Sept. 28, 1971 T. S. CHOU ET AL 3,608,115

APPARATUS FOR MAKING ALBUMS

Filed May 18, 1970 3 Sheets-Sheet 1

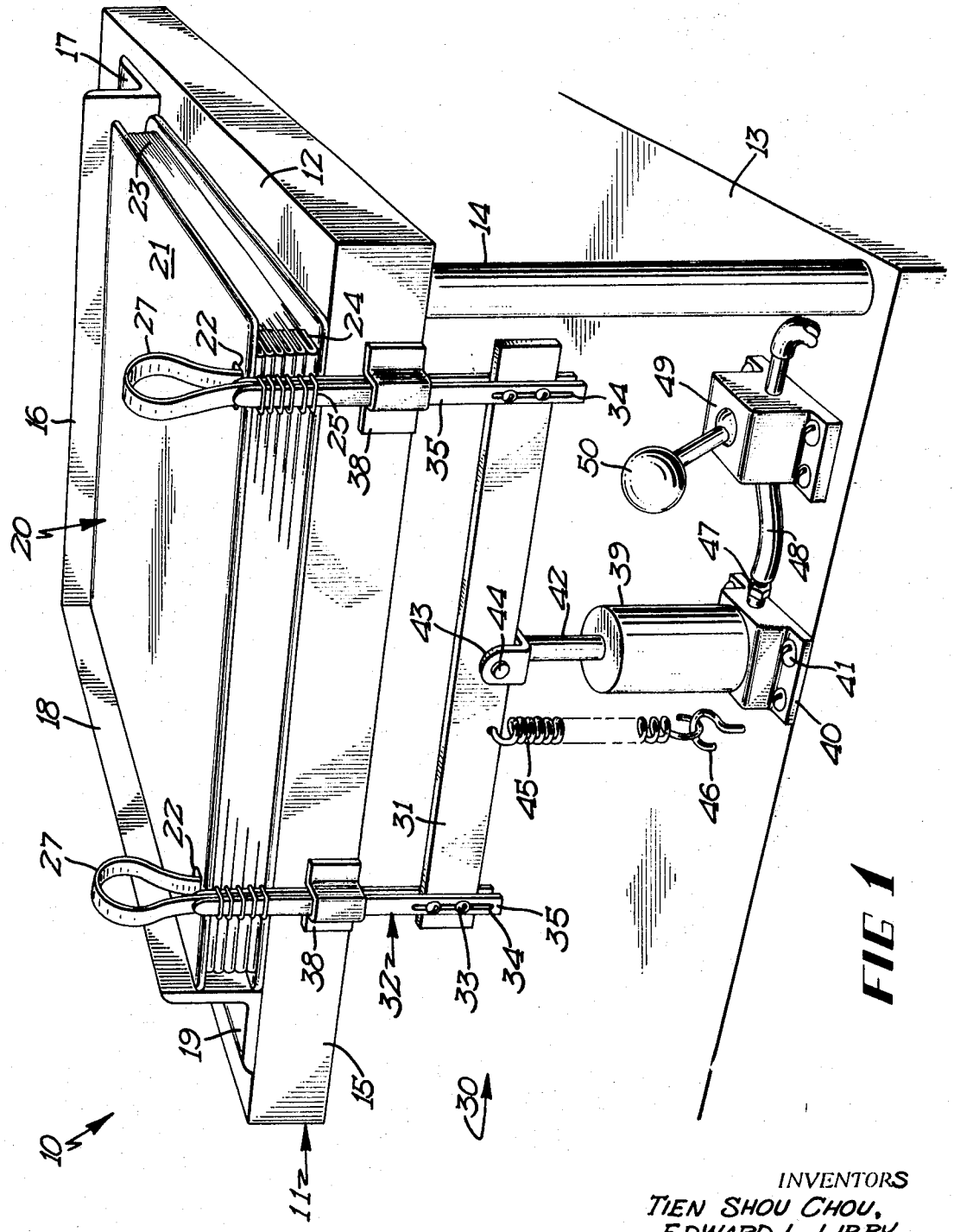


FIG 1

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Filed May 18, 1970 3 Sheets-Sheet 2

