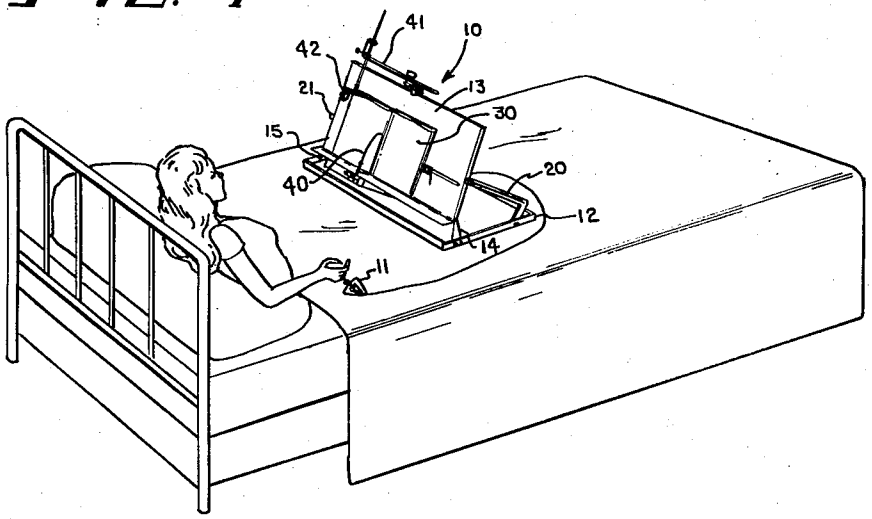
Aug. 4, 1959 C. H. RUSSELL 2,897,618

AUTOMATIC PAGE TURNING APPARATUS

Filed Nov. 13, 1956 2 Sheets-Sheet 1

FIG. 1



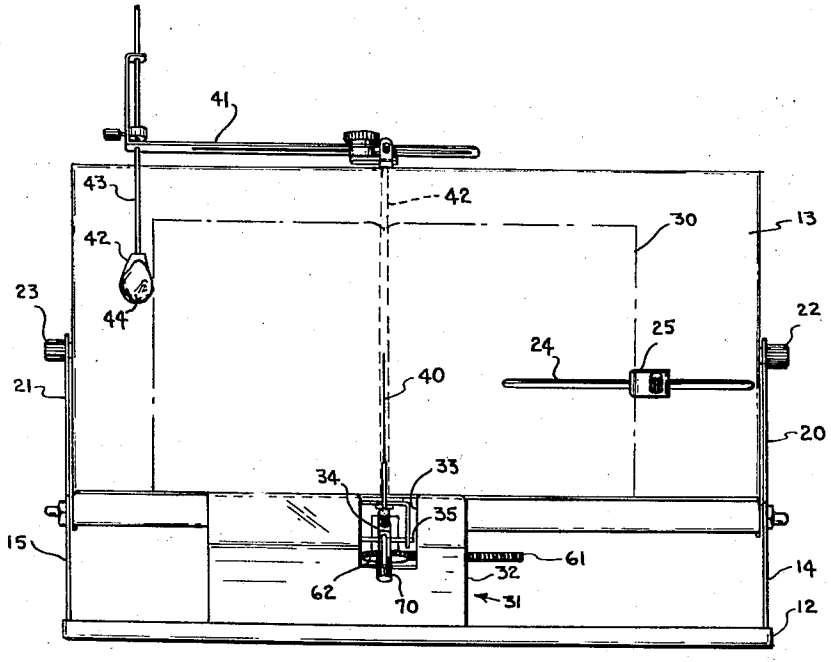


FIG. 2

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FIG. 3

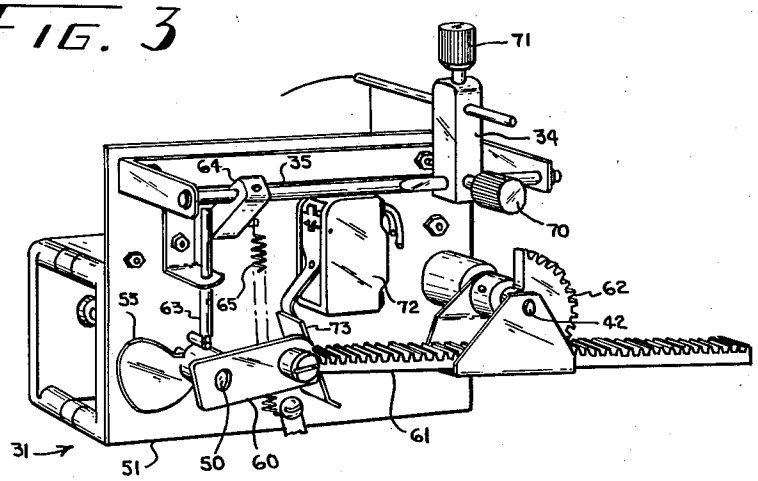


FIG. 4

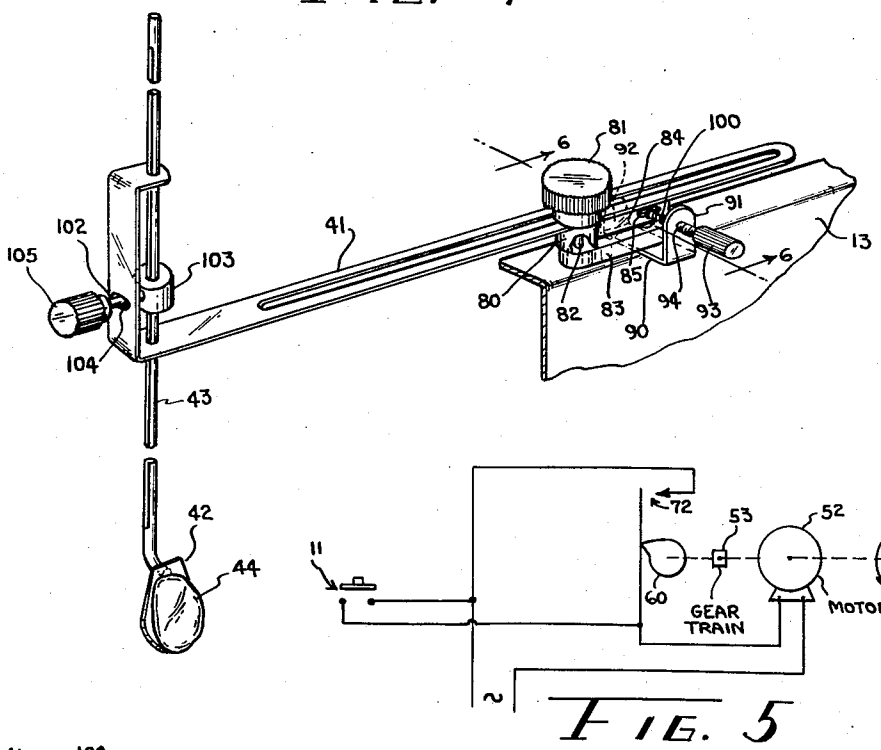


FIG. 5

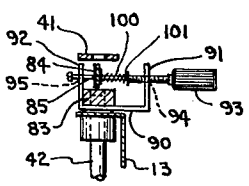


FIG. 6

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AUTOMATIC PAGE TURNING APPARATUS

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Application November 13, 1956, Serial No. 621,879

1 Claim. (Cl. 40—104)

The present invention is concerned with an improvement in an automatic page turning apparatus primarily an improved adjusting device for varying the pressure applied to the gummed pressure foot which sticks to the individual pages and is a part of the turning device.

While there have been automatic page turning devices on the market for many years for assisting invalids to turn pages of a book or a magazine, there has been a need for an inexpensive and satisfactory device to attach each individual page to a turning arm.

Heretofore, when a gummed pressure foot was used, the force applied to the pressure foot was dependent upon the thickness of the book. The pressure foot loading depended upon how far it had to move with respect to the book support table. The pressure would be high at first for a thick book and then as the pages were turned and the book became smaller the pressure on the foot would be less. While a constant pressure at all times is not particularly desirable, as the stickiness of the gum varies with temperature and humidity, it is desired to have an easily adjustable pressure.

The present invention has a simple and inexpensive adjustable pressure device so that the application pressure of the pressure foot against the page is always adjustable.

