July 24, 1956 E. V. JUSTICE 2,755,580

PAGE TURNING DEVICE

Filed Jan. 21, 1953 2 Sheets-Sheet 1

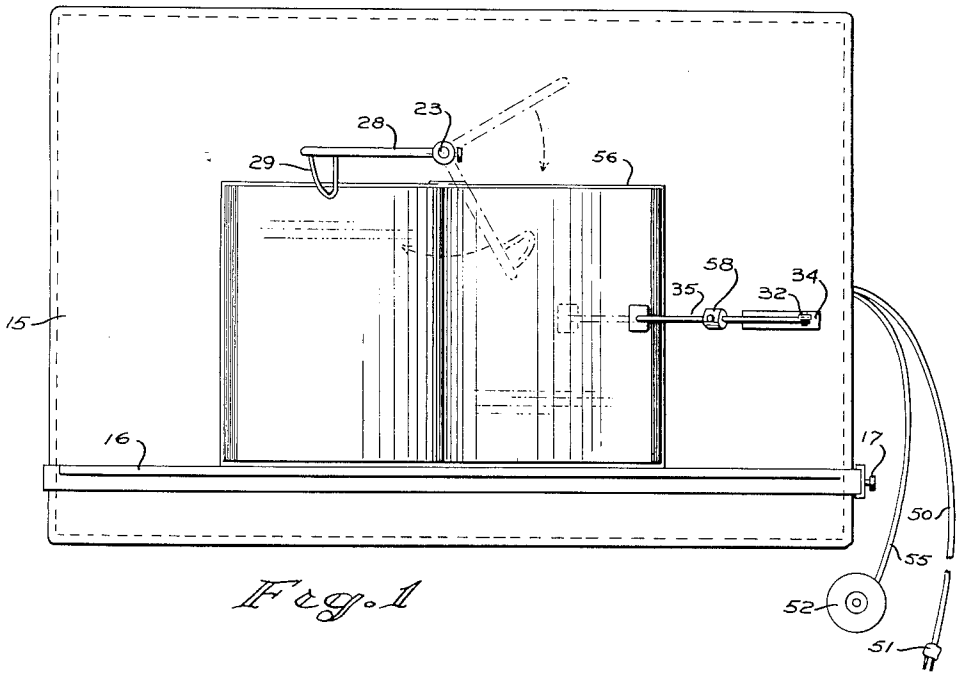


Fig. 1

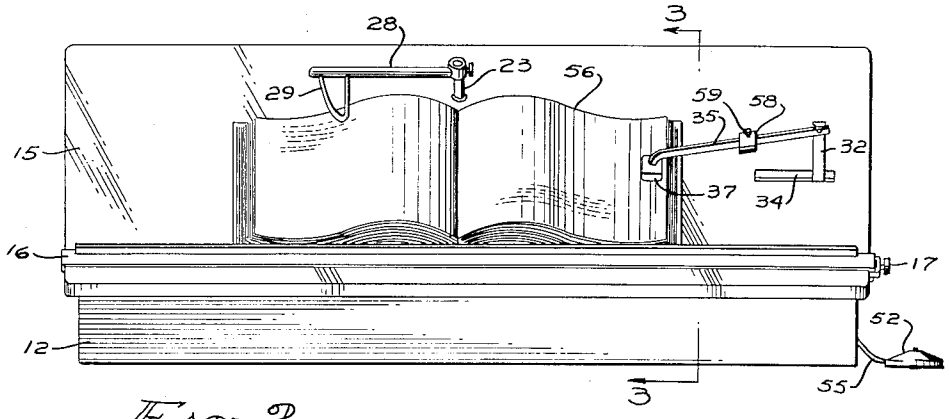


Fig. 2

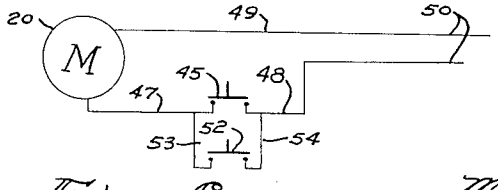


Fig. 6

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Fig. 3