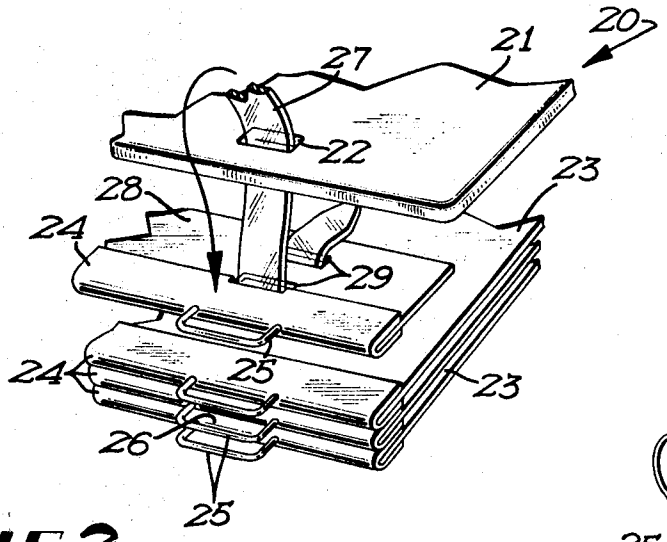


FIG 2

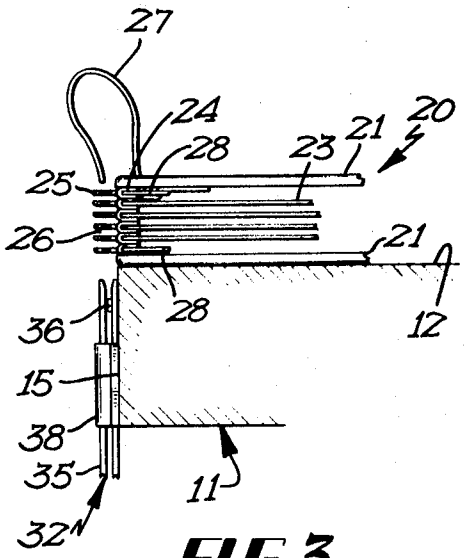


FIG 3

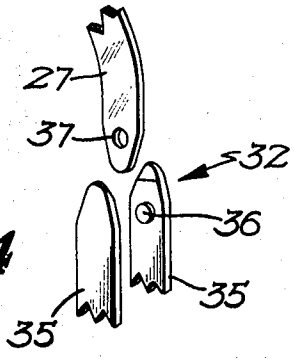


FIG 4

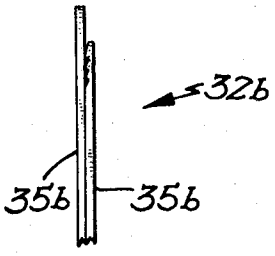


FIG 6

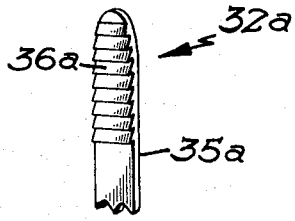


FIG 5

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APPARATUS FOR MAKING ALBUMS

Filed May 18, 1970 3 Sheets-Sheet 3

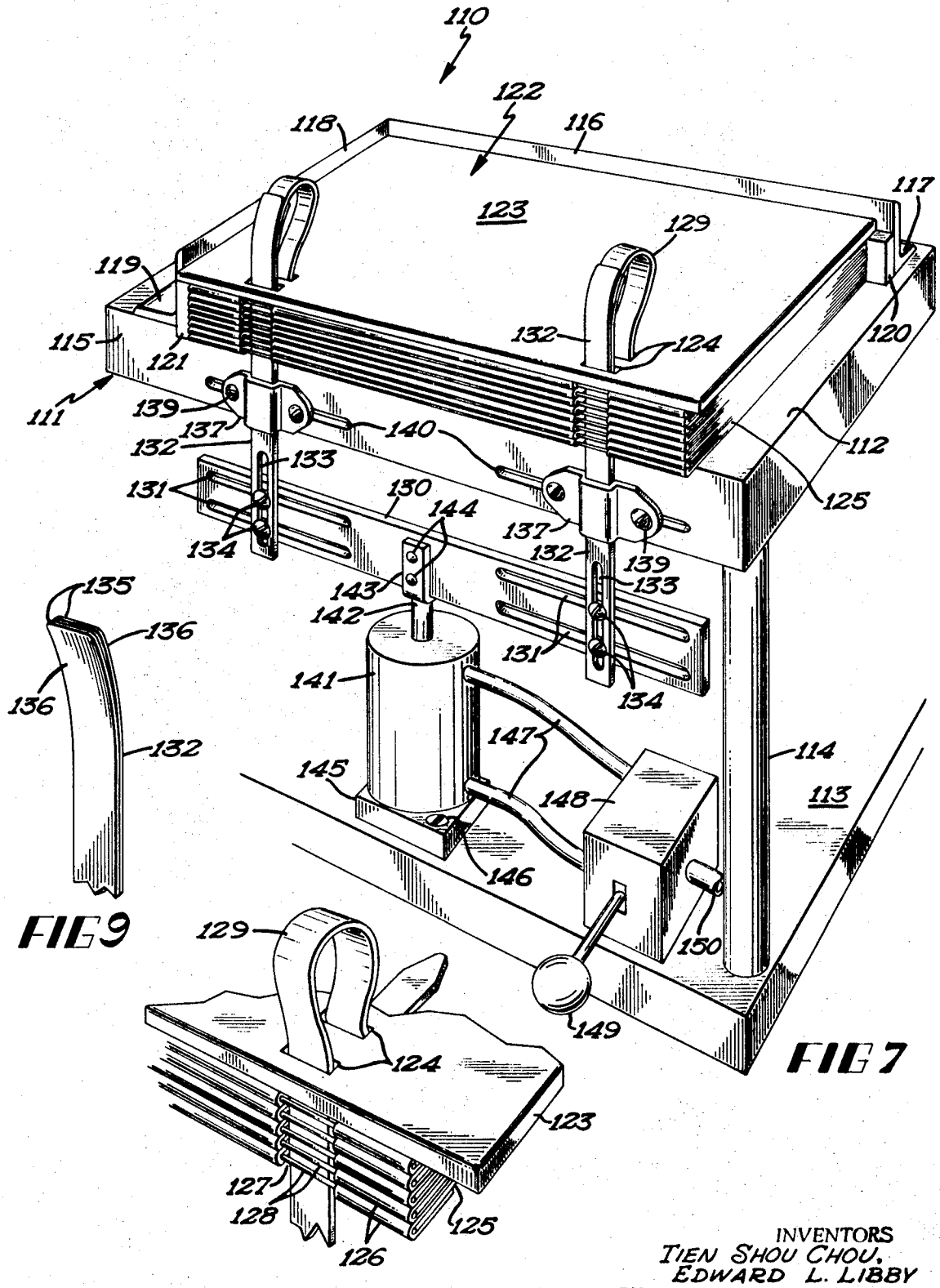


FIG 9

FIG 8

FIG 7

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United States Patent Office 3,608,115 Patented Sept. 28, 1971

3,608,115

APPARATUS FOR MAKING ALBUMS

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Continuation-in-part of application Ser. No. 774,971, Nov. 12, 1968. This application May 18, 1970, Ser. No. 38,057

Int. Cl. B42c *19/00*

U.S. Cl. 11—1R 10 Claims

ABSTRACT OF THE DISCLOSURE

A plurality of album pages are bound to the front and rear album covers by means of a pair of straps which are threaded through slots in the covers and hinge elements on the pages. The pages and covers are positioned on a support so that the hinge elements on the pages are arranged in a pair of registering rows, and a pair of strap engaging members are extended through the recesses defined by the hinge elements to engage one end of each strap, the other end of each strap being secured to one cover. The strap engaging members are then simultaneously shifted in a return direction to simultaneously pull one end of each strap through the hinge elements, the straps then being secured to the other cover.

This is a continuation-in-part application of my co-pending application, Ser. No. 774,971, entitled Apparatus for Making Albums, filed Nov. 12, 1968, now abandoned.