It is therefore an object of the present invention to provide an improved pressure adjusting device for an automatic page turning apparatus.

This and other objects of the present invention will become apparent upon a study of the following specification and drawings, of which

Figure 1 is a schematic representation of the present invention,

Figure 2 is a front view of the automatic page turner apparatus,

Figure 3 is a lower view of the drive mechanism of the page turner,

Figure 4 is a perspective view of the adjustable pressure device of the pressure foot,

Figure 5 is a schematic drawing of the electric control circuit, and

Figure 6 is a more detailed view of the apparatus of Figure 4.

One particular use of the present invention is shown in Figure 1 where a person confined to bed has only a slight amount of control over one arm. A page turner 10 has a control switch 11 which is operated by the person upon a slight movement of an arm. A horizontal platform or base 12 supports a sloped platform 13. The sloped platform is attached at the lower edge to base 12 by a pair of support brackets 14 and 15 so platform 13 can pivot thereabout. A second pair of brackets 20 and 21 attached to base 12 are adjustably attached to the opposite vertical edges of platform 13. Brackets 20 and 21 can be securely fastened to platform 13 by associated lock nuts 22 and 23, respectively, as shown in Figure 2.

Referring to Figure 2, a horizontal slot 24 in platform

13 holds an adjustably positioned page clamp 25 which is tightened to hold the end pages of a magazine 30 to the slope platform. Gear box 31 attached to the lower part of platform 13 has a cover 32 with an open portion 33 exposing a moveable arm 34. Arm 34 pivots about a horizontal shaft 35 to lift a wire loop holding device 40, shown in Figure 1, from the magazine whenever a page is turned.

As shown in Figures 1 and 2, an arm 41 is attached to an upper end of a shaft 42 extending upward along platform 13 from the gear box. Arm 41 is adjustable in length. A page attaching device or pressure foot 42 is attached to the outer extremity of arm 41 by means of a shaft 43. Thus as arm 41 moves from left to right across the top of platform 13, shaft 43 which is parallel to platform 13 carries foot 42 over the magazine and against the surface of the right hand page. A sticky gum or adhesive material 44 is placed on foot 42 so that it will attach to the right page of the magazine and upon a return movement of arm 41 the page will be carried along to the left.

Referring to Figure 3, the gear box is shown in detail. A shaft 50 journalled through a base 51 is rotated counterclockwise at approximately six revolutions per minute. The power for shaft 50 is obtained from a conventional motor 52 and a reduction gear train 53 behind base 51, not shown in Figure 3. Splined on shaft 50 is an assembly of a cam 55 and an arm 60. Attached to the outer extremity of arm 60 is a gear rack 61 which engages a gear segment 62 attached to shaft 42, also journalled through base 51. Upon movement of arm 60 through one revolution, gear segment 62 and shaft 42 rotate through a 180 degree angle, this providing the aforementioned movement for arm 41 across platform 13.

A cam follower 63 engaging cam 55 is attached to an arm 64 fastened to shaft 35 so that upon the counterclockwise rotation of cam 55 it will lift follower 63 near the end of a revolution. This upward movement lifts holding device 40 off the magazine 30 as heretofore mentioned. Arm 64 is biased downward to hold follower 63 against cam 55 by a spring 65.

Arm 34 is adjustable on shaft 35 in a horizontal direction as shown in Figure 2 so loop 40 can be properly located on the magazine. Arm 34 is secured to shaft 35 by a screw 70 as shown in Figure 3. Loop 40 is also adjustable in a vertical direction as shown in Figure 2 to be raised or lowered on the magazine. The loop holding device is locked in place on arm 34 by a screw 71.

A switch 72 is normally open when operating arm 73 is depressed by arm 60 in the starting position, as shown in Figure 3. After a selected movement of arm 73 in a counterclockwise direction upon closing switch 11, switch 72 closes a holding circuit to maintain operation of motor 52. The circuit is shown in Figure 5.

