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WEB GUIDE SWITCH

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Fig. 1.

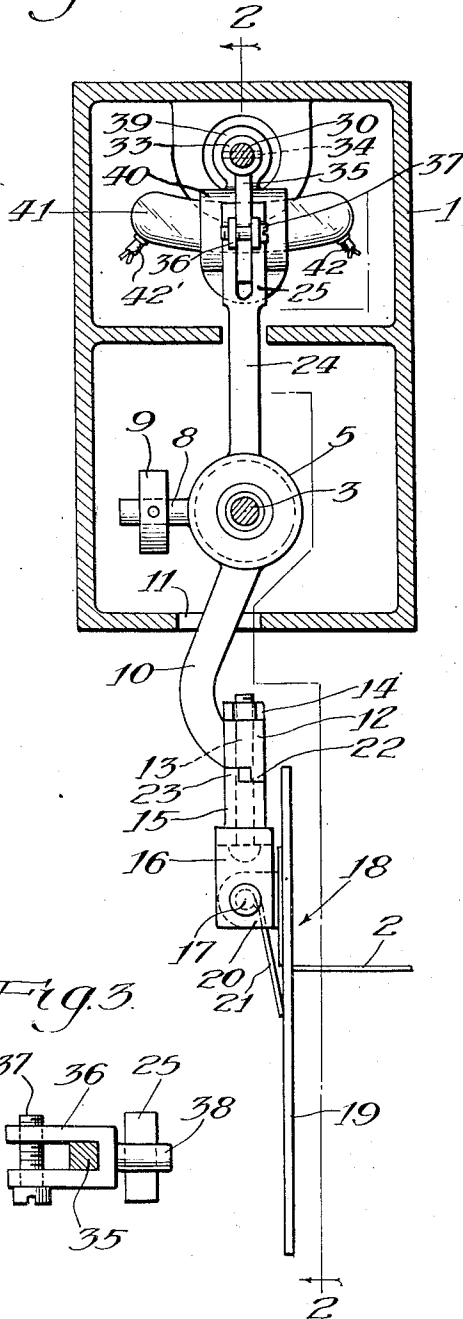
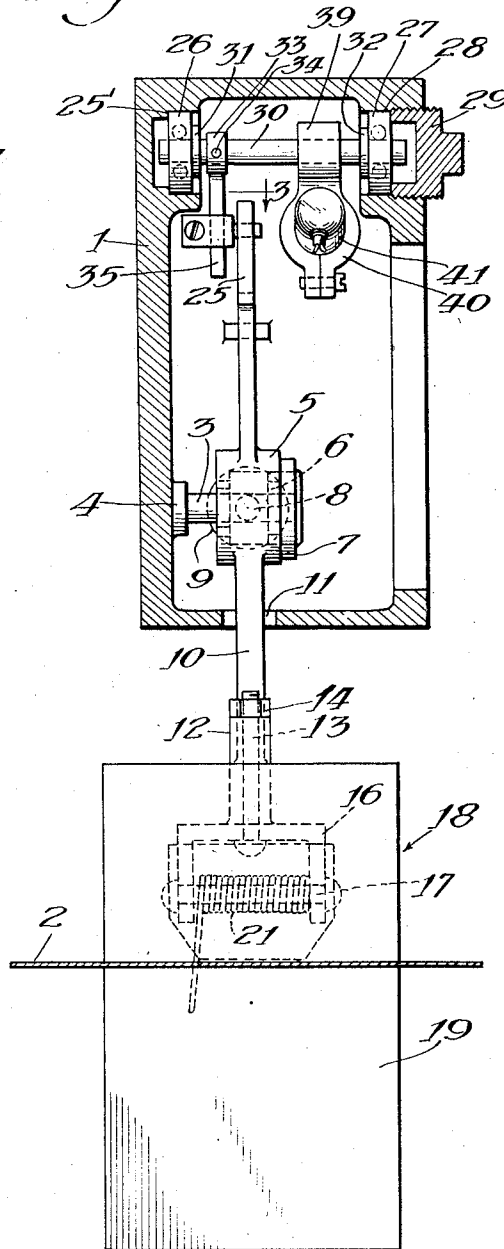


Fig. 2.



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UNITED STATES PATENT OFFICE

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WEB GUIDE SWITCH

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2 Claims. (Cl. 200—52)

This invention relates to improvements in feeler palms for electrically operated web guiding or shifting devices, and refers specifically to a feeler palm which is characterized by its high sensitivity and means for controlling the sensitivity thereof.

