Dec. 29, 1970 J. F. CASTAGNA 3,550,296

PAGE TURNING DEVICE

Filed Sept. 3, 1968 4 Sheets-Sheet 1

FIG. 1

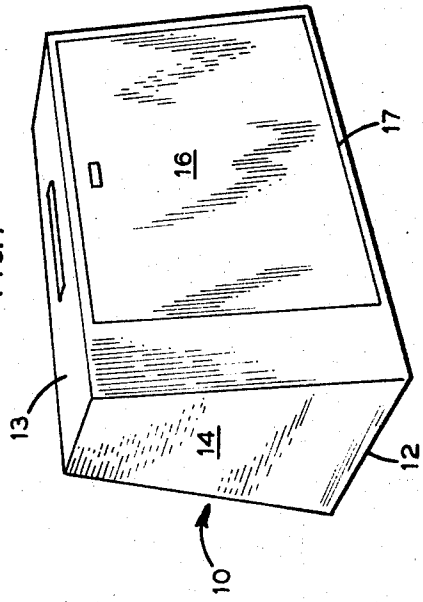
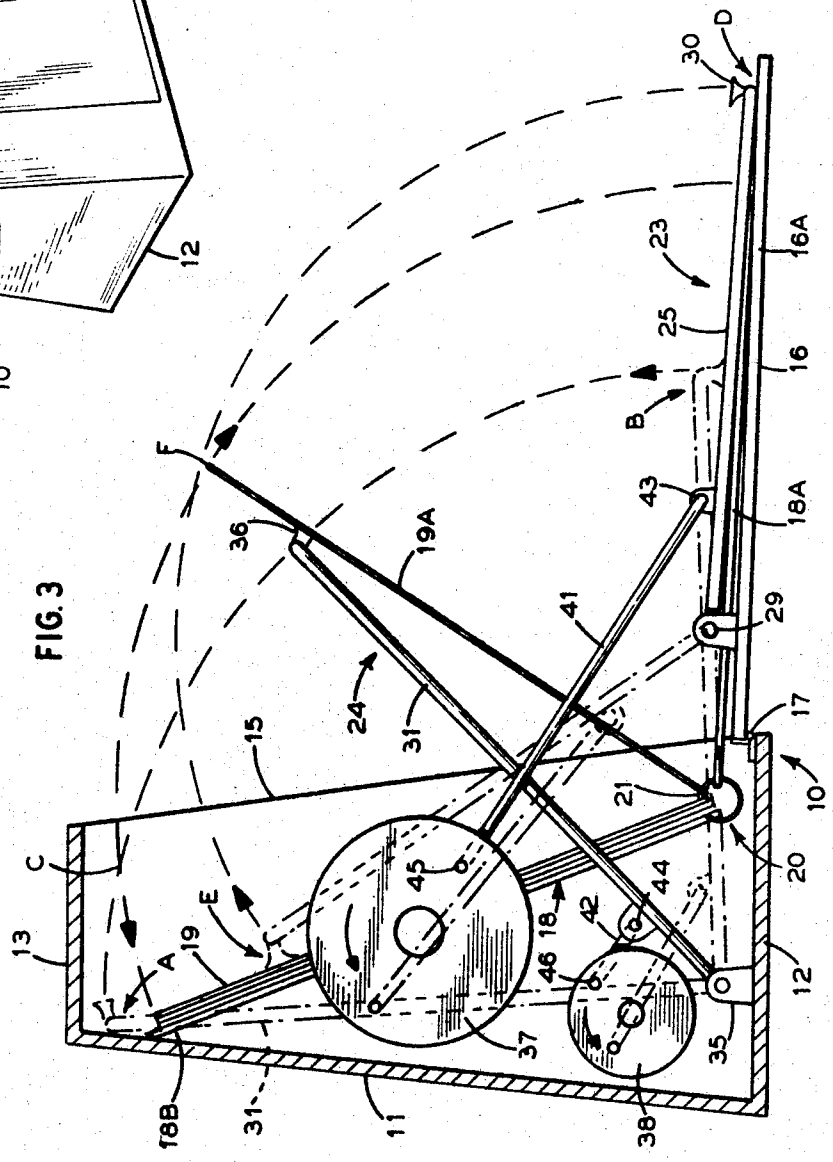


