Sept. 1, 1953 H. E. COOPER 2,650,825

PAPER JOGGER

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FIG. 1.

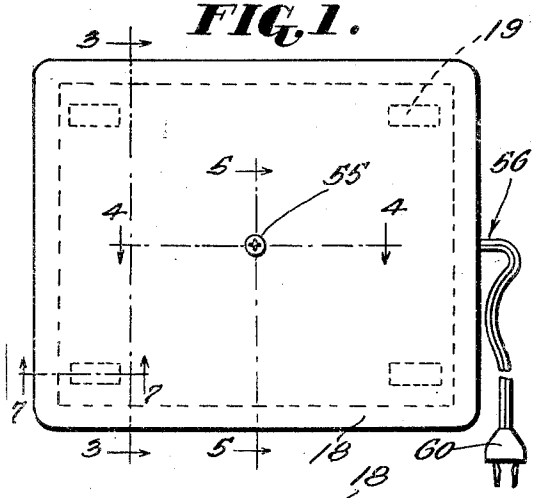


FIG. 8.

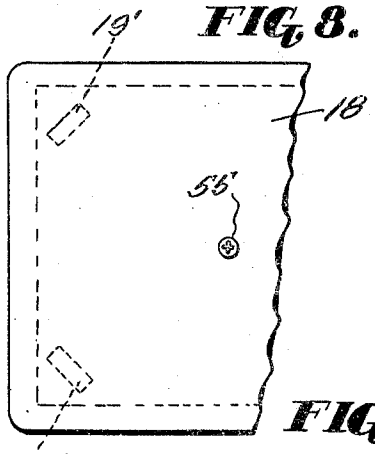
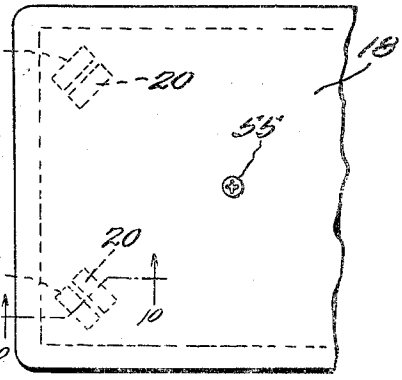


FIG. 9.



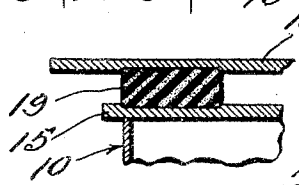


FIG. 10.

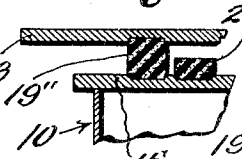
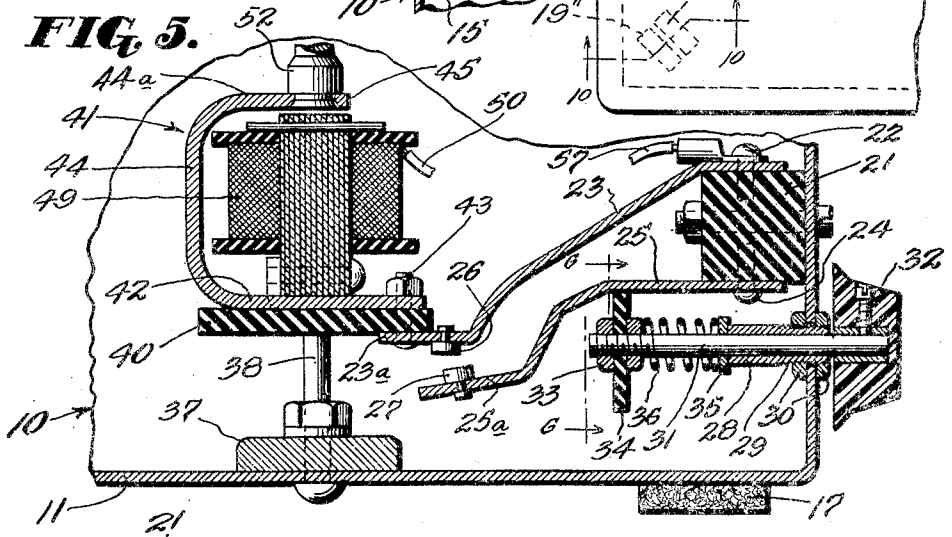


FIG. 7.