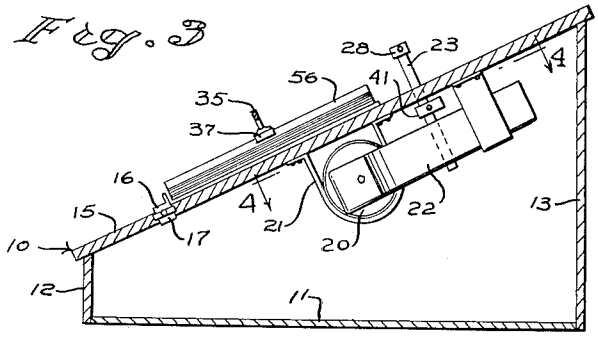
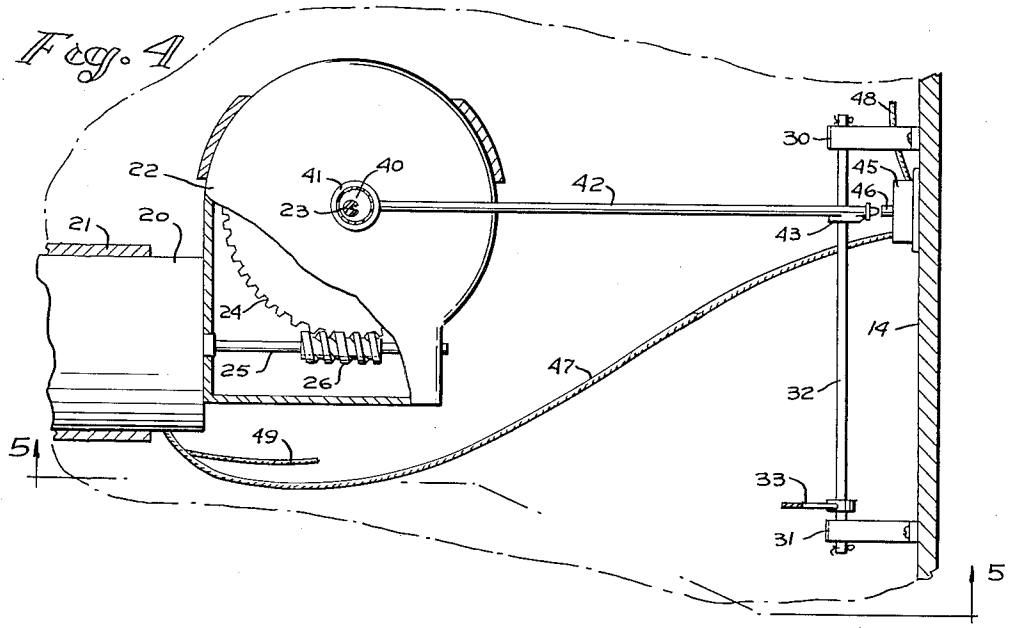


Fig. 4



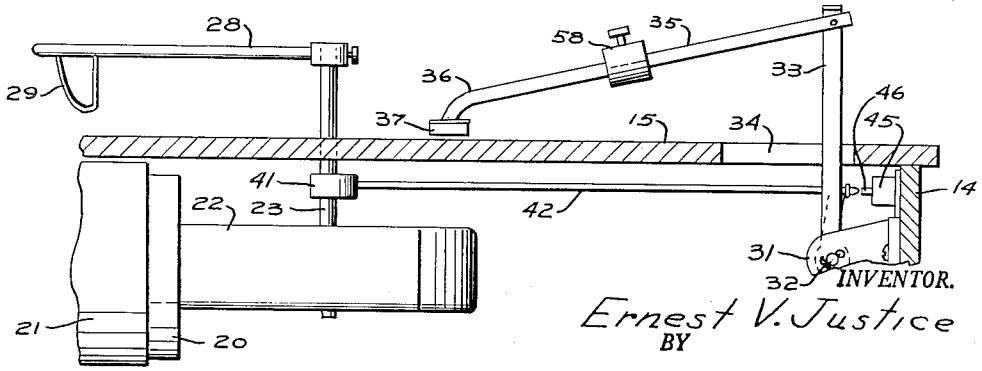


Fig. 5

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PAGE TURNING DEVICE

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Application January 21, 1953, Serial No. 332,466

