

Jan. 10, 1950

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2,494,075

PAPER JOGGER

Filed March 18, 1946

3 Sheets-Sheet 1

Fig. 1

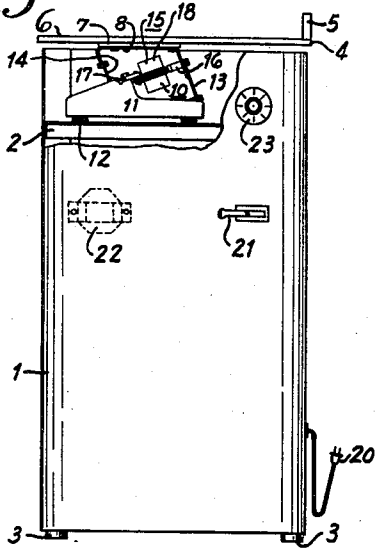


Fig. 4

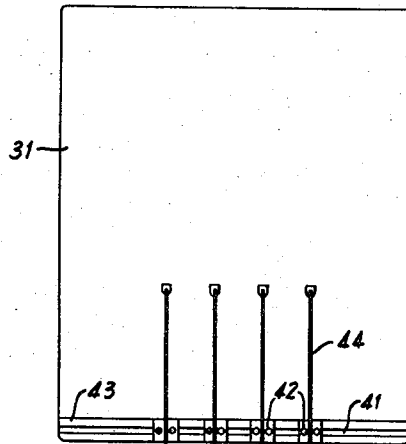


Fig. 2

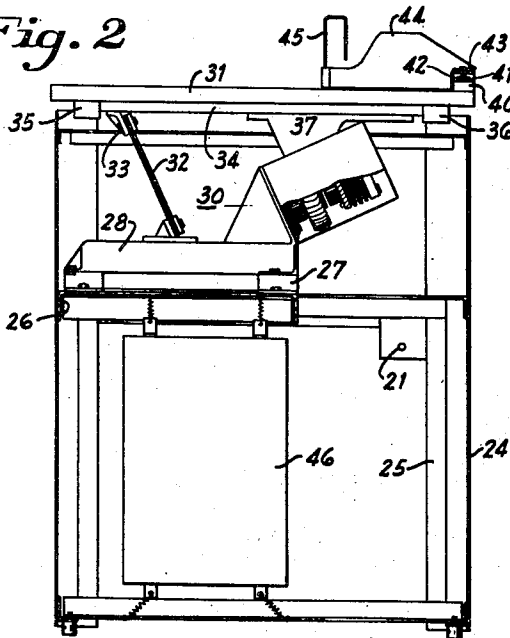
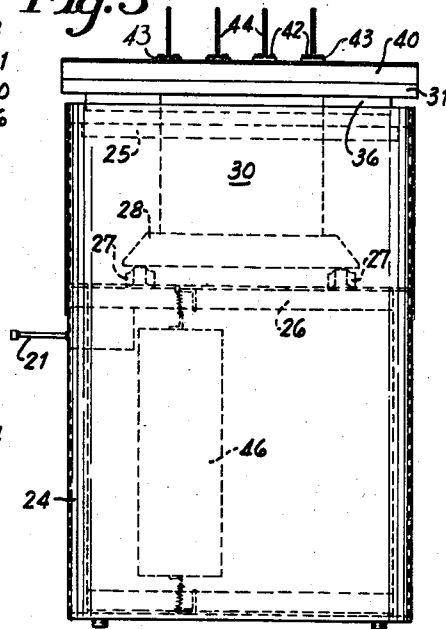