FIG. 5.



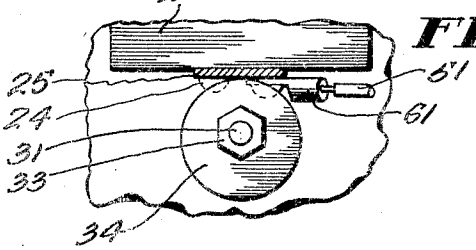


FIG. 6.

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FIG. 2.

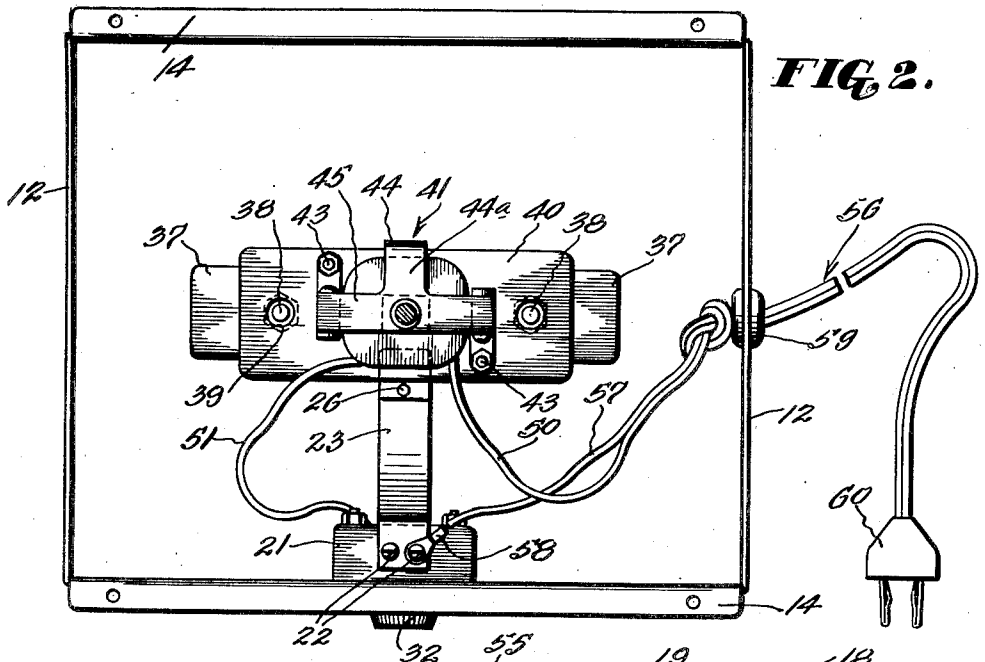


FIG. 3.

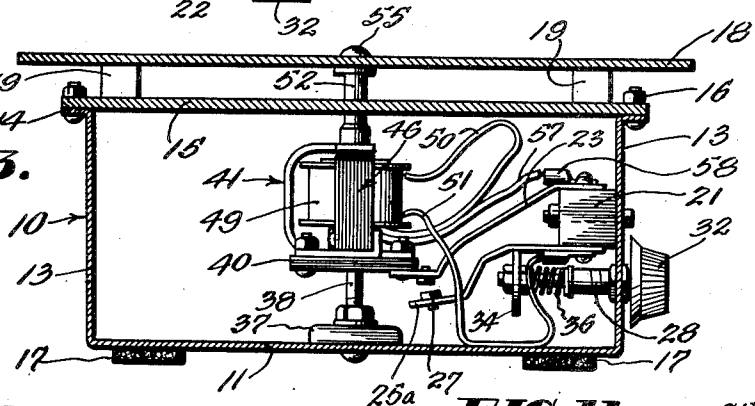


FIG. 4.