FIG. 3



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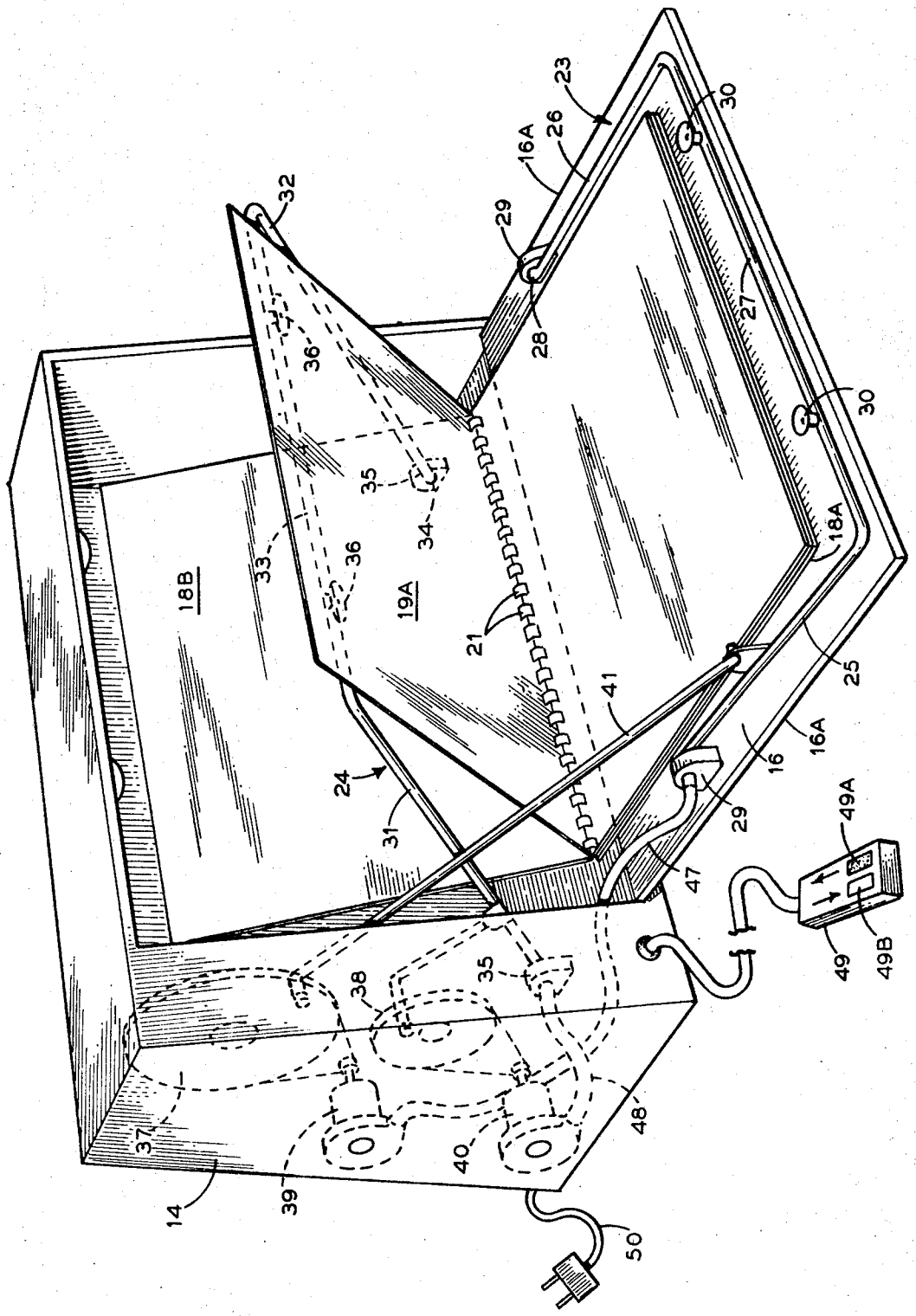

