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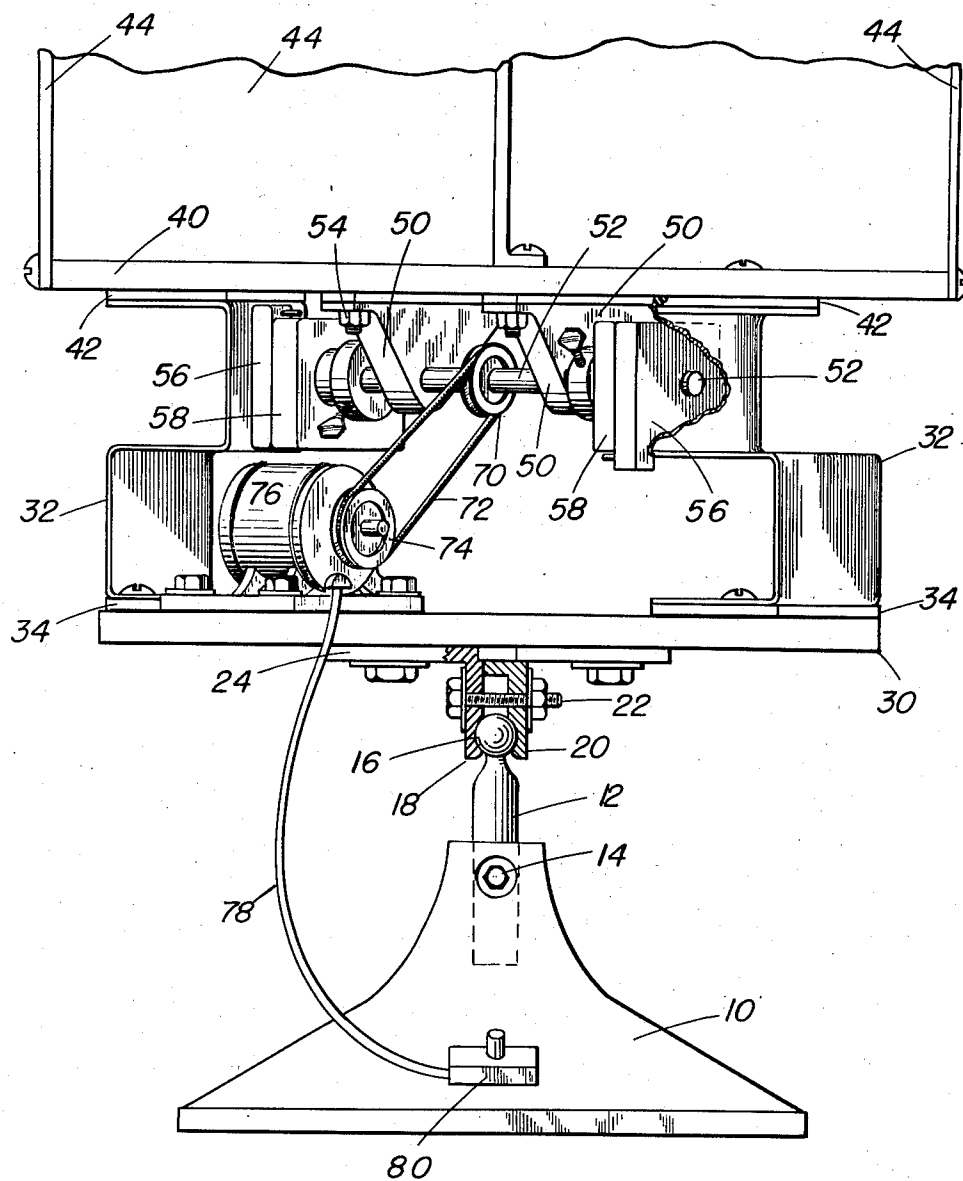
I. SCHEINKER
JOGGING MACHINE