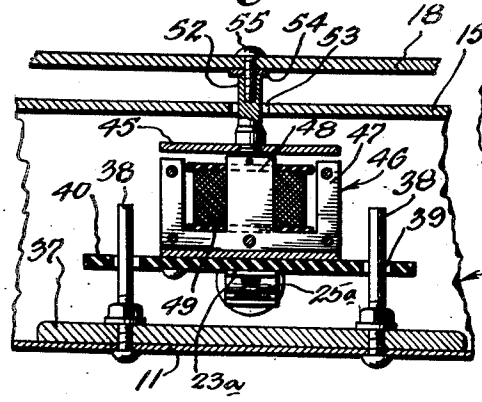
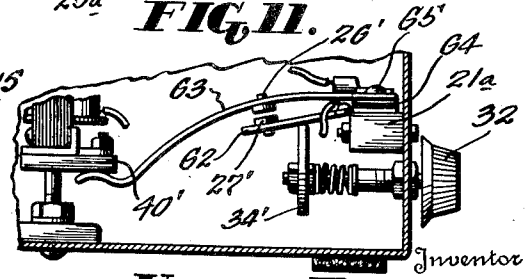


FIG. 11.



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PAPER JOGGER

Harold E. Cooper, Tulsa, Okla.

Application April 20, 1950, Serial No. 157,059

1 Claim. (Cl. 271—89)

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This invention relates generally to electrically operated vibrating devices and is directed particularly to improvments in joggers for use in straightening or evening the edges of stacks of paper sheets.

In many offices, small printing shops, and other establishments, it is frequently necessary to straighten the sheets in a stack of papers and this is customarily done by lifting and dropping the sheets on edge, or "jogging" the same, on a desk top or other flat surface. Equipment is obtainable for doing this work mechanically but it is relatively expensive owing to the use of complicated mechanism and accordingly small printing shops and other small business establishments are usually unable to afford such equipment and the work is accordingly done by hand.

It is a principal object of the present invention to provide a simple, efficient and economical jogger by means of which the straightening or evening of the edges of the paper sheets in a stack may be accomplished quickly and with a minimum of effort.

A further object of the present invention is to provide an improved paper jogger which is constructed to function automatically upon the placing thereon of necessary weight of paper, without requiring that the operator turn on or off controlling switches for the electrical mechanism by means of which the jogger is actuated.

Another object of the invention is to provide an automatically operated paper jogger which is started or put into operation by placing a sufficient weight of papers thereon and which is automatically stopped upon the removal of the weight.

Still another object of the invention is to provide apparatus for accomplishing the above stated results with means whereby static electricity may be automatically removed from the paper sheets during the jogging operation so that the sheets will not stick or cling together and may accordingly be more easily shifted and straightened.

A still further object of the invention is to provide in a paper jogger of the character stated, a means whereby the mechanism may be adjusted to respond to different weights of paper stacks so that after it has once been set for use in association with paper stacks of a predetermined size it will thereafter continue to function automatically each time a stack of such size is placed thereon and removed therefrom.

Other objects and advantages of the invention will become apparent as the description of the

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same proceeds and the invention will be best understood from a consideration of the following detailed description taken in association with the accompanying drawings, with the understanding, however, that various changes and modifications may be made in the invention within the scope of the appended claim.

In the drawings:

Figure 1 is a view in top plan of a paper jogger constructed in accordance with a preferred embodiment of the present invention.

Figure 2 is a view in top plan of the device with the cover plate and jogging platform removed, showing the mechanism within the casing, the platform post being shown in section.

Figure 3 is a front to rear section taken in a vertical plane substantially on the line 3—3 of Figure 1,

Figure 4 is a vertical section taken substantially on the line 4—4 of Figure 1.

Figure 5 is a vertical section taken substantially on the line 5—5 of Figure 1.

Figure 6 is a detailed section taken substantially on the line 6—6 of Figure 5 showing the adjusting means for the control switch.

Figure 7 is a detailed section taken substantially on the line 7—7 of Figure 1.

Figure 8 is a view in top plan of the jogger showing a modified or altered arrangement for the resilient supporting elements for the platform.

Figure 9 is a partial top plan view of the jogger showing another arrangement or modification of the resilient supports for the platform.