In the guiding of continuously advancing webs, paper forming wires, belts and the like electrically operated shifting means has heretofore been proposed, such as that shown and described in my co-pending application for patent, Serial No. 19,157, filed May 1, 1935. The shifting means, of course, acts to laterally move a web, wire or belt to a desired line of travel. To actuate the shifting means a feeler palm is usually employed which is disposed adjacent the edge of the traveling web, wire or belt and is moved in response to lateral movement of the web, wire or belt when the same tends to depart from the desired line of travel.

In guiding webs, particularly light weight paper or fabric webs, difficulty has frequently been encountered in that the palm tends to injure the web by crumpling, tearing or otherwise injuring the edge of the web. This results primarily from the degree of force necessary to displace the palm from its normal position. If, however, a too sensitive or too light acting palm is used with heavier webs, unsatisfactory results are obtained. In other words, for a given weight paper or fabric web there is a corresponding ideal palm mechanism, having a desired degree of sensitivity.

One of the features of my invention resides in the provision of a palm mechanism which can be adjusted to change the degree of sensitivity of the palm or the force necessary to actuate the switch mechanism operated by the palm.

Other objects and advantages of my invention will be apparent from the accompanying drawing and following detailed description.

In the drawing, Fig. 1 is a view partly in section of my improved palm mechanism.

Fig. 2 is a sectional view taken on line 2—2 of Fig. 1.

Fig. 3 is a detailed sectional view taken on line 3—3 of Fig. 2.

Referring in detail to the drawing, 1 indicates a housing or casing which is disposed adjacent the edge of a traveling web 2. A pin or stub shaft 3, carried by support 4 which in turn is mounted upon an inner wall of the casing 1, extends inwardly from, and at right angles to said wall. A hub or journal 5 is pivotally mounted upon pin 3, and ball bearings or other type frictionless bearing 6 is carried by hub 5, being conducive to easy rotatable movement of said hub

upon shaft 3. The hub 5 and bearing 6 are maintained upon shaft 3 by means of nut or collar 7.

A pin 8, formed integral with hub 5, extends outwardly from said hub and carries a weight 9 which may be adjustably positioned along the length of pin 8. As will be hereinafter more fully described, the weight 9 on shaft 8 functions as a counterweight to facilitate movement of hub 5 about shaft 3.

An arm 10 is carried by hub 5 and, if desired, may be formed integral therewith, said arm being adapted to extend downwardly from hub 5 through an aperture 11 provided in the bottom wall of casing 1. The bottom end of arm 10 comprises a journal 12 in which bolt 13 is carried, said bolt being threadedly connected to nut 14. A sleeve 15 is carried on bolt 13 and is adapted to be disposed immediately beneath journal 12. The sleeve 15 comprises a portion, preferably an integral portion, of a bifurcated member 16, each of the arms of which is provided with an aperture through which pin 17 extends.

The bifurcated member 16 carries a palm 18 which comprises a flat plate 19 preferably constructed of metal. Spaced lugs 20 are carried on the rear face of plate 19, said lugs being apertured and being connected to the bifurcated member 16 by pin 17. A spring 21 embraces pin 17 and one end thereof bears against the rear face of the plate 19 and tends to rock the plate in a counterclockwise direction, as viewed in Fig. 1. In practice the front face of plate 19 is adapted to contact the edge of the traveling web 2 under the influence of weight 9 and spring 21.

To insure contact of the entire width of plate 19 and the edge of the web 2, the plate 19 has limited rotative movement about the vertical pivot comprising bolt 13. To limit such movement, the journal 12 is provided with a depending lug 22, and the sleeve 15 is provided with an upwardly extending lug 23, which, when the palm is rotated an excessive degree, contact each other and serve as stops.

An arm 24 is also carried by hub 5 and is preferably formed integral therewith. Arm 24 is disposed opposite from arm 10, and in this case, extends upwardly in casing 1. The upper end of arm 24 terminates in a bifurcated or slotted member 25.

The upper portion of one of the inner walls of casing 1 is apertured, as at 25', to receive the outer race of a ball bearing 26. The opposite wall of the casing is provided with an opening 27 in which the outer race of another ball bearing

28 is positioned. A portion of the defining surface of opening 27 is threaded to receive the threads of plug 29. A shaft 30 is rotatably carried by the inner races of the bearings 26 and 28 and the shaft is rendered immovable longitudinally by means of collars 31 and 32 which abut, respectively, bearings 26 and 28.

