic material has an emulsion-bearing surface which when wetted will cause the emulsion to become adhesive, and wherein said softening step includes:

wetting at least a portion of the emulsion-bearing surface to cause the emulsion to become adhesive.

4. A method as recited in claim 1, wherein the photographic material has an emulsion-bearing surface which when wetted and heated will soften and cause the emulsion to become adhesive, and wherein said softening step includes:

wetting and heating at least a portion of the emulsion bearing surface to cause the emulsion to become adhesive.

5. A method of securing together photographic material and a tab therefor, wherein the photographic material, has an emulsion-bearing surface which can be softened in a manner causing the emulsion to become adhesive, said method comprising:

positioning such a tab and the emulsion-bearing surface of such photographic material in partially overlapping relation so as to interface portions respectively of the tab and the emulsion-bearing surface;

softening an emulsion-bearing surface portion which is interfaced with a tab portion to cause the emulsion to become adhesive; and

pressing together interfaced portions of the emulsion-bearing surface and the tab, when the emulsion is adhesive.

6. A method as recited in claim 5, wherein the photographic material is a film strip having a longitudinally extending series of image-bearing frames and the tab is a film tabbing strip having a longitudinally extending

series of information areas which can be respectively aligned with the image-bearing frames, and wherein said positioning step includes:

arranging such a film strip and such a film tabbing strip so that the image bearing frames and the information areas are respectively aligned.

7. A method as recited in claim 5, wherein the photographic material has an emulsion-bearing surface which when wetted and heated will soften and cause the emulsion to become adhesive, and wherein said softening step includes:

applying steam to an emulsion-bearing surface portion which is interfaced with a tab portion to cause the emulsion to become adhesive.

8. A method of securing together photographic material and a tab therefor, wherein a photographic material has an emulsion-bearing surface which when wetted and heated will soften and cause the emulsion to become adhesive, and wherein the tab is constructed of liquid permeable material, said method comprising:

wetting such a tab;

positioning a wetted tab and the emulsion-bearing surface of such photographic material in partially overlapping relation so as to interface portions respectively of the wetted tab and the emulsion-bearing surface;

heating an emulsion-bearing surface portion which is interfaced with a tab portion; and

pressing together interfaced portions of the emulsion-bearing surface and the tab.

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