23
30
16A
26
32
29
28
27
36
30
35
34
18A
33
36
18B
19A
21
25
41
16A
16
24
31
29
49A
47
49
49B
38
35
48
37
40
39
14
50

FIG.2

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PAGE TURNING DEVICE

Filed Sept. 3, 1968 4 Sheets-Sheet 3

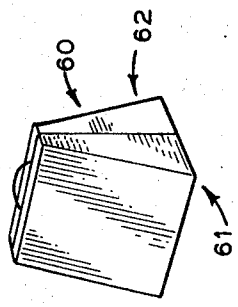


FIG.4

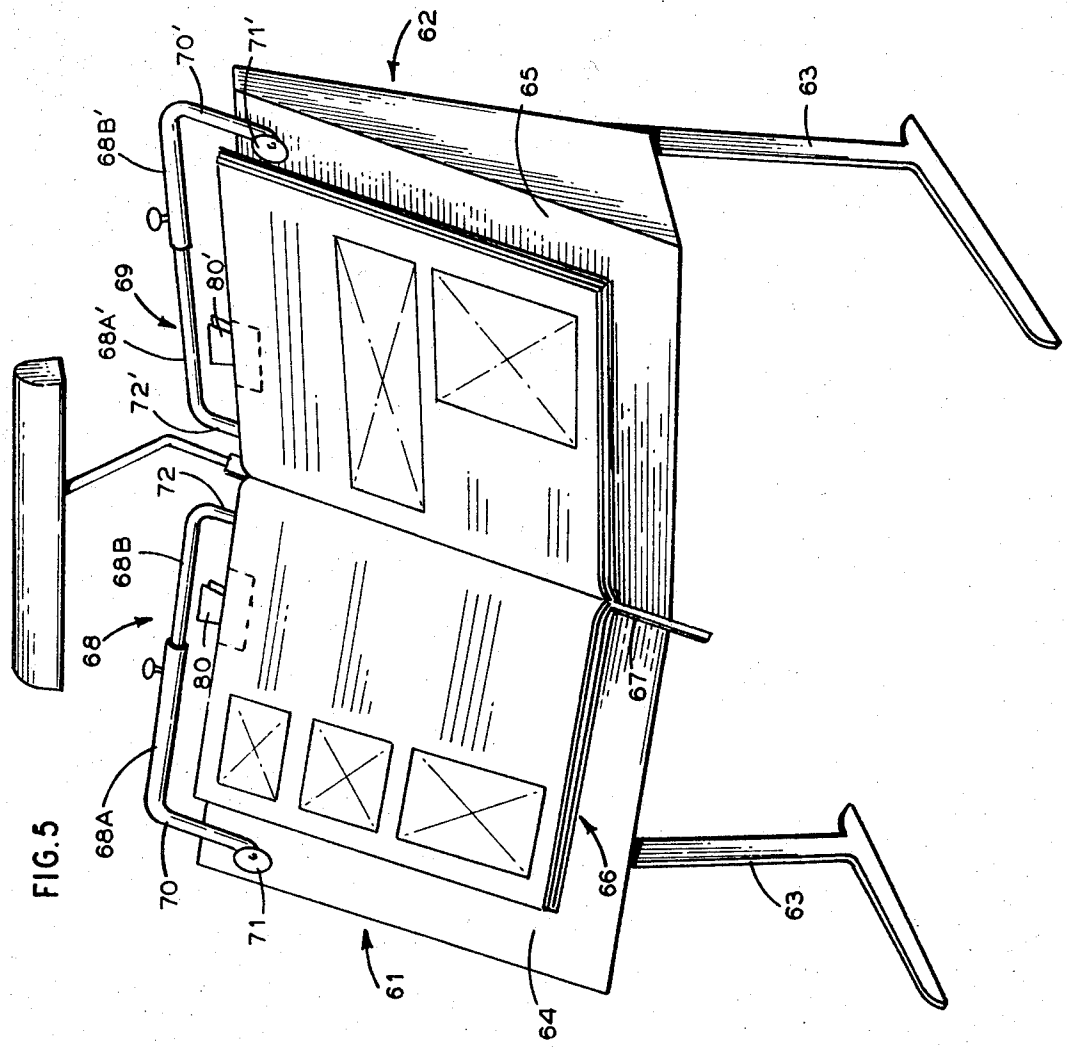


FIG.5

PAGE TURNING DEVICE

Filed Sept. 3, 1968 4 Sheets-Sheet 4

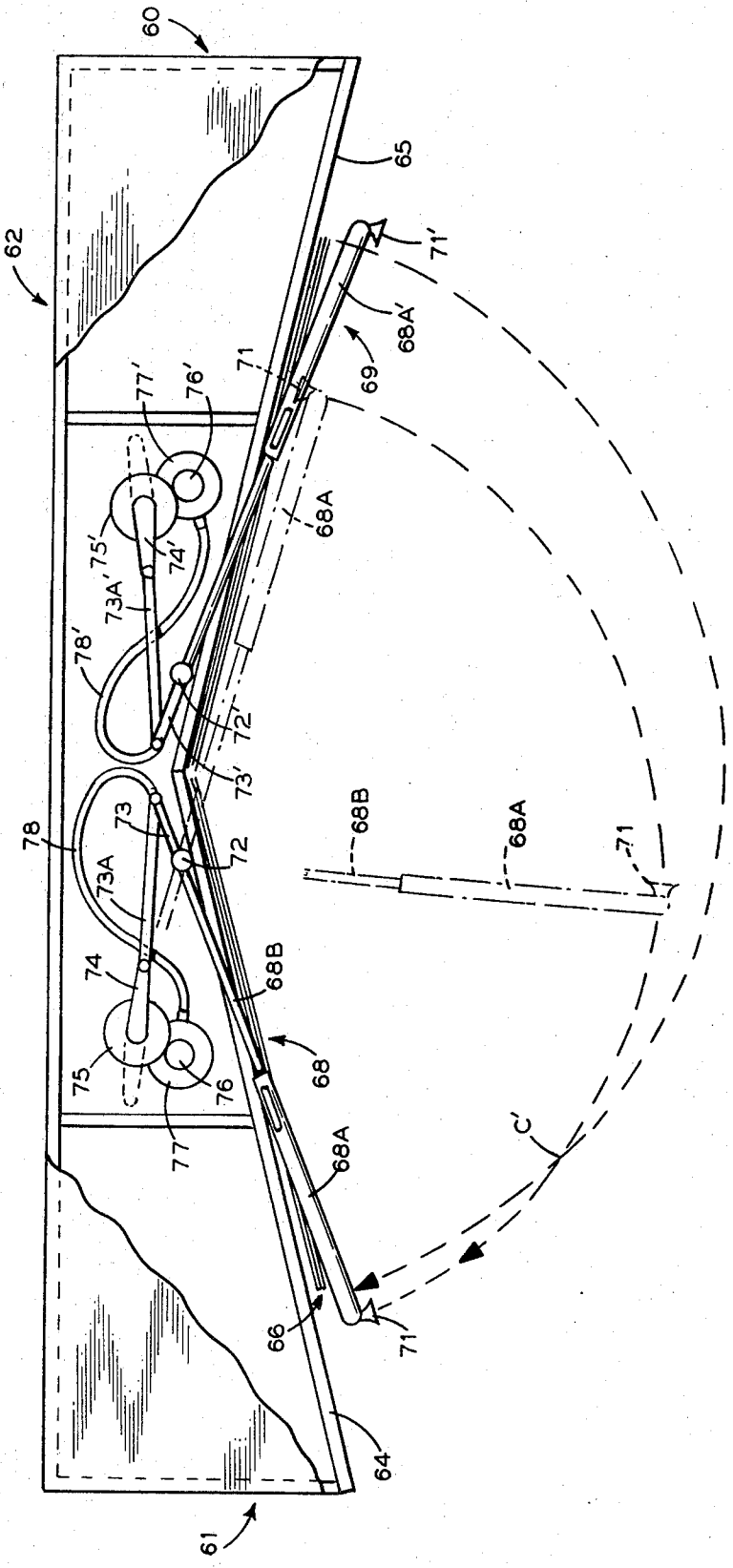


FIG. 6

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PAGE TURNING DEVICE

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U.S. Cl. 40—104 4 Claims

ABSTRACT OF THE DISCLOSURE

A device for turning the pages or leaves of a book, newspaper or the like in either direction, utilizing pivoted arm members operating in conjunction with suction means and arranged to engage and then progressively disengage the turned page or leaf. The device may be adapted for use with the pages or leaves being turned about a horizontal axis as well as the usual substantially vertical axis.