SUMMARY OF THE INVENTION

It is an object of this invention to provide a novel apparatus for binding a plurality of album pages to the front and rear album covers, wherein binding straps simultaneously are pulled through hinge elements by strap engaging media so that opposite ends of the straps may be secured to the front and rear covers respectively.

A more specific object of this invention is to provide an apparatus for binding a plurality of album pages to the front and rear album covers, of the class described, wherein the strap engaging media comprises a pair of members each including a pair of jaw elements engageable with each strap and being power shifted through advanced and return strokes.

These and other objects and advantages of this invention will more fully appear from the following description made in connection with the accompanying drawings wherein like reference characters refer to the same or similar parts throughout the several views.

BRIEF DESCRIPTION OF THE FIGURES OF THE DRAWINGS

FIG. 1 is a perspective view of one embodiment of the apparatus comprising the invention;

FIG. 2 is a fragmentary perspective view thereof illustrating the manner in which the binding straps are secured to the cover and threaded through the hinge elements of each album page;

FIG. 3 is a fragmentary end elevational view of a portion of the apparatus illustrating the position of the strap engaging members after the return stroke;

FIG. 4 is a fragmentary perspective view illustrating the size and the configuration of the jaw elements of a strap engaging member;

FIG. 5 is a perspective view of a different embodiment of a jaw element of the strap engaging members;

FIG. 6 is a side elevational view of a further embodiment of the strap engaging members;

FIG. 7 is a perspective view similar to FIG. 1 but

illustrating another embodiment of the apparatus comprising the invention;

FIG. 8 is a fragmentary perspective view similar to FIG. 2 illustrating the manner in which the embodiment of FIG. 7 secures the straps to the album pages; and

FIG. 9 is a perspective view illustrating the embodiment of the jaw elements of FIG. 7.

DETAILED DESCRIPTION OF THE INVENTION

Referring now to the drawings and more specifically to FIG. 1, it will be seen that one embodiment of the apparatus for binding album pages to the front and rear covers is there shown. This apparatus, designated generally by the reference numeral **10** includes a support structure **11**, which in the embodiment shown, may be in the form of a table having a substantially flat upper surface **12**. The support structure may be supported in spaced relation upon a support surface, such as a floor **13** by means of suitable legs **14**, only one of which is shown in the drawing. The support structure may also have any configuration but is preferably rectangular and has one vertically oriented substantially straight edge surface **15**.

The support structure **11** is provided with a longitudinal positioning member **16** which is vertically oriented but which is provided with a horizontal leg **17** that is secured to the support structure. A transverse positioning member **18** is secured to the upper surface of the support structure **11** and projects upwardly therefrom and is provided with a leg **19** which is secured to the support structure. It will be noted that the positioning members **16** and **18** are arranged in right angular relationship and although not shown in the drawing may be adjusted relative to the support structure to accommodate albums of various size.

Referring now to FIGS. 1, 2 and 3, it will be seen that the details of construction of the album to be bound is there shown. Each album **20** includes front and rear covers **21** which are of substantially identical construction and each being of generally rectangular flat configuration. The front and rear covers are each formed of a somewhat rigid material which may be provided with an exterior attractive outer covering sheet. The front and rear album covers **21** each have a pair of elongate slots **22** therein adjacent one longitudinal edge thereof. The slots extend longitudinally of the covers and are disposed in alignment with each other.

Each album page **23** is formed of a suitable dimensionally stable paper or other material and each is of generally rectangular configuration but having slightly smaller width and length dimensions than the covers **21**. Each album page **23** has an elongate adhesive coated strip or tab **24** folded and applied to the inner longitudinal edge of each page as best seen in FIG. 2. Each strip or tab serves to secure a pair of generally U-shaped hinge elements **25** to the longitudinal edge portion of the associated album page so that the hinge elements **25** are disposed in substantially the same general plane as the associated album page. These U-shaped hinge elements penetrate the strip or tab and have their innermost ends (not shown) offset so that the hinge elements are secured against the longitudinal edge of the associated page by the strip or tab **24**. The offset ends of the hinge elements may be of the type disclosed in copending application, Ser. No. 663,653, filed Aug. 28, 1967, now Patent 3,469,479 issued Sept. 19, 1969. It is also pointed out that the hinge elements **25** define a strap confining recess **26** of a size to accommodate the elongate flexible hinge straps **27**.