Referring to Figures 4 and 6, pressure foot driving arm 41 is attached to a member 80 by a nut 81. Member 80 is pivotally supported on a pin 82 attached to the outer extremity of arm 83. Member 80 has a projecting member 84 which has a hole 85 at the extreme end. A bracket 90, which is a part of the arm 83 and attached thereto at the extremity of arm 83 opposite pin 82, has a pair of upward projecting ears 91 and 92. A screw 93 is received by aligned holes 94 and 95 in ears 91 and 92, respectively and passes through hole 85 of member 84 extending between the ears. When shaft 42 rotates arm 83 and bracket 90 move therewith to move arm 41 from left to right, as shown in Figure 4. Upon pressure foot 42 moving against the right page of the magazine, arm 41 stops rotating; however, shaft 42 is adjusted to continue its movement in the same direction. Member 84 is then moved toward

ear **91**. A spring **100** is placed on screw **93** between member **84** and ear **91** so that it is compressed between member **84** and a shoulder **101** on screw **93**. As screw **93** is advanced into the threaded hole **94** in ear **91** the spring is compressed against member **84**. Thus the force applied to pressure foot **42** can be adjusted by the initial compression placed on spring **100** by screw **93**. As foot **42** engages the magazine and member **84** moves toward ear **91** further loading of spring **100** takes place to increase the pressure of foot **42** on the page. By selecting the initial loading of spring **100** for a certain thickness of the magazine, the pressure of foot **42** can be adjusted and the gummed material **44** can give its best performance in adhering to the page throughout the operation of the page turner.

Shaft **43** is held with respect to arm **41** by a screw **102** received into a collar **103** on shaft **43**. Screw **102** projects through an elongated hole **104** in the U-shaped portion of arm **41** so that shaft **43** can be moved through a small angle. Pressure foot **42** will then pull away from the page when it is in the turned position under the weight of the enlarged head **105** of screw **102**.

Operation

With a magazine in position on platform **13** as shown in Figures 1 and 2, the page turning apparatus is ready for operation. A few of the last pages of the magazine are placed under clamp **25** to hold the magazine in place. The length of arm **41** and shaft **43** are adjusted. Upon closing switch **11** motor **52** is energized through the circuit shown in Figure 5. As arm **60** moves counterclockwise, referring to Figure 4, gear rack **61** drives shaft **42** so that arm **41** moves from left to right across the magazine.

As pressure foot **42** presses the gum material **44** against the upper right portion of the page, it will stick thereto so that the page is turned as arm **41** returns to the initial position on the left side of the magazine, as shown in Figure 2. Upon the return movement of arm **41**, cam **55** through follower **63** lifts holding device **40** off of the magazine until the page is turned. By placing the magazine on platform **13** so that the center binding is slightly to the right of the shaft **42** the length of arm **41** can be longer than the width of a page. Thus as the pressure foot moves to the initial position it will tend to pull the page to the left and

gummed material **44** will release the page. The weight of head **105** of screw **102** will rotate the pressure foot to the left and it will be out of the way of the page and be ready for the next operation.

When arm **41** moves to the right and pressure foot **42** pressures gum **44** against the page, initially the pressure on foot **42** depends upon the compression force of spring **100** which can be changed by screw **93**. When foot **42** contacts the page in the extreme right hand position, shaft **43** continues to move arm **83**, as shown in Figure 4, counterclockwise. This further compresses spring **100** between member **84** and shoulder **101**. By the initial loading on spring **100**, the pressure applied to foot **42** and the gum material is selected. This is important as the temperature and humidity greatly change the pressure foot effectiveness in attaching to the pages.

Therefore, I claim:

In an automatic page turning device, a sloped platform adapted to support a book, a driving motor, a pivoted arm extending in a plane normal to said platform at an upper edge of said platform, means connecting said motor to said arm, a second arm pivotally mounted on an extremity of said first arm and extending in said plane, a pressure foot attached to one extremity of said second arm, said pressure foot comprising a predetermined amount of soft adhesive material whereby upon said pressure foot contacting the surface of a page of the book said foot will adhere thereto to lift a page upon a reverse movement of said second arm, said foot changing shape with excessive pressure upon engaging said page, and adjustable spring means for connecting said first and second arms, said spring means limiting the force that can be exerted by said motor in moving said pressure foot against the page thereby preventing the deformation of said material.

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