BACKGROUND OF THE INVENTION

A number of devices have been proposed for turning the pages or leaves of a book, music, newspaper or the like. However, it has been found that such known devices have a number of disadvantages. Thus they may be of complicated construction and therefore expensive to manufacture. They may require excessive maintenance to insure good working order. Also, they may be non-uniform in their operation.

Accordingly, an object of this invention is to provide an improved page turning device which is of relatively simple construction, is inexpensive to manufacture, requires little maintenance and is operable in a simple manner with a high degree of efficiency.

Another object of this invention is to provide a device of the character described which includes pivoted tubular arm members which also function as suction conduits, such arm members being movable in paths for engaging and disengaging the page of a book or the like, at appropriate points in the travel of the arm members.

A further object of this invention is to provide a device of the character described which will be effective to turn the pages of a book or the like, when such book is normally positioned with the axis of its spine or bound portions extending horizontally or vertically.

Another object of this invention is to provide an improved page turning device comprising tubular arm members arranged for pivoted movement in a path related to the path of movement of a turning page, the arm members including suction means for engaging a page to turn the same, the angular movements of the arm members and the turning page being so related that the suction means will have a sliding movement over the engaged page and will disengage the page at predetermined angular positions of the page and arm members, the disengaged page then being in a position such that it may continue its movement freely to the end off its travel.

Other objects of this invention will in part be obvious and in part hereinafter pointed out.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view showing a casing in its closed condition for carrying a page turning device embodying the instant invention;

FIG. 2 is a perspective view showing the casing in its open condition and indicating the essential parts of the page turning device;

FIG. 3 is a side elevational view thereof;

FIG. 4 is a perspective view showing a casing for another embodiment of the invention;

FIG. 5 is a perspective view showing the page turning device in its open, ready to operate position; and

FIG. 6 is a top plan view showing the essential operating elements of the device.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

One form of the page turning device embodying the invention is shown in FIGS. 1–3. The same comprises a casing **10** having a back wall **11**, a bottom wall **12**, a top wall **13**, end walls **14**, **15** and a front wall **16** which is hinged along the bottom edge thereof to a forward edge portion of bottom wall **12**, as at **17**. The front wall **16** provides cover means for casing **10**, in the closed position thereof, while in its open, substantially horizontal position it supports a book or the like **18** whose pages or leaves **19** are to be freely turned upwardly or downwardly about the spine portion **20** thereof.

Cover **18A** of book **18** is positioned on open wall **16** with its spine portion **20** adjacent hinge **17**. The other cover **18B** of book **18** is disposed within casing **10** and is tilted rearwardly towards back wall **11**. The spine portion **20** of book **18** includes a spiral wire, molded plastic or other known forms of page binding which permits easy turning movement of the individual pages or leaves **19** of book **18**, and generally indicated at **21**.

Means is provided for turning pages **19** of book **18** upwardly from a horizontal position thereof, or downwardly from a horizontal position thereof, or downwardly from a vertical or substantially vertical position thereof. To this end there is provided a pair of U-shaped tubular arm members **23**, **24** which are pivotally mounted on casing **10** and are of suitable dimensions correlated to the dimensions of pages **19**.

Arm member **23**, having parallel side arms **25**, **26** and a transverse arm portion **27** connecting arms **25**, **26**; has outturned end portions **28** of arms **25**, **26** pivotally mounted in brackets **29** which are affixed to the inner surface of front wall **16** adjacent side edges **16A** thereof and somewhat forwardly of hinge **17**, the side arms **25**, **26** being slightly spaced outwardly of adjacent edges of pages **19**. Suction outlets **30** extend from transverse arm portion **27** at spaced points, for the purpose later appearing. The arm member **23** is thus adapted to move between a horizontal position thereof adjacent the inner surface of front wall **16**, and a vertical position adjacent casing back wall **11**.