The album also includes a strap retaining member **28** which is also of elongate rectangular construction having

a length dimension corresponding to the dimension of the album pages but, as shown, having a relatively small width dimension. This strap retaining member **28** is also provided with an elongate tab **24** which is applied to one edge thereof for mounting a pair of hinge elements **25** thereto, the hinge elements **25** falling in the same general plane as the strap retaining member **28**. It will further be noted that the strap retaining member **28** has a pair of transversely spaced slots therein adjacent each end thereof. Thus two pairs of slots **29** are provided in each strap retaining member and each pair of slots adjacent one end thereof are disposed in spaced apart parallel relation. It is also pointed out that a strap retaining member is interposed adjacent the rear cover as well as the front cover.

During binding or assembly of an album, the hinge straps **27** are looped through the slots **29** in the strap retaining member adjacent one cover and the straps are then pulled upwardly through the slots in the adjacent cover as best seen in FIGS. 1 and 2. The positioning members **16** and **18** will serve to position the covers and pages so that the hinge elements are arranged in a pair of vertically registering rows as best seen in FIG. 1.

Means are provided for engaging and simultaneously pulling the hinge straps **27** through the strap confining recesses of the hinge elements accurately and effectively to facilitate the album binding operation. To this end, a strap engaging media **30** is provided and is comprised of an elongate substantially flat rectangular mounting member **31**. A pair of strap engaging members are secured to opposite ends of the mounting member **31** by bolt and nut assemblies **33** or their equivalents which extend through openings in the mounting member and elongate slots **34** in the lower end portions of the strap engaging members. It will be noted that the strap engaging members **32** are comprised of a pair of similar elongate substantially flat strap engaging elements **35** each having a width slightly less than the width of the strap confining recesses **26** so that each pair of strap engaging elements **35** comprising each strap engaging member may be inserted through the registering row of hinge elements.

It will be noted that the strap engaging elements **35** are positioned on opposite sides of the mounting member **31** and project upwardly therefrom. One of the strap engaging elements **35** has a small magnetic element **36** affixed to the inner surface thereof and projecting laterally therefrom into engaging relation with the other strap engaging element. In the embodiment shown, each magnetic element **36** is of circular configuration and is adapted to pass through an opening **37** in the end portion of the strap **27**. The strap engaging elements **35** comprising each strap engaging member are formed of magnetic material and are urged toward each other by the action of magnetic force so that when the strap engaging elements are urged apart, they will engage the end portion of a strap **27** inserted therebetween, the magnetic element **36** passing through the opening **37** of the strap.

Means are provided for guiding the strap engaging members **32** through an advanced stroke and thereafter through a return stroke and this means comprises a pair of guide members **38** of generally U-shaped construction which are vertically oriented and which are affixed to the longitudinal edge surface **15** of the support structure **11**, as best seen in FIG. 1. Means are also provided for power shifting the mounting member and strap engaging members mounted thereon through the advance and return strokes and this means comprises a vertically oriented pneumatic cylinder **39** which is rigidly secured to a mounting bracket **40** which in turn is secured to the support surface **13** by means of bolts or screws **41**. In the embodiment shown, the pneumatic cylinder **39** is a single acting type and has a piston therein to which is connected a piston rod **42** which projects exteriorly of the cylinder. The upper end of the piston rod **42** is provided with the ears **43** which are secured by suitable securing means, such as the bolt assembly **44** to the mid-portion of the mounting member **31**. The mounting member is also apertured adjacent to the mid-portion to receive one end of a helical spring **45**, the spring also being secured to a hook shaped anchoring element **46** which is secured to the support surface **13**. Thus it will be seen that the helical spring **45** yieldably resists upward shifting movement of the mounting member during the advance stroke of the strap engaging members.