2 Claims. (Cl. 40—104)

This invention relates to devices for turning the pages of books and more particulary to an electrically operated, manually controlled page turning device particularly useful to persons suffering from paralysis or similar physical incapacity, as the device can be operated by almost any portion of the body still subject to voluntary movement.

It is among the objects of the invention to provide an improved book supporting and page turning device which can be conveniently mounted on a table, desk, bed or chair to support a book in convenient view of a person sitting at a table or desk or occupying a bed or chair; which includes electrically operated page turning mechanism controlled by a push button which can be actuated by almost any voluntarily movable portion of the person's body; which includes adjustable book positioning means so that books of different sizes can be operatively placed on the device; which turns the pages of the book, one by one, without marking or damaging the pages; which has the major portion of the page turning mechanism concealed beneath the book support; and which is simple and durable in construction, economical to manufacture, positive and effective in operation, and neat and attractive in appearance.

Other objects and advantages will become apparent from a consideration of the following description and the appended claims in conjunction with the accompanying drawings wherein:

Figure 1 is a top plan view of a book supporting and page turning device illustrative of the invention;

Figure 2 is a front elevational view of the device illustrated in Figure 1;

Figure 3 is a transverse cross sectional view on the line 3—3 of Figure 2;

Figure 4 is a fragmentary cross sectional view on an enlarged scale on the line 4—4 of Figure 3;

Figure 5 is a fragmentary cross sectional view on the line 5—5 of Figure 4; and

Figure 6 is a wiring diagram of the device.

With continued reference to the drawings, the device comprises a housing, generally indicated at **10**, including a flat bottom wall **11**, a front wall **12** extending along one longitudinal edge of the rectangular bottom wall **11** and disposed substantially perpendicular to the bottom wall, a back wall **13** extending along the other longitudinal edge of the bottom wall and disposed substantially perpendicular thereto, the back wall **13** being substantially parallel to and wider than the front wall **12**. The housing also includes end walls, one of which is illustrated in Figures 4 and 5, and indicated at **14**, extending one along each end edge of the bottom wall **11** and having their upper edges inclined from the top edge of the back wall **13** to the top edge of the front wall **12**, and a flat book supporting platform **15** supported on the top edges of the front, back and end walls of the housing.

The edges of the platform **15** project outwardly beyond the outer sides of the front and back walls and the end walls of the housing, and a book supporting bar **16** extends longitudinally across the top surface of the platform

15 and is slidably engaged at its ends with the projecting end edges of the platform **15**. A screw clamp **17** is carried by the supporting bar **16** at one end thereof and engages the adjacent edge of the platform **15** to releasably lock the supporting bar at selected positions of adjustment transversely of the platform **15**, so that books of different sizes can be operatively supported on the device.

A fractional horsepower electric motor **20** is disposed below the under surface of the platform **15** and rigidly secured to the platform by a U-shaped clamp **21** and a gear housing **22** is mounted on one end of the motor **20**. A shaft **23** is journaled in the housing **22** and carries a worm gear **24** disposed within the housing and the motor shaft **25** extends through and is journaled in the housing **22** and carries a worm **26** which meshes with the worm gear **24** to rotate the worm gear **24** at a reduced speed when the motor shaft **25** is rotated by the motor **20**.