Arm member **24**, having parallel side arms **31**, **32** and a transverse arm portion **33** connecting arms **31**, **32**; has outturned end portions **34** of arms **31**, **32** pivotally mounted in brackets **35** which are fixed to bottom casing wall **12** at points rearward of hinge **17**. Suction outlets **36** extend from transverse arm portion **33** at spaced points, for purposes later described. Arms **31**, **32** are adapted to project outwardly of casing **10** to allow for pivoted movement of arm member **24** between vertical and horizontal positions thereof; arms **31**, **32** clearing arms **25**, **26** of arm member **23**.

Pivoted movement of members **23**, **24** is provided by means of pulleys **37**, **38** respectively, which are suitably mounted on horizontal axes within casing **10** adjacent end wall **14** thereof. Pulleys **37**, **38** are belted to small combination electric motors and suction pumps **39**, **40** respectively, suitably mounted within casing **10** adjacent end wall **14** thereof.

Links **41**, **42** are pivotally connected at their forward ends to arm portions **25**, **31** of members **23**, **24**, as at **43**, **44** respectively while their rear angular crank shaped portions **45**, **46** are pivotally connected to appropriate portions of pulleys **37**, **38**. Flexible conduits **47**, **48** connect pumps **39**, **40** to members **23**, **24** through brackets **29**, **35** respectively to provide suction conditions at outlets **30**, **36** of said members **23**, **24**.

Switch means generally indicated at **49** is suitably connected in circuit with motors **39**, **40** and a power supply line **50** which may be plugged into the usual power outlet, not shown, provides control means for selectively actuating members **23**, **24** through suitable operation of switch elements **49A**, **49B**.

Assuming that page **19A** of book **18** is to be lifted from a horizontal position to a vertical position, to thereby turn the same, switch element **49A** is operated to energize motor-pump **40** which is effective to pivot member **24** from its normally vertical position indicated in dot-dash lines at A, through crank pulley **38** and link **42** to a horizontal position indicated in dot-dash lines at B, where suction outlets **36** are effective to engage page **19A**.

Continued rotation of crank pulley **38** causes reverse pivoted movement of member **24** toward its normal vertical position, moving the page **19A** therewith. However, with the lateral displacement of the binding axis **20** relative to the pivot axis of member **24**, the different angular movements of member **24** and page **19A** causes suction outlets **36** to slide over the surface of page **19A** toward the top edge thereof and at a point C in the travel of member **24** and page **19A**, suction outlets **36** will lose contact with page **19A**. At this point, page **19A** is located to the left of the vertical, looking at FIG. 3, thus allowing page **19A** to continue its movement in a counterclockwise direction toward book cover **18B**.

If a page **19** is to be turned in the opposite direction, i.e. from its normally vertical position to a horizontal position, switch element **49B** is operated to activate member **23** which will move from its normally horizontal position indicated at D, FIG. 3 to a vertical position indicated at E to engage through suction outlets **30** the page **19**. The continued rotation of crank pulley **37** will be effective to reverse the pivoted movement of member **23** causing the same to move engaged page **19** downwardly and to disengage said page **19**, as described above at a point F, allowing page **19** to continue its downward movement toward cover **18A**.

In another embodiment of the invention, shown in FIGS. 4–6, the page turning device may be applied to a book, newspaper, magazine, brochure or the like positioned with its binding in a tilted vertical position to allow the pages to be turned about a vertical axis.

Thus, as shown in FIG. 4, the same may be enclosed in a casing **60** comprising hinged sections **61**, **62** which may be opened up and suitably supported on leg members **63**, FIG. 5 to present laterally related supporting surfaces **64**, **65**. A book or newspaper **66** is positioned on supporting surfaces **64**, **65** with the usual spring bar **67** at the binding axis thereof to hold the same in place and to allow all pages to be turned.

The page turning means comprises a pair of U-shaped tubular arm members **68**, **69** mounted in inverted positions in casing sections **61**, **62**, and projecting outwardly of the top thereof. Member **68** comprises horizontal, telescoped sections **68A**, **68B** which may be extended or retracted to suit the dimensions of the pages of book **66**. Outer section **68A** has a short downwardly turned portion **70** at its outer end, which terminates in a suction outlet **71**.