Fig. 3



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Fig. 6

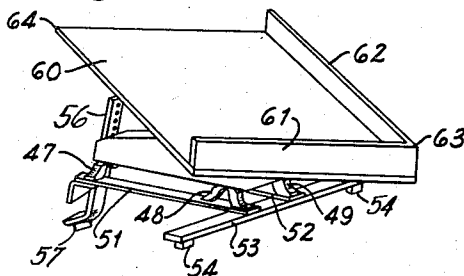


Fig. 5

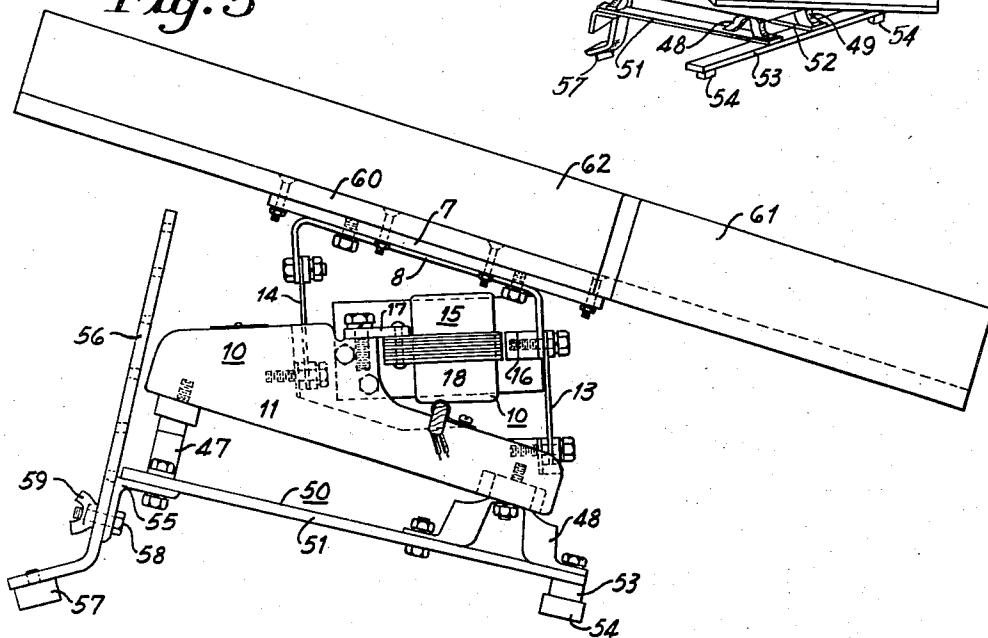
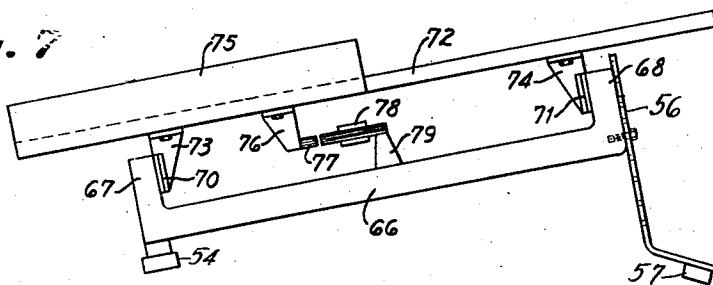


Fig. 7



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Fig. 8

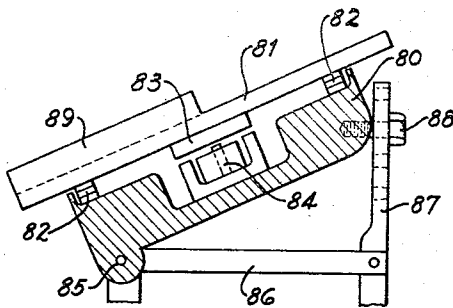
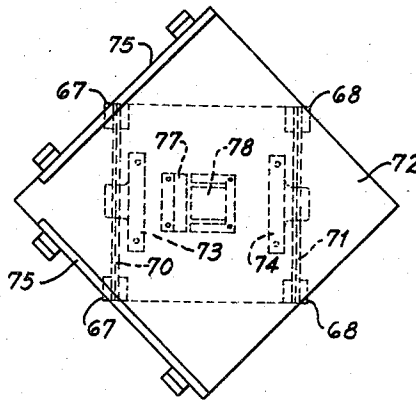


Fig. 9

Fig. 10

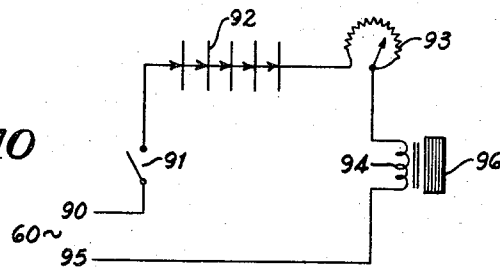
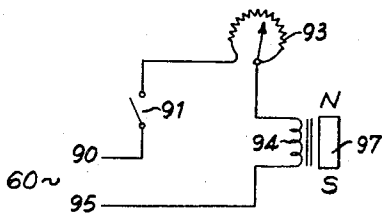


Fig. 11



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PAPER JOGGER

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3 Claims. (Cl. 271-89)

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This invention relates generally to paper joggers having a high speed vibrating table or deck on which uneven stacks of paper can be caused to flow smoothly into even stacks and more particularly to paper joggers which provide a lateral movement and a combined vertical and lateral movement to the stack of paper being jogged into a smooth and even stack.