The mounting bracket **40** which is integrally formed with the cylinder **39** has a passage therein which intercommunicates with the interior of the cylinder **39** and this passage is connected by a fitting **47** which in turn is connected to a conduit **48**. The conduit **48** is connected to a source of air under pressure. A valve mechanism **49** is interposed in flow controlling relation with respect to the conduit **48** and an actuating handle **50** serves to shift the valve element of the valve mechanism between open and closed positions. Thus a user may intercommunicate the cylinder **39** with the source of air under pressure by shifting the actuating handle thereby causing the piston rod **42** to be extended from the retracted position to the extended position as illustrated in FIG. 1. Thereafter, by shifting the actuating handle **50** to a closed position, the interior of the cylinder **39** will be closed with respect to the source of air under pressure thereby allowing the air within the cylinder to bleed therefrom through a bleed port in the cylinder (not shown) whereby the helical spring **45** will urge the strap engaging members **32** through the return stroke.

Referring now to FIG. 5, it will be seen that a different embodiment of a strap engaging element is there shown and designated generally by the reference numerals **32***a*. Each strap engaging element **35***a* has a plurality of teeth **36***a* formed on the inner face thereof to facilitate gripping of the end of the strap **27** between the strap engaging elements **35***a*. In this regard, it is pointed out that the strap engaging elements **35** are preferably formed of spring steel so that these elements may be forceably spread apart but will be urged toward each other because of the resilient construction thereof.

Referring now to FIG. 6, it will be seen that a further embodiment of the strap engaging member is there shown and this embodiment designated generally by the reference numeral **32***b* also includes a pair of strap engaging elements **35***b*, one of which is longer than the other. With this arrangement, opening of forceable threading of the strap engaging elements **35***b* is facilitated for insertion of the strap therebetween. Again it is pointed out that the strap engaging elements are formed of spring steel. One of the strap engaging elements **35***b* is provided with teeth **36***b* to facilitate gripping of the straps. It is also pointed out that both strap engaging elements **35***b* could be provided with teeth in the manner of the embodiment of FIG. 5.

During operation of the apparatus, one of the album covers **21** will be positioned upon the flat upper surface **12** of the support structure **11**, and a plurality of album pages **23** will be positioned upon the album cover. Thereafter, the other album cover will be positioned upon the uppermost album page **23**, there being provided a strap retaining member **28** between each album cover **21** and the adjacent album page **23**.

One end portion of each strap **27** will be looped through each of the uppermost strap retaining members **28** and will be pulled through the adjacent slot **22** and the upper album cover **21** as best seen in FIGS. 1 and 2. The strap engaging media **30** will be in the retracted position but each strap engaging member **28** will be aligned with the registering strap confining recesses of the hinge elements **25**. The valve mechanism **49** may be actuated by means of the handle **50** so that air under pressure may be applied to the cylinder **39** thus extending the piston rod **42** and forcing the strap engaging members **32** upwardly against the bias of the spring **45**. The strap engaging mem-

bers 32 will pass through the recess defined by the registering rows of hinge elements so that the uppermost end portions of the strap engaging members project above the hinge elements on the uppermost album page 23. The strap engaging elements 35 will be forceably separated and the end portions of the straps 27 positioned therebetween so that the magnetic element 36 passes through the opening 37 in each strap. In the embodiment of FIGS. 5 and 6, the teeth on one or both of the strap engaging elements will permit effective gripping of the straps 27.

Thereafter, the handle 50 is shifted to the closed position, closing the supply of air to the cylinder 39 and allowing the spring 45 to return the strap engaging members to the retracted position as best seen in FIG. 3. The strap engaging elements are then disengaged from the straps and the end portions of the straps are then inserted through the slots of the cover and are then looped through the adjacent strap retaining member.

This particular operation facilitates binding of the front and rear covers to album pages allowing an operator to bind and assemble a plurality of albums more quickly than through a completely manual operation. It is pointed out that the actuator handle for the valve mechanism may be replaced by a foot peddle so that the valve mechanism, if positioned on a floor surface, may be operated by the foot of an operator.