Section **68***b* of member **68** has a downwardly turned portion **72** at its outer end, which is suitably mounted in bracket means, not shown, to provide a vertical pivotal axis for the member. An offset portion **73** at the lower end of portion **72** is pivotally connected to one end of a link **73A**, which is connected at its other end to a crank member **74**.

Crank member **74** is fixed to a drive gear **75** which meshes with a gear **76** connected to a combination motor-suction pump **77**; a flexible conduit **78** connecting the pump with member **68** by way of portion **73**.

Member **69** is similarly arranged for pivoted movement with associated elements corresponding to those

associated with member **68**, described above and carrying corresponding primed reference numerals. Members **68**, **69** are selectively operated through suitable switch means, similar to that described above, to energize the appropriate motor-suction pump **77**, **77'**, to pivot said members into page engaging relation, with continued movement thereof to move the engaged page by way of suction outlets **71**, **71'** from left to right, or from right to left, as desired.

As indicated in FIG. 6, the offset relation of the pivotal axes of members **68**, **69** relative to the binding axis of book **66**, causes the suction outlets **71**, **71'** to slip off the engaged surfaces of the pages at point C' when member **68** is in operation; and similarly when member **69** is in operation. As previously described, the switch control, not shown, is used to select the particular member **68** or **69** for operation in accordance with the direction of page turning desired.

In the case of a book, clamps **80**, **80'** on supporting surfaces **64**, **65** may be used to hold the covers of the book in place.

I claim:

1. A device for turning the pages of a book comprising a base, page turning means mounted on said base for angular movement about an axis parallel to and in displaced relation to the longitudinal axis of the binding of said book, said page turning means comprising a U-shaped member disposed in one position thereof outwardly of the boundary of the pages when said pages are at rest and movable between said one position and a second position, suction means on said member, means for moving said member in one direction from said one position thereof to the other position thereof to dispose a portion of said member in adjacent relation to portions of a selected page and to bring said suction means in engaging relation with said page portions, said moving means being thereafter operative to move said member in the opposite direction together with the engaged page to move said member towards the one position thereof, the concurrent relative angular movements of said member and the engaged page being different whereby said suction means has slidable movement relative to said page and disengages said page at predetermined angular positions of said member and said page before said member returns to the one position thereof.

2. A device as in claim **1** wherein said base comprises a casing having a hinged front wall cover member movable between a closed vertical position and an open horizontal position, said book being supported on said cover member in its open horizontal position with the axis of the binding of the book being parallel to the hinge axis of said cover member to thereby allow the pages of said book to be turned between horizontal and vertical positions thereof.

3. A device as in claim **1** and further including second page turning means mounted on said base for angular movement about an axis parallel to and in displaced relation to the longitudinal axis of the binding of said book, the axes of angular movement of said first and second page turning means being respectively on opposite sides of the axis of said book binding, said second page turning means being movable between two positions thereof, suction means on said second page turning means, means for moving said second page turning means from one position to the other position thereof to dispose said second page turning means in adjacent relation to portions of a page of said book and to bring the suction means associated therewith in engaging relation to said last mentioned book page, said second page turning means being thereafter operative to move in a direction opposite to the direction of its previous movement together with the engaged book page toward the one position of said second page turning means, the concurrent relative angular movements of said second page turning means and the engaged book page being different whereby the suction

means associated with said second page turning means has slidable movement relative to the engaged book page and disengages said book page at predetermined angular positions of said second page turning means and said book page before said second page turning means reaches the one position thereof.

4. A device as in claim 3 wherein said base comprises book support means in tilted relation to the vertical, the book being mounted on the support means with the axis of the book binding in a substantially vertical position, to thereby allow for lateral turning of the pages of said book, the axes of movement of said first and second page turning means being disposed in parallel relation to

the axis of said book binding and respectively on opposite sides thereof.

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L. R. OREMLAND, Assistant Examiner

U.S. Cl. X.R.

40—104.02