2,573,164

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2 SHEETS—SHEET 1

Fig. 1



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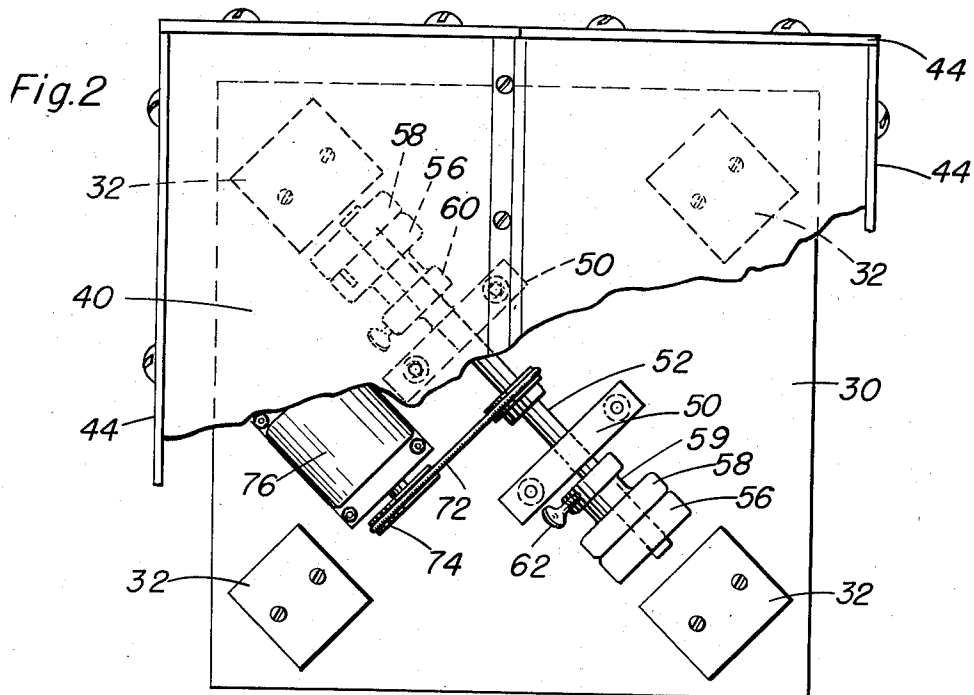
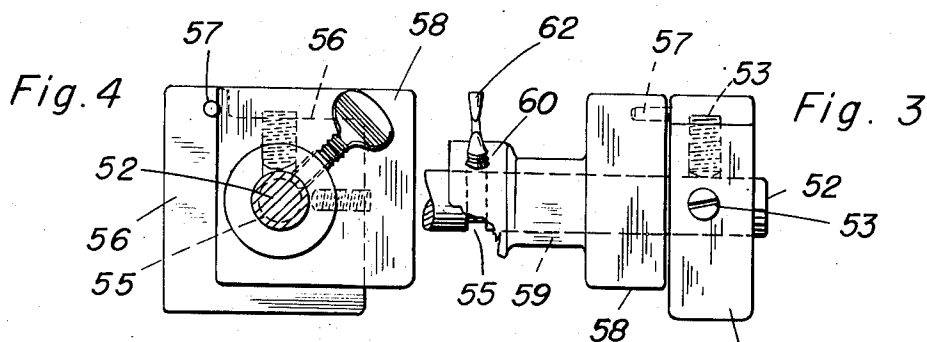
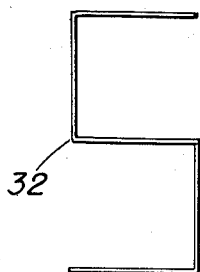
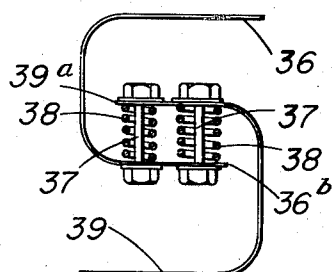
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2 SHEETS—SHEET 2



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2,573,164

JOGGING MACHINE

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11 Claims. (Cl. 271-89)

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This invention relates to jogging machines useful for the mechanical aligning, straightening and stacking of sheets of paper and the like, wherein the motion of the machine in connection with the parts of the table on which the sheets are placed causes the sheets to automatically stack themselves in a neat pile.

It is an object of my invention to provide an improved and simplified jogging machine structure which may be economically manufactured from comparatively inexpensive parts, but which will be of sturdy construction and will be reliable and efficient in operation over long periods and will require little attention and adjustment.

Another object of the invention is to provide a jogging machine which has provision for vibrating the table in all directions, that is to say, there are horizontal components, forward and backward as well as sideways, and at the same time, vertical components all of which combine for multidirectional complex motion which is variable in intensity and non-periodic.

Another object of the invention is to provide a jogging machine of the foregoing type which may be tilted at any desired angle in any direction.

Another object of the invention is to provide a jogging machine of the above type which is manually adjustable at will without the use of tools, for the purpose of varying the degree or magnitude of the complex motion of its table or portions thereof.

Another object of the invention is to provide for efficient handling of various weights of papers.

Another object is to enable a machine of the foregoing type to handle simultaneously more than one weight and size of paper, by providing for different degrees or amplitudes of motion over different portions of the machine table.

Other objects and advantages of the invention will become apparent as it is described in the accompanying drawings.