Referring now to FIGS. 7, 8 and 9, it will be seen that another embodiment of the binding apparatus designated generally by the reference numeral 110 is there shown. This apparatus also includes a substantially flat support structure 111 which may be in the form of table having a substantially flat upper surface 112. The support structure may be supported by suitable legs 114 upon any conventional support 113. The support structure 111 is of rectangular configuration and is provided with vertical straight sides 115.

An elongate substantially straight longitudinal cover positioning member 116 is affixed to the upper surface of the support structure 111 and is provided with a horizontal flange or leg 117. It will be noted that the cover positioning member 116 is vertically oriented and is integral with a transverse cover positioning member 118 which is arranged at right angles thereto. This transverse cover positioning member is also provided with a flange or leg 119 which is secured to the support structure.

The longitudinal cover positioning member 116 is provided with an elongate longitudinal page positioning member 120 which is affixed to the inner vertical surface of the longitudinal cover positioning member and extends throughout substantially the length thereof. An elongate transverse page positioning member 121 is rigidly affixed to the transverse cover positioning member 118 along the inner vertical surface thereof and extends substantially throughout the length of the cover positioning member 118. These page positioning members are adapted to be engaged by the longitudinal and transverse edges of a plurality of album pages to be found, while the cover positioning members are adapted to be engaged by the respective transverse and longitudinal edges of the cover during the binding operation. It is pointed out that the page positioning members may vary with respect to their thickness dimension, as well as their width or height dimension so that the number of pages adapted to be bound in an album may be varied and so that the size of the pages relative to the covers may be varied.

In this regard, it will be noted that the album 122 to be bound is comprised of an album cover 123 having longitudinally spaced apart pairs of slots 124 therein adjacent one longitudinal edge thereof. In the embodiment shown in FIG. 7, only one cover is illustrated in position to be bound to the album pages. In this binding operation, only one cover will be bound to the pages with the apparatus and the other cover will be bound to this assembly in a separate step.

Referring now to FIG. 8, it will be seen that each album page 125 has an elongate adhesive coated strip or tab 126 folded and applied to the inner longitudinal edge thereof. Each album page as well as the associated hinge mounting for strip 126 has a pair of recesses 127 therein and the hinge mounting strip serves to mount an elongate hinge element 128 against the inner longitudinal edge of the album page. This elongate hinge element 128 is preferably formed from wire and cooperates with the associated page to define the strap confining recesses for accommodating the flexible hinge straps 129. The binding straps 129 are identical to those shown in the embodiment of FIGS. 1 to 6.

The means for engaging the straps pull the same through the strap confining recesses in the album pages includes an elongate mounting member 130 having longitudinally extending openings in opposite end portions thereof. Elongate vertically oriented strap engaging members are secured at their respective lower end portions in the slots 131 by nut and bolt assemblies 134. In this regard, it will also be noted that the lower end portions of the strap engaging members 132 are also provided with longitudinally extending openings 133 therein which permit vertical adjustment of the strap engaging members. These strap engaging members 132 include a pair of substantially flat strap engaging elements or jaws 135 preferably formed of spring metal. The upper end portion of the jaws are arcuately bent as at 136 and the jaw members are slightly spaced apart to accommodate the strap to be gripped therebetween. In this regard, the strap engaging members engage the strap by frictional engagement during the strap binding operation.

A pair of U-shaped guide members 137 are affixed to the longitudinal vertical side 115 of the support structure 111 and provide means for guiding the strap engaging members 132 in their vertical movement. Each of these U-shaped guide members has outturned flanges which are suitably apertured to accommodate the bolt of nut and bolt assemblies 139. These nut and bolt assemblies secure the U-shaped guide members 137 to the support structure along longitudinal openings 140 therein. These longitudinal openings permit the guide members to be longitudinally adjusted relative to each other. Similarly, the longitudinal openings 131 and the mounting member 130 permit the strap engaging members 132 to be adjusted accordingly with respect to the mounting member.