The shaft **23** extends upwardly through an aperture in the platform **15** and an arm **28** is mounted on the shaft **23** at the upper end of the shaft and a resilient shoe **29** is mounted on the arm **28** at a location spaced from the shaft **23**. This shoe **29** preferably comprises a length of spring wire of U shape having its end secured to the arm **28** and being inclined outwardly and downwardly from the arm to press on a top page of an open book supported on the platform **15**, as illustrated in Figures 1 and 2.

Brackets **30** and **31** are mounted on the housing end wall **14** adjacent the under side of the platform **15** and project from the inner side of the end wall. A shaft **32** extends between and is journaled at its ends in these brackets and an arm **33** is mounted at one end on the shaft **32** intermediate the length of the shaft and projects substantially perpendicularly from the shaft through a slot **34** in the platform **15**. An arm **35** is pivotally connected at one end to the arm **33** near the upper end of the arm **33** and extends from the arm **33** toward the shaft **23**. At its end remote from the arm **33** the arm **35** is curved downwardly toward the platform, as indicated at **36**, and a pad **37** of resilient friction material, such as rubber, is secured to the downwardly curved end of the arm **35** and has a friction surface substantially parallel to the top surface of the platform **15**.

An eccentric cam **40** is mounted on the shaft **23** below the platform **15** and a collar **41** surrounds this cam. An arm **42** is secured at one end to the collar **41** and is pivotally connected at its other end to the arm **43** secured on the shaft **32** and extending upwardly from this shaft substantially perpendicular thereto.

A spring closed switch **45** is mounted on the inner side of the end wall **14** and has a plunger **46** disposed in opposition to the end of the arm **42** remote from the collar **41**, and a conductor **47** leads from one side of the motor **42** to this switch. A conductor **48** leads from the other side of the switch **45** and a conductor **49** leads from the other side of the motor and is combined with the conductor **48** into an extension cord **50** extending out of the housing **10** and provided at its end with a plug **51** for reception in a convenience outlet of a house wiring system.

A spring opened, manually closed push button switch **52** is connected at one side to the conductor **47** by a conductor **53** and at its other side by a conductor **54** to the conductor **48** and the conductors **53** and **54** are combined to provide a flexible conductor cord **55** leading from the switch **52** to the switch **45** which is fixedly mounted on the housing wall **14**. The flexible conductor **55** has a length such that the switch **52** can be conveniently placed for operation by various voluntarily movable portions of the body of a person seated at a table or desk or occupying a chair or bed, as explained above.

In the operation of the device, a book as indicated at **56**, is placed on the book supporting platform **15** with the bottom edge of the book against the positioning bar

16 and the bar 16 is then adjusted transversely of the platform until the top edge of the book is a predetermined distance from the shaft 23. The book is then opened, so that the first page of reading matter is exposed and the top page of the rearward portion of the book in the direction of reading is engaged under the shoe 29. The friction pad 37 is placed on the top of the top page of the book at the forward side of the book in the direction of reading, as illustrated in Figures 1 and 2, and the push button switch 52 is disposed at a location convenient to the person reading the book. When the top pages of the book have been read the reader closes the switch 52 momentarily and this energizes the motor 20 and begins the rotation of shaft 23. As soon as the shaft 23 has rotated through a small angle, the arm 42 will be withdrawn from the plunger 46 of the switch 45 permitting this switch to close and continue operation of the motor, even though the switch 52, which is connected in shunt of the switch 45, may have been permitted to open.

As the shaft 23 is rotated, the arm 28 is swung in a clockwise direction, as viewed in Figure 1, moving the shoe 29 away from the top page of the book at the rearward side of the book and swinging the arm toward the top edge of the top page at the forward side of the book, as indicated in broken lines in Figure 1. While the arm 28 is swinging from the top edge of the top page at the rearward side of the book toward the top edge of the top page at the forward side of the book, the cam 40 moves the arm 42 to impart a rocking movement to the shaft 32. This rocking movement of the shaft 32 swings the arm 33 toward the adjacent end of the book and forces the friction pad 37 which is disposed on the top surface of the top page at the forward side of the book toward the center of the book, causing the associated top page to arch upwardly intermediate its length, as indicated in Figure 2. As the rotation of the shaft 23 continues, the arm 28 is swung under the top page of the forward side of the book and, as the shaft rotates to complete a single rotation, the arm 28 turns the top page at the forward side of the book over onto the top page at the rearward side of the book and, when the shaft 23 returns the arm 28 to a position such that the distal end of the shoe 29 is resting upon the newly turned page near the upper end of this page, the arm 42 moves the switch plunger 46 to open the switch 45 and de-energize the motor 20. The device thus turns a single page of the book for each complete rotation of the shaft 23 by the motor 20 and the motor 20 is automatically stopped when it has imparted a complete rotation to the shaft 23.