In the drawings—

Fig. 1 is a front elevational view of a jogging machine embodying the invention.

Fig. 2 is a top plan view partly broken away of the machine illustrated in Fig. 1.

Fig. 3 is a detailed elevational view of one end of the main shaft showing the arrangement thereon of adjustable weights.

Fig. 4 is an end view of the structure illustrated in Fig. 3.

Fig. 5 is a detailed elevational view of the resilient supports between the table and platform of the machine as illustrated in Fig. 1 and

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Fig. 6 shows an alternate form of resilient support.

Referring to the drawings the machine is supported upon a massive base or pedestal 10 from the center of which a cylindrical post 12 extends upwardly. Its degree of extension or elevation may be adjusted by means of a set screw or bolt 14. The post 12 has a spherical top portion 16 which is clamped between fixed and movable jaw members 18 and 20 by means of a bolt 22 passing through said jaw members. The fixed jaw 18 may be a downwardly extending arm from a casting 24 on the upper surface of which is bolted, or otherwise suitably secured rigidly, a platform 30. The movable jaw member 20 may be in the form of an angle member; and both it and the fixed jaw are provided with complementary concave recesses for the reception of the ball or spherical portion 16 on the post 12. The parts just described comprise a substantial supporting structure for the remaining parts of the machine. By tightening the bolt 22 to give the proper degree of frictional holding force in the ball and socket joint, the supporting structure can be tilted to any desired angle and in any direction, at will, and without the necessity for other adjustment.

The platform 30 preferably is made in rectangular shape but may be made in any other convenient shape within the scope of the invention. At the four corners of the platform in diagonally opposite positions are oppositely facing resilient supporting members 32. Preferably these are made from resilient metal or other resilient material into substantially S-shape as indicated in detail in Fig. 5. The placing of the supporting members 32 in diagonal positions in manner shown causes the members in adjacent corners to be non-parallel and thereby provides lateral support in different directions for the table, yet permits the resilience of mounting needed to accomplish the objectives of the invention as will be better understood as the description of the invention proceeds. With the foregoing in mind, the supporting members 32 may be any suitable form providing non-rigid support of the table from the platform. The bottom plates or surfaces of these supporting members are bolted or otherwise suitably secured to the platform 30, with a slab of sponge rubber 34 or other cushioning means between. Although four supports are illustrated, a greater or less number could be used as well.

On top of the upper surfaces or plates of the resilient supporting members 32 is supported a table 40 made of plywood or other stiff but resil-

ient material into rectangular shape, although it may be of any other suitable shape within the scope of this invention. A slab of sponge rubber 42 or other cushioning means is preferably inserted between the top plate and the bottom surface of the table 40 and those parts are then bolted or otherwise suitably secured together. By the means just described, the table 40 is mounted above the platform 30 in substantially parallel relation to, and in such fashion that the table 40 may have a considerable amount of the complex motion imparted to it, with practically none being transmitted to the base or support of the machine.

In Fig. 6 an alternative form of resilient support is illustrated which may be used as a substitute of the form illustrated in Fig. 5. In the form of Fig. 6 substantially U-shaped sheet metal members 36, 39 are joined by connecting bolts 37 with coiled springs 38 located around the shanks of the bolts between the under surface of the upper arm 39a of the lower member and upper surface of the lower arm 36b of the upper member. When this type of resilient support is employed, there is little or no need for other cushioning means between the support and the platform 40 and table 30. Various other types of resilient supports are possible for the purpose of avoiding transfer of the motion of the table to the platform.

The means for imparting the complex motion to the table 40 will now be described. Secured to the bottom surface of the table 40 are a pair of parallel bearing members 50 in which is rotatably supported a shaft 52 preferably lying parallel to a diagonal of the table 40. The bearing members may be secured to the table by bolts 54 or any suitable means. Adjacent each end of the shaft 52 are a pair of eccentrically mounted weights or members 56, 58. In order that as the shaft rotates these weights shall create a condition that will cause the jogging action of the table, it is necessary that the center of gravity of said weights be eccentric to the shaft axis; and the distance of the center of gravity relative to the shaft axis must be adjustable in order to vary the amplitude of motion.