Paper jogging presents several problems most of which are due to the character of paper being jogged and some owing to the job to be accomplished in conjunction with production in the paper handling art. In preparing small stacks of paper for storage, packaging or trimming, wherein the stacks are manually manipulated with ease and do not form a step in a continuous production program, a deck which vibrates at high speed in a vertical or rectilinear path normal thereto provides adequate service. This type of paper jogger is disclosed in patent applications Serial No. 441,561, filed May 2, 1942, now Patent No. 2,398,777, dated April 23, 1946, and Serial No. 609,416, filed August 7, 1945, which has matured into Patent No. 2,463,448, March 1, 1949. The table or deck is disposed in a horizontal plane and the paper stack is jogged on one edge then turned and jogged on another edge to produce the even stack.

However, if the jogging problem represents a fast step in a continuous production system or requires the simultaneous jogging of a series of stacks of paper that are to be combined or require rapid supply the vertically vibrating deck type paper jogger is unable to fill the requirements.

The principal object of this invention is the provision of a paper jogger wherein the deck is provided with an edge board or fence and is vibrated to produce a form of lateral movement to jog two edges of a stack of paper simultaneously in a lateral direction avoiding the necessity of turning the stack.

However all forms of lateral motion will not function to jog the same kinds of paper lying flat in relatively small stacks. A combined vertical and horizontal movement of a horizontal deck will cause the under sheets of the stack to move in one direction while the upper sheets move in the opposite direction. Thus another object of this invention is the provision of a paper jogger having a deck with corner edge boards and which vibrates only in a path parallel to the deck.

Another object is the provision of a paper jogger having a deck which rapidly vibrates in a fixed path at an angle to the surface of the deck.

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Another object is the provision of a horizontally disposed deck which rapidly vibrates in a fixed path at an angle to the surface of the deck.

Another object is the provision of an edge board for a paper jogger deck.

Another object is the provision of a plurality of guides which work in conjunction with an edge board of a paper jogger deck for jogging a plurality of paper stacks simultaneously.

Another object is the provision of a sloping paper jogger deck which rapidly oscillates in a horizontal path.

Other objects and advantages appear in the following description and claims.

In the accompanying drawings practical embodiments illustrating the principles of this invention are shown wherein:

Fig. 1 is a view in front elevation of a paper jogger with part of the cabinet broken away to show the vibratory motor.

Fig. 2 is a view similar to Fig. 1 of a larger paper jogger the deck of which is provided with a plurality of guides.

Fig. 3 is a side view in side elevation of the paper jogger shown in Fig. 2.

Fig. 4 is a top plan view of the paper jogger shown in Fig. 2.

Fig. 5 is a view in side elevation of a flat sheet paper jogger having a sloping deck with a substantially horizontal movement.

Fig. 6 is a small perspective view of the paper jogger shown in Fig. 5.

Fig. 7 is a view in side elevation of a paper jogger having a sloping deck and capable of only lateral movement parallel with the deck.

Fig. 8 is a top plan view of the structure shown in Fig. 7.

Fig. 9 is a view in side elevation of a tilted paper jogger which vibrates in a rectilinear path normal to the deck.

Fig. 10 is a wiring diagram of the paper joggers employing a rectified alternating current.

Fig. 11 is a wiring diagram of a paper jogger having a polarized armature.

Referring to Fig. 1 of the drawings, 1 represents an enclosed metal cabinet constructed of sheet metal mounted on an angle iron frame 2. The cabinet is a floor model and is provided with four rubber feet 3. The horizontally disposed deck or table top 4 is approximately thirty-six inches from the floor. A table model paper jogger of this character is constructed in the same manner but the cabinet is short to properly locate the height of the working surface or deck. The right end of the deck 4 is provided with an

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edge board or barrier 5 which extends the full width of the deck and is secured thereto. The deck and the edge board are preferably made of hard wood and when the use of the paper jogger is extensive the wood deck and deck board are preferably covered with sheet metal or a fairly heavy coating of soft rubber as indicated at 6. However the deck should be very rigid.

The deck has the heavy metal plate 7 secured to the underside thereof for the purpose of fastening the thick wide strap 8 thereto, the ends of which depend at an angle to the deck. The vibratory motor 10 consists of a massive base casting 11 supported by four coil spring feet 12 on the angle frame 2. The heavy base casting 11 is provided with spaced seats disposed at an angle to the vertical to receive and clamp the fore and aft resilient spring members 13 and 14 which are secured at their other ends to the ends of the strap 8. Thus the entire deck 4 is resiliently supported by the springs 13 and 14 which are wide flat strips.