Figure 10 is a detailed section taken substantially on the line 10—10 of Figure 9.

Figure 11 is a detailed view showing a modification of the switch setting and adjusting mechanism.

Referring now more particularly to the drawings the numeral 10 generally designates a casing or housing in which the operating mechanism for the jogger is encased. As shown this casing or housing comprises a bottom wall 11, side or end walls 12 and front and rear walls 13.

Two of the walls, here shown as the front and rear walls 13, have portions of the top edges thereof turned outwardly to provide flanges 14 and overlying the open top of the housing and resting upon the flanges 14 is a top wall or cover plate 15 which is removably secured to the flanges 14 by suitable securing elements 16 here shown as nuts and bolts.

While the construction thus far described is preferred it is to be understood that the inven-

tion is not restricted to the specific arrangement and means for maintaining the top wall 15 in place as, obviously, other arrangements might be employed without departing from the spirit of the invention.

The top or cover plate 15 is preferably formed of some non-metallic material such as wood, pressed fibre board or the like, while the body of the housing may be made of aluminum or any other suitable material, not necessarily metal as it will be readily apparent that other materials such as plastics or the like may be employed.

Since the jogging device is light in weight and relatively small and therefore is adapted to be moved about to be placed upon a desk top or counter, it is preferred that suitable pads or cushion feet 17 be secured to the under side of the bottom 11 so as not to mar any surface upon which the device may be placed.

The numeral 18 designates a top deck or platform which is of greater width and length or depth than the top 15 of the housing and which is maintained over and in spaced relation with the top 15 in the manner as shown and about to be described. This platform 18 is preferably made of some material which is nonconductive of electricity such as fibreboard, wood, plastic or the like and is supported adjacent its four corners, upon the housing top wall 15 by resilient elements 19 which may be of any suitable character but are preferably in the form of blocks of sponge rubber. It is to be understood, however, that the use of a generic term in the claim to define these resilient supports is intended to cover sponge rubber or rubber of any other character of any other suitable resilient supporting members interposed between the platform and the top wall 15, which will serve the desired purpose.

In the embodiment of the invention as illustrated in Figure 1 it will be seen that the resilient bodies 19 are in the form of rectangular blocks, each set at one corner of the platform and positioned to have its long sides paralleling the front and rear walls of the housing.

Another arrangement for the resilient bodies 19 is illustrated in Figure 8 where it will be seen that the bodies, here designated 19', may be disposed each across the corner adjacent to which it is located while in Figures 9 and 10, still another arrangement is shown wherein a resilient supporting block of rectangular form, here designated 19'', is disposed across each corner of the top wall 15 and adjacent to and positioned inwardly from each block 19'' is a second resilient block or body 20 which rests upon or is secured to the top of the wall 15 but is of less height than the adjacent block 19'' which joins the platform and wall. By the provision of the additional cushion or support 20, if abnormally heavy loads of paper are being jogged, a compression or downward movement of the platform to an undesirable extent is prevented.

Within the housing there is secured to the inner side of the forward or front wall, a body 21 of suitable insulation material, to the top of which is firmly fixed by means of a screw 22, an inwardly and downwardly extending switch arm 23, the free inner end of which arm terminates in the flat, substantially horizontally disposed foot 23a.

To the under side of the block 21 is fixed by the screw 24, an end of a lower switch arm 25 which extends inwardly below the arm 23 in a substantially straight line for a part of its length and has the downwardly and inwardly extending inner end portion 25a, the free end of which is disposed beneath the free end portion 23a of the upper switch arm.

The portions 23a and 25a of the switch arms, carrying the contact members 26 and 27 respectively which are arranged to have a normally spaced relation as shown in Figures 3 and 5, are only brought into electrical connection one with the other upon the imposition of a load upon the platform 18, as hereinafter described.

Means is provided whereby the spacing between the terminals 26 and 27 may be changed or adjusted as desired, such means being as follows:

A sleeve 28 has a threaded end portion 29 which is extended through a suitable opening in the forward wall 13 of the casing, directly beneath the switch blades 23 and 25 and this sleeve is secured rigidly in position by the clamping nuts 30 which are threaded onto the sleeve at the inner and outer sides of the wall so that the wall can be gripped therebetween and thus the sleeve 28 maintained rigidly in position within the casing below the insulation body 21.