In the embodiment of the invention as illustrated herein, the pairs of weights at each end of the shaft are identical, and therefore they will be described together. They may be of substantially square section with an eccentrically located bore for the reception of the shaft 52, but obviously the weights may take other form. The weight 56 preferably is secured in semi-permanent relation upon the shaft 52 by set screws or bolts 53. It is desirable however, that the weight 58 be mounted by a more readily adjustable means and for this purpose the weight 58 has a neck 59, extending in a direction opposite the weight 56, and a large collar 60 which is radially bored and screw-threaded to receive a manually operable thumb screw or bolt 62 whose inner end projects into a circumferential groove 55 cut into the shaft 52. Thus by loosening the thumb screw 62 the rotary position of the weight 58 (both on the shaft 52 and relative to the weight 56) may be readily varied, and the weight 58 may thereby be secured in any desired position of angular adjustment. With this structure and kind of adjustment it is possible to change the distance of the center of gravity from the axis of rotation and also to vary the relation of one weight to the other. When the weights are in the position shown in Fig. 4 they will most nearly approach counterbal-

ancing condition, the one to the other; but that condition will never be exactly reached, it being necessary at all times to have at least a minimum of unbalance and accompanying complex motion to have the machine perform its function of aligning and straightening sheets of paper within a stack. To provide for readily determining the position of minimum motion a pin 57 may be fitted into the side wall of weight 56 in position to engage side edge of weight 58 (see Fig. 4). From that point the weight 58 may be angularly adjusted to increase the amount of such motion. Thus, on rotation of shaft and depending on the angular adjustment of the eccentrics in relationship to each other on the shaft, centrifugal forces are set up which produce an irregular wobble in the shaft and its bearings which is applied through its bearings to the table top, setting the table top in motion limited by the resiliency of the S-shaped spring supports 32. As the spring supports are compressed, they react to reverse this motion, and as the period of this reaction is quite different from that of its originating force, the rebound acts contra to the next periodic set of centrifugal impulses from the eccentrics, further complicating the direction, distance, and amplitude or acceleration of the motion of the table top.

In order to rotate the shaft 52, a pulley 70 is provided, preferably at the center of the shaft, and it is connected by a belt 72 with a second pulley 74 on the shaft of a conventional electric motor 76 which is bolted upon the upper surface of the platform 30. The feed wire 78 may connect the motor with an electric switch 80 conveniently located on the base or pedestal 10 and connected in any suitable fashion with the source of electric current.

From the foregoing it may now be understood that as the motor rotates, rotation of the shaft 52 is caused. The rotation of the shaft 52 with the weights located in any desired relation or position of adjustment will cause complex motion of the table 40 which is non-periodic and of variable intensity and of magnitude depending upon the position of adjustment of the weights and also speed of rotation.

While in a broad and general sense the motion of the table may be described as vibratory, the motion, more explicitly, may be described as follows:

The motion of any point in the table may be in all directions. Thus, a tendency of weight 56 to cause pure vibration in the narrow periodic sense of the word is complicated by the weight 58 which, acting at crosspurposes to weight 56, adds a separate independently acting force which may tend to move the table sideways or otherwise while the weight 56 is tending to move the table up or down. As a result, the actual motion of the table top, due to the S-shaped supports 32 and the opposed, adjustable eccentrics is a motion which is eccentric both in direction and rate. A point on the table top might at irregular intervals be at almost every possible point within a space defined by the amplitude of movement from its starting point.

Furthermore, adjustment of the weights at one end of the shaft differently than those at the other end will result in one side of the table having a different amount of degree of motion than the other, but both motions will be multi-directional. Thus, it is possible to handle simultaneously different weights of papers which may require different amounts of motion. Or, if the

table is divided into more than two parts, more than two types of papers may be handled together.

The ball and socket joint (16, 18, 20) which enables the platform and table to be tilted at any desired angle and also in any direction at will, and which allows such tilting by merely overcoming the friction of the joint with manual effort (without the need of loosening and retightening) is able to be used because of the nature and characteristics of operation of the machine. That is to say, the minimizing or in a practical sense, substantially eliminating transmission to the platform the complex motions of the table, enables the frictional ball and socket type of joint to be used when tightening to provide no more friction than can be overcome manually in tilting the table. This combination of desirable characteristics and functions is a definite improvement over prior machines.

When thin sheets of tissue or carbon papers are to be aligned, it is desirable on some occasions to maintain a film of air between the sheets until their edges are in register. To this end and to meet such conditions, I provide solid side walls 44 around the table 40 so as to tend to retard the escape of air from between the successive sheets in the pile or stack.

When heavier sheets are to be stacked, the aligning is facilitated by providing a series of spaced posts around the edge of the table 40.

From the foregoing it will be apparent that I have provided a structure which may be constructed with comparatively inexpensive parts and requiring a minimum outlay of capital and of labor and material. Yet the resulting machine is very sturdy, has been found very reliable in use, requires a minimum of attention and servicing over considerable periods, and embodies many improvements over prior machines.