The electromagnetic motor comprises a field member 15 and an armature member 16. The laminated core of the field member is riveted to the crossbar 17 that is bolted to the base 11. This core is E shaped and the formed coil 18 is mounted on the center stem. The armature 16 is straight and extends the full width of the core of the field member and is secured to the depending end of the strap 8, by the same fastening means that secured the spring 13, in spaced relation to the three poles of the field member. The armature 16 is made up of a laminated structure when rectified alternating current is employed to operate the motor but is a polarized armature when ordinary alternating current is employed.

Since the springs 13 and 14 are parallel and are mounted normal to the movement of the armature and the horizontally disposed deck 4 is supported at an angle relative to the movement of the armature, the vibratory movement of the armature moves the deck downwardly to the left and the springs 13 and 14 return it to the normal position. The armature is attracted to the field 3600 times a minute when the motor is operated from a sixty cycle alternating current but it is not permitted to contact the pole faces. This resultant movement of the deck 4 provides a vertical and a horizontal component and the disposition of the motor is arranged to provide a greater horizontal component than a vertical component. However the magnitude of vibration is relatively small. This motion causes the paper stack that is held on edge, with the laminae normal to the edge board 5, to flow smoothly against the board 5 and bring the edges of the paper into an even and uniform stack. Thus the stack of paper becomes jogged on both edges at the same time.

The field member 18 of the motor 15 is energized from a suitable alternating current source by the lead wires and plug 20. One wire is connected to one side of the knee switch 21 and thence to one end of the rectifier stack 22 made up of copper oxide or selenium washers stacked in one direction. The other end of the rectifier stack is connected to one end of the coil 18 and the other end of the coil is connected to the rheostat 23 the end of which is connected to the other side of the line. Thus the half wave alternating current circuit may be completed by closing the switch 21.

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In the structure shown in Figs. 2, 3 and 4 the steel cabinet 24 is constructed on the angle frame 25 which is provided with a shelf 26 upon which is secured the rubber spring members 27 that resiliently support the massive base 28 of the vibratory motor 30, which is larger than the motor 15 shown in Fig. 1 and provides supports for the deck 31 that are spaced materially greater to enable the deck to carry a heavier load. The aft deck supporting spring 32 is dual as shown in Fig. 2 and their lower ends are secured to the base 28 while their upper ends are secured to the bracket 33 welded to the plate 34 that is secured to the underside of the deck 31 between the spaced rails 35 and 36. The fore deck supporting springs are built into the motor and resiliently support the armature in spaced relation from the pole faces of the field in a manner similar to that shown in Fig. 1. The armature is then secured to the plate 34 by the bracket 37 and vibrates the deck in a path parallel to the disposition of the motor but at an angle to the deck.

The edge board 40 extends the full width of the deck and has a T slot 41 in the top thereof to receive the heads of the bolts 42 which are employed to clamp the plates 43 that carry the paper guide partitions 44. The plates 43 are made integral with the partition 44 and carry the whole of the partition from the edge board, maintaining the bottom edge of the guide partitions spaced from the deck surface. The free end of each guide partition carries the adjustable and rotatable paper guide hook 45 the balls of which may be wider than the paper stacks to be jogged. The hooks 45 are held in sockets by friction and may be turned to press against the outer side of the stack, thus tending to move it toward the adjacent partition. A single partition and ball can hold up the paper stack if it is thin and small enough to pass under the ball while it is being jogged against the deck and the edge board, permitting the operator to prepare a second stack. However a plurality of paper guides mounted on one edge board employ their respective guide hooks to maintain the stacks against the adjacent partition and a series of stacks may be jogged simultaneously and removed and replaced in consecutive order.

The rectifier and the rheostat may be built in the controller unit 46 which is shown suspended in the frame 25 in Fig. 2 and the machine may be started and stopped by the knee switch 21.