Extending through the sleeve 28 is a shaft 31 upon the outer end of which is secured the knob 32 by means of which rotation of the shaft may be effected.

Within the casing the inner end of the shaft 31 has secured thereon between the clamp nuts 33 which are threaded onto the shaft, an eccentric disc or cam 34 of insulation material, the periphery of which cam bears against the underside of the straight portion of the switch arm 25 at a substantial distance inwardly from the body 21. Interposed between a washer 35 surrounding the shaft at 31 and bearing against the inner end of the sleeve 28, and the adjacent clamp nut 33, is an expansion spring 36 which normally urges the shaft 31 inwardly so as to maintain the eccentric disc 34 at its innermost position beneath the straight portion of the switch arm or blade 25.

It will be seen from the foregoing that by turning the shaft 31 upward thrust may be applied to the switch arm 25 to shift the contact 27 with respect to the contact 26 thereby altering the spacing between the contacts as may be required.

At the approximate center of the casing there is disposed upon the floor or bottom wall 11 a strip of material 37 of suitable thickness to which are secured the lower or headed ends of two upstanding guide pins 38, which pins also extend through the bottom wall 11 as most clearly shown in Figure 4. These pins 38 are spaced apart in the direction of the width of the casing and they extend through apertures 39 formed through and adjacent to the ends of a long flat plate 40 of insulation material, upon which is mounted and secured an alternating current type vibrator unit which is generally designated 41.

The vibrator unit 41 comprises a metal base plate 42 which is bolted to the insulation plate 40 as indicated at 43 and formed integral with the plate 42 is the upstanding resilient substantially C-shaped yoke 44 which has the horizontally disposed upper end portion 44a which carries the long armature bar 45, the portion 44a of the yoke being joined to the armature bar 45 at one side of the latter and approximately midway between its ends as is clearly shown in Figure 2.

Disposed upon the metal base plate 42 of the vibrator unit is a laminated magnet frame 46 which comprises the upstanding end arms 47 and the central core portion 48. Within this frame

and encircling the core 48 is the magnet coil 49 with the two ends of which are connected the current conducting wires 50 and 51.

The vibrator unit and the insulation plate 40 rest upon the end portion 23a of the switch blade 23. This switch blade or arm 23 supports the unit and upstanding guide pins 33 function to prevent the unit from turning or rotating.

It will also be seen upon reference to Figure 4 in particular that the armature bar 45 lies above the ends of the frame arms 47 and the core 48 and are normally in spaced relation with the same.

Secured to the armature bar 45 centrally between its ends, is an end of an upstanding post 52. This post extends through the opening 53 in the top wall plate 15 and abuts the underside of the platform 18 through the medium of a suitable washer 54 although it may abut directly against the platform as will be readily apparent.

The upper end of this post 52 has a tapped bore therein into which is threaded the shank of a screw 55 which passes through the platform 18 and has its head exposed upon the top of the platform as shown in the several figures. This screw 55 which is of current conducting metal and in electrical connection with the metal post 52, has a double function. One function is, of course, to establish a firm coupling between the platform 18 and the armature bar 45 through the medium of the post 52 and its second function is to serve as a means for carrying off static electricity from the paper sheets as they are being jogged and straightened on and by the machine platform.

The current conduction wire 50 forms one of the usual pair of wires of a current conducting two-wire cable 56 while the other wire of such cable, designated 57 is electrically connected as indicated at 58 with the switch arm 23, through the medium of one of the two securing screws 22. As illustrated in Figure 2 the cable 56 is extended through a suitable bushed opening at 59, in a side wall of the casing and connects with a plug 60 of the usual two-prong type commonly employed for connecting a current conducting cable to a standard type of outlet fixture.

The current conductor 51 which is connected to the other end of the wire coil 49, is electrically connected as indicated at 61 with the lower switch arm 25 through the medium of one of the two screws 24 by which such arm is secured to the insulation body 21.