Many modifications within the scope of my invention will occur to those skilled in the art and therefore I do not limit my invention to the specific embodiments described and illustrated.

What I claim is:

1. A jogging machine comprising a table for receiving the sheets to be stacked, means along the edges thereof to align the sheets, bearings beneath said table, a shaft supported in said bearing, weights eccentrically mounted on each end of said shaft one of said weights at each end being adjustable rotatively to substantially counterbalance the other weight at its end or to act at any desired degree of unbalance, a platform below said table, resilient sheet metal supporting members bent into S-shape supporting said table above said platform, said supporting members being diagonally opposite and facing oppositely at the four quarters of said platform, a motor on said platform connected to drive said shaft, a support for said machine and a universal joint connecting between said support and platform adjustably to allow tilting of said platform at any desired angle.

2. A jogging machine comprising an inclined table, means supported by and beneath said table for imparting multi-directional motion to said table, a platform, resilient means formed of sheet metal supporting said table above said platform in normal at rest position wherein the resilient means is in equilibrium from which position such resilient means permits movement of the table away from and toward the platform and laterally certain of said resilient sheet metal means being positioned on said platform in non-parallel positions to provide lateral support in different di-

rections cooperating with and reacting to said motion-imparting means to produce complex, non-periodic, multi-directional motion of said table, and a motor mounted on said platform and connected for driving said motion-imparting means.

3. A jogging machine comprising an inclined table, means supported by and beneath said table for imparting multi-directional motion to said table, a platform, S-shaped sheet metal spring members supporting said table above said platform in normal at rest position where in the resilient means is in equilibrium from which position such resilient means permits movement of the table away from and toward the platform and laterally certain of said S members being positioned on said platform in non-parallel positions to provide lateral support in different directions cooperating with and reacting to said motion-imparting means to produce complex, non-periodic, multi-directional motion of said table, and a motor mounted on said platform and connected for driving said motion-imparting means.

4. A jogging machine comprising an inclined table, means supported by and beneath said table for imparting multi-directional motion to said table, a platform, resilient means supporting said table above said platform in normal at rest position wherein the resilient means is in equilibrium from which position such resilient means permits movement of the table away from and toward the platform and laterally certain of said resilient sheet metal means being positioned on said platform in non-parallel positions to provide lateral support in different directions cooperating with and reacting to said motion-imparting means to produce complex, non-periodic, multi-directional motion of said table, and a motor mounted on said platform and connected for driving said motion-imparting means, and means for manually adjusting said motion-imparting means to vary the amount of motion imparted to the table.

5. A jogging machine comprising an inclined table, a rotary shaft supported by and beneath said table, a plurality of members mounted on said shaft creating a condition of unbalance and imparting multi-directional motion to said table, means to adjust the relative angular positions of said members for varying the amount of said motion, a platform, resilient means supporting said table above said platform, said resilient means cooperating with and reacting to said motion-imparting means to produce complex, non-periodic, multi-directional motion of said table, and a motor mounted on said platform and connected for driving said motion-imparting means.

6. A jogging machine comprising an inclined table, a rotary shaft supported by and beneath said table, a plurality of members mounted adjacent each end of said shaft creating a condition of unbalance and imparting multi-directional motion to said table, means to adjust the relative angular positions of said members for varying the amount of said motion, a platform, resilient means supporting said table above said platform, said resilient means cooperating with and reacting to said motion-imparting means to produce complex, non-periodic, multi-directional motion of said table, and a motor mounted on said platform and connected for driving said motion-imparting means.

7. A jogging machine comprising an inclined table, a rotary shaft supported by and beneath said table, a plurality of members mounted on said shaft creating a condition of unbalance and

imparting multi-directional motion to said table, means to adjust the relative angular positions of said members for varying the amount of said motion, a platform, S-shaped sheet metal spring members supporting said table above said platform, said S-members cooperating with and reacting to said motion-imparting means to produce complex, non-periodic, multi-directional motion of said table, and a motor mounted on said platform and connected for driving said motion-imparting means.

8. A jogging machine comprising an inclined table, a rotary shaft supported by and beneath said table, a plurality of members mounted adjacent each end of said shaft creating a condition of unbalance and imparting multi-directional motion to said table, means to adjust the relative angular positions of said members for varying the amount of said motion, a platform, S-shaped sheet metal spring members supporting said table above said platform, said S-members cooperating with and reacting to said motion-imparting means to produce complex, non-periodic, multi-directional motion of said table, and a motor mounted on said platform and connected for driving said motion-imparting means.

9. A jogging machine comprising an inclined table for receiving sheets to be stacked, said