The paper jogger shown in Figs. 5 and 6 is provided with the vibratory motor 10 shown in Fig. 1. However in place of mounting the motor within a cabinet it is supported by three rubber spring members 47, 48 and 49 on the frame 50 constructed of the parallel rails 51, 52 attached at the fore end to the long cross rail 53 having the rubber feet 54 adjacent the ends thereof. The aft end of the rails 51, 52 are connected by the angle plate 55 as well as the spring member 47. The third and rear leg 56 has the rubber foot 57 and a series of holes so that it may be attached to the intermediate portion of the angle plate 55 by the bolt 58 and wing nut 59 to adjust the height of the rear end of the motor 10 to tilt the deck 60 at an angle to the horizontal. The deck 60 has the edge boards 61 and 62 which meet at the lower corner 63 and a diagonal line between the corners 63 and 64 of the deck is substantially aligned with the axial center of the motor 10. As previously stated, if the deck 60 is held in a horizontal plane the under sheets in a horizontally disposed stack will creep to the left

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while the top sheets will creep to the right. To overcome this action the deck 60 is tilted until the resultant force is substantially horizontal as shown in Fig. 5 or at a steeper angle as provided for by the height of the rear leg 56. With the resultant force being substantially horizontal or dipping to a greater degree large sheets of paper lying flat on the deck 60 will be jogged into the corner 63 against the edge boards 61, 62.

In Figs. 7 and 8 the base 66 is provided with the two pairs of spaced and upwardly extending lugs 67 and 68. The spaced resilient spring members 70 and 71 are made from flat strips and are secured at their ends to the respective pairs of lugs 67 and 68. The deck 72 is provided with spaced depending brackets 73 and 74 which are secured to the springs 70 and 71 intermediate their ends to resiliently support the deck 72 parallel with the base 66. The corners of the deck 72 are set diagonally relative to the base 66 as shown in Fig. 8 and provided with the edge boards or fences 75. A bracket 76 depends from the underside of the deck 72 to support the armature 77 which is mounted to provide a magnetic coupling between the armature 77 and the electromagnetic field 78 which is supported by the bracket 79 on the base 66. The vibratory motion of the deck 72 is in a single plane parallel with the base 66 which may be held in a tilted position by the leg 56.

In Fig. 9 the paper jogger is similar to that disclosed in the second of the afore-mentioned inventions and comprises the massive base 80 which supports the deck 81 by means of the spaced resilient spring members 82 which are made of rubber. The armature 83 is secured to the underside of the deck and the electromagnet 84 is mounted on the base to provide a magnetic coupling with the armature to vibrate the deck in a rectilinear path normal to the surface of the deck. The base 80 is hinged at 85 to one end of the frame 86 while the other end of the base is adjustably secured to the vertical member 87 of the frame by the bolt 88. The deck 81 is disposed relative to the base 80 in the same manner as that of the deck 72 in the structure of Fig. 8 and the edge boards 89 on the deck 81 produce the jogging surface for the stack of paper with the fenced corner at the lowermost edge.

The structures of Figs. 5 to 9 each provide a lateral movement to the paper stack, the laminations of which are parallel with the deck.

In each of the paper joggers illustrated the spring members whether they are constructed of steel straps or a rubber-like material are turned to provide a natural vibration of the deck which they support, which vibration must be within a range from 15% below to 10% above the frequency of the alternating current employed to energize the electromagnetic motor but this natural period must not be synchronized with this alternating current frequency.

As previously stated, if the armature of these

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electromagnetic motors are made up of laminated iron it is preferable to employ a half wave rectified current to energize the motor coil, as shown in the wiring diagram in Fig. 10 wherein the line current may be any desired frequency such as sixty cycles and the coils of the motors are suitably wound for the voltage selected. Current of one-half wave of each cycle flows from the line 93 through the switch 91 when closed and thence through the rectifier such as the copper oxide stack shown at 92 and the variable resistor 93 to one side of the electromagnetic coil 94 and return to the other side of the line 95 to provide intermittent pulsating current. The armature 96 is illustrated as being laminated.

In Fig. 11 the rectifier is omitted as the armature 97 is polarized, being made of suitable material such as a permanent magnet made of "Alnico" or other suitable known alloy of high magnetic retentivity. In each instance any variation of the resistor 93 produces a variation in voltage and thus varies the amplitude of vibration of the electromagnetic motor.

I claim:

1. In a paper jogger the combination of a base, a rigid deck to support a stack of paper, fence means secured to the deck and having a paper stack engaging surface at right angles to the deck defining a corner, multiple spring means connected between the base and the deck to support the deck and said fence means for vibration in a manner such that the corner vibrates in a plane parallel to a plane angular to and intersecting the paper engaging surfaces of the deck and fence means, a vibratory motor having an armature member and an electromagnetic field member, and means to secure one of said motor members relative to the deck and the other relative to the base and provide magnetic coupling therebetween to vibrate the deck and jog both sides of the paper stack simultaneously.
2. The structure of claim 1 which also includes base supporting means to support the paper engaging surface of the deck in a horizontal plane.
3. The structure of claim 1 which also includes base supporting means to support the paper engaging surface of the deck in a plane at an angle to the horizontal.

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