A pneumatic piston and cylinder unit is provided for power shifting the strap engaging media and this unit includes a double acting pneumatic cylinder 141 having a piston therein to which is connected an elongate piston rod 142. The upper end portion of the piston rod 142 is provided with ears 143 which are secured by suitable nut and bolt assemblies to the mounting member adjacent the mid-portion thereof. A bracket 145 is integrally formed with the lower end of the vertically oriented cylinder 141 and is secured to the support surface 113 by suitable bolts 146.

One end of each of a pair of conduits 147 is connected in communicating relation with the cylinder 141 and the respective other ends of these conduits is also connected to a control valve 148. This control valve is controlled by a valve actuator 149 and is connected to a supply of air under pressure by a supply conduit 150. The valve actuator 149 is shiftable in one direction to cause the piston rod 142 to be extended and shiftable in the opposite direction to cause the piston rod 142 to be retracted. Thus the strap engaging media may be power shifted in opposite directions.

From the foregoing description it will be seen that we have provided a novel apparatus for binding album covers and album pages together in a more efficient manner than any comparable apparatus.

It will, of course, be understood that various changes may be made in the form, details, arrangement and pro-

portions of the various parts without departing from the scope of our invention.

What is claimed is:

1. A machine for binding a plurality of flat album pages to the front and rear album covers, each page having a pair of similar hinge elements affixed to one edge thereof and cooperating with the adjacent edge of the associated page to define a pair of strap receiving recesses, each cover having a pair of slots therein adjacent one longitudinal edge thereof, a pair of elongate straps each having one edge thereof secured against movement adjacent the inner surface of one cover and extended upwardly through one of the slots in the cover, said machine comprising,

a support for supporting a plurality of album pages between a front album cover and a rear album cover so that the hinge elements on the pages are arranged in a pair of registering rows,

a pair of similar elongate strap engaging members each having dimensions to permit passage of the strap engaging members through a strap receiving recess defined by a hinge element,

power shifting means,

means connecting said strap engaging members with said power shifting means, said power shifting means being operable to simultaneously shift said strap engaging members through an advanced stroke wherein each strap engaging member projects through the registering strap receiving recesses defined by one row of hinge elements, said power shifting means being operable to simultaneously shift said strap engaging members in a return direction to retract said strap engaging members from said registering rows of strap receiving recesses,

each strap engaging member including a pair of gripping elements for engaging one end of one of the pair of straps whereby the straps will be threaded through the strap defining recesses of the hinge element during the return stroke of the strap engaging members.

2. The machine as defined in claim 1 and guide means for guiding said strap engaging members during shifting movement thereof.

3. The machine as defined in claim 1 wherein said means connecting said strap engaging members with said power shifting means comprises an elongate mounting member.

4. The machine as defined in claim 1 wherein at least one of said gripping elements includes a gripping surface defined by a plurality of teeth.

5. The machine as defined in claim 1 wherein said gripping elements have opposed confronting gripping surfaces, one of said gripping surfaces having a magnet secured thereto and the other of said gripping surfaces being formed of a magnetic material whereby said gripping elements are releasably held together.

6. The apparatus as defined in claim 2 and wherein power shifting means comprises a fluid pressure piston and cylinder unit connected to said mounting member for shifting the same through the advanced and return strokes.

7. The machine as defined in claim 1 and a mounting member, means adjustably mounting said strap engaging members on said mounting member to permit said strap engaging members to be adjusted towards and away from each other, said power shifting means being connected with said mounting member.

8. The machine as defined in claim 1 and a pair of elongate covering positioning members arranged at right angles to each other and being engageable by adjacent edges of album cover to correctly position the cover with respect to said strap engaging member.

9. The machine as defined in claim 8 and a pair of elognate page positioning members mounted on said cover positioning members and extending in right angular relation with respect to each other, said page positioning members adapted to be engaged by the respective adjacent edges of a plurality of album pages to be bound, to thereby correctly position the pages with respect to said strap engaging members.

10. The machine as defined in claim 1 wherein said power shifting means comprises a double acting pneumatic piston and cylinder unit, and a valve for controlling operation of said piston and cylinder unit.

References Cited

UNITED STATES PATENTS

2,227,213	12/1940	Berlanstein	11—1
2,943,336	7/1960	Barrett et al.	11—1

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U.S. Cl. X.R.

402—13