If it is desired to turn several pages in rapid succession, this can be accomplished by holding the push button switch 52 closed to maintain the motor 20 in continuous operation until the desired number of pages has been turned.

A weight 58 is slidably mounted on the arm 35 and is secured in adjusted position longitudinally of this arm by suitable means, such as the set screw 59, to vary the pressure applied by the friction pad 37 to the top page of the book in accordance with the stiffness and resiliency of the book pages, and other operating conditions.

The invention may be embodied in other specific forms without departing from the spirit or essential characteristics thereof. The present embodiment is, therefore, to be considered in all respects as illustrative and not restrictive, the scope of the invention being indicated by the appended claims rather than by the foregoing description, and all changes which come within the meaning and range of equivalency of the claims are, therefore, intended to be embraced therein.

What is claimed is:

1. A book-supporting and page-turning device comprising: a housing including a flat, book-supporting platform, a rotary shaft projecting out of the housing above the platform, a radial arm secured to the projecting portion of the shaft and rotating in a plane paralleling that of the platform, means mounted in the housing adapted for arching upwardly a page to be turned, to an extent sufficient to permit movement of the arm into a position under the arched page, whereby to turn the page responsive to continued rotation of the shaft and arm, means for turning the shaft through a single cycle of rotation, and means linking the shaft and said page-arching means for joint movement in a predetermined, timed relationship wherein a page is arched once during each cycle of shaft rotation, at that part of the cycle immediately preceding advance of the radial arm into said position, said last-named means including a rock shaft in the housing, a crank arm secured to the rock shaft and projecting above the platform, an arm member on the crank arm weighted to press downwardly upon a page to be arched and having means bearing against the page to arch the same on movement of the arm member in response to rotary motion of the rock shaft and swinging of the crank arm, and a driving connection between the shafts adapted to rock the rock shaft in opposite directions once during each cycle of rotation of the first-named shaft.

2. A book-supporting and page-turning device comprising: a housing including a flat, book-supporting platform, a rotary shaft projecting out of the housing above the platform, a radial arm secured to the projecting portion of the shaft and rotating in a plane paralleling that of the platform, means mounted in the housing adapted for arching upwardly a page to be turned, to an extent sufficient to permit movement of the arm into a position under the arched page, whereby to turn the page responsive to continued rotation of the shaft and arm, means for turning the shaft through a single cycle of rotation, and means linking the shaft and said page-arching means for joint movement in a predetermined, timed relationship wherein a page is arched once during each cycle of shaft rotation, at that part of the cycle immediately preceding advance of the radial arm into said position, said last-named means including a rock shaft in the housing, a crank arm secured to the rock shaft and projecting above the platform, an arm member on the crank arm weighted to press downwardly upon a page to be arched and having means bearing against the page to arch the same on movement of the arm member in response to rotary motion of the rock shaft and swinging of the crank arm, and a driving connection between the shafts adapted to rock the rock shaft in opposite directions once during each cycle of rotation of the first-named shaft, said driving connection including an eccentric on the first-named shaft, a collar circumposed thereabout, an arm secured at one end to the collar for reciprocation responsive to rotation of the first-named shaft, and a crank member connected to the other end of the last-named arm and extending radially from the rock shaft to rock the same responsive to reciprocation of said last-named arm.

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