A collar 33 is keyed to shaft 30 by means of pin 34, and carries a downwardly extending arm 35. A U-shaped clamp 36, illustrated in Fig. 3, embraces arm 35 and may be adjustably secured, along the length of arm 35 by means of screw 37 which is threadedly engaged with the spaced arms of the clamp. A pin 38 mounted upon clamp 36 extends outwardly therefrom and is adapted to be positioned in the slot provided in the bifurcated member 25 carried at the end of arm 24.

A collar 39 is secured to shaft 30 and is adapted to rock therewith, said collar terminating in a depending clamp 40 which is adapted to carry a closed glass tube 41. The tube 41 is provided internally at each end with a pair of electrodes (not shown) and also carries a quantity of mercury. The tube 41 constitutes a conventional mercury switch and the electrodes at each end are connected to conductors 42 and 42'. The conductors 42 and 42' are connected to a suitable electric web shifting device such as that shown and described in my co-pending application for patent hereinbefore identified.

In operation, the casing 1 is disposed adjacent the path of travel of an edge of the web 2 and is so positioned with respect to the web that plate 19 contacts the edge of the web. The normal position of the plate 19 is such that it has a degree of horizontal swingable freedom to permit the plane of the plate 19 to conform with the line of the edge of the web 2. Under normal circumstances the palm 18 bears upon the edge of the web only under the influence of the counterweight 9. However, to prevent injury to the web or palm when the web shifts excessively to the left, as viewed in Fig. 1, the spring 21 is provided which permits restrained movement of the palm in a counterclockwise direction.

It is manifest that when the web 2 shifts to the right or left, the palm 18 follows its movement and hence hub 5 rocks about bearing 6 and shaft 3. This rocking motion is in turn imparted to arm 24 which contacts pin 38, moving arm 35 and shaft 30. When shaft 30 is thus rocked, the mercury bridges the electrodes at one end of the tube 41 energizing the shifting means (not shown) which latter causes the web 2 to return to its normal line of advance.

It will be noted that all of the rotating members which are associated with the swinging of the palm mechanism are ball bearing so as to provide a minimum of friction. This feature, of course, is of importance since the edge of the web bears the brunt of moving the mechanism and if the system offered appreciable frictional resistance the web would be injured, particularly if it were of light weight. By the provision of the counterweight 9, the average pressure of the palm upon the edge of the web can be adjusted to a desired value. However, as a feature of my invention a further adjustment is provided which not only provides a control for the force necessary to move the palm but provides a means whereby the degree of displacement of the

web from its desired line of travel may be controlled with respect to the period when the web shifting mechanism is brought into operation.

The latter means comprises the adjusting clamp 36 which associates the arm 24 and the arm 35. It can readily be seen that when the clamp 36 is adjacent the upper portion of the arm 35, a relatively great movement of arm 24 will cause a relatively small movement of the shaft 30, and conversely, when clamp 36 is adjacent the lower end of arm 35 a relatively small movement of arm 24 will cause a relatively great movement of shaft 30. Considered in terms of web movement, in the first instance above, relatively little resistance will be offered by the palm to movement of the web, but the web shifting mechanism will not be set into operation until the web has been displaced a relatively large degree. In the second instance, the palm will offer greater resistance to movement of the web, but slight movement of the web will set the web shifting mechanism into operation.

The palm mechanism herein described offers a range of adjustments which have heretofore been unattainable and is ideally adapted for the guiding of relatively delicate fibrous or fabric webs where fine adjustment is necessary to satisfactory efficient operation.

I claim as my invention:

1. A feeler mechanism for a web guide which comprises, a support, a member pivotally mounted intermediate its length upon said support, a palm carried at one end of said member, means for maintaining said palm in contact with the edge of a continuously passing web, a swingable element mounted upon said support, an electric switch carried by said swingable element adapted to operate a web shifting device when moved a predetermined degree, and adjustable means connecting said swingable element to the opposite end of the pivotally mounted member, whereby the mechanical advantage of said swingable element with respect to said pivotally mounted member is changed and a predetermined degree of lateral movement of said web causes said swingable element to move said switch a predetermined degree.

2. A feeler mechanism for a web guide which comprises, a support, a member pivotally mounted intermediate its length upon said support, a palm carried at one end of said member, means for maintaining said palm in contact with the edge of a continuously passing web, a movable element upon said support, an electric switch carried by said movable element adapted to operate a web shifting device when moved a predetermined degree, and adjustable means connecting said movable element to the opposite end of the pivotally mounted member, whereby the mechanical advantage of said swingable element with respect to said pivotally mounted member is changed and a predetermined degree of lateral movement of said web causes said movable element to move said switch a predetermined degree, said adjustable means comprising a pin adjustably carried upon said movable element adapted to contact said pivotally mounted member at a desired point away from its pivotal mounting.

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