Figure 11 illustrates another or modified arrangement of the spring arms forming a part of the switch structure. In this arrangement the arms are supported upon a block 21a of insulation material, corresponding to the block 21 and the lower arm 62 of the switch assembly, is relatively short and has one end positioned upon the top of the block 21a. The upper or longer arm as designated at 63, has one end disposed upon a block 64 of rubber or suitable insulation material, which block overlies the end of the arm 62 and the two arms together with the block of insulation 64 are secured to the supporting block 21 by screws 65.

The free inner end of the upper long spring arm of the switch unit has the insulation plate 40' of the vibrator unit bearing thereupon as illustrated. The eccentric disc by means of which the spacing between the switch points or terminals 26' and 27', is altered, is designated 34' and the means for operating the same is of the same construction as that shown and described in connection with the structure illustrated in Figures 3 and 5.

In the operation of the jogger the switch points 26—27 or 26'—27', may be given a tentative setting by rotation of the control eccentric wheel 34 or 34', to have a slightly spaced relation and a quantity of paper sheets then placed on edge upon the top of the platform 18 to effect compression or downward movement of the platform against the resilient support of the members 19. Since the vibrator unit is essentially suspended from the platform, this downward movement of the platform will also effect downward movement of the unit and if the quantity of paper is of sufficient weight the vibrator will be moved downwardly until the switch points are brought together whereupon electrical energy will be caused to flow to the vibrator coil and a rapid vibration or up and down movement will be imparted to the platform 18 to effect the desired jogging of the paper sheets. If the quantity of sheets is insufficient to bring the contacts together more sheets may be added or the adjusting eccentric can be turned to force the contacts closer together, as may be desired and after the desired setting is obtained then the work may be continued without having to change the setting and without having to bother with the turning on or off of the electric current since this is accomplished automatically through the weight of the paper placed upon the platform.

As is well known paper sheets when shifted relative to one another, particularly as in the process of discharging the sheets from a printing press onto a stack where one sheet slides over the surface of another, static electricity is produced which tends to cause the sheets to cling or stick together so that their rearrangement may be somewhat difficult.

By the provision of the metal screw or contact 55 which projects above the top of the platform 18 and is electrically connected with the underlying metallic parts, such static electricity may be eliminated from the sheets by the operator using the device passing the paper load edge back and forth over the screw head or button while the sheets are being jogged, thereby causing a rippling or combing action through the paper. Thus, as previously pointed out, the screw by having its head raised above the top of the platform, performs the two functions of coupling the platform to the vibrator and forming a means for draining or leaking off the static electricity from the paper sheets as they are being jogged.

Since the surface area of the platform is very large as compared to the surface of the screw head, there is ample room upon any side of the screw head or button for normal jogging as will be readily apparent.

I claim:

In a paper stack jogger, a rectangular casing having an open top, a cover for the open top of the casing and having a central opening therein, a platform positioned above the cover, a post depending from the platform through the said opening in the cover, a pair of spaced vertical guide pins secured in the bottom of the casing, a plate of an insulating material slidably engaged on the guide pins, an armature bar supported horizontally on the lower end of the post, an electromagnet supported on the plate beneath the armature bar, resilient means connected with the armature bar and urging movement of the armature bar away from the electromagnet, a block of an insulating material secured within the casing at one side of the electromagnet, a spring contact arm secured at one end to the block

and having its other end engaged beneath the plate to support the electromagnet in position with respect to the armature bar to effect vertical jogging movement of the bar, the post and the platform upon intermittent energization of the electromagnet, a second spring contact arm also secured at one end to the block and having its other end disposed beneath the said other end of the first contact arm in spaced relation with respect thereto, the coil of the electromagnet and the contact arms being electrically connected in series with each other, means for connecting electric current conductors with the contact arms, and means operable from the outside of the casing for adjusting the spacing between the free end portions of the contact arms, said platform being given a rapid up and down movement upon application of sufficient pressure to the top thereof to flex the first contact arm into electrical contact with the second arm whereby to energize the electromagnet when said current conductors are connected with a source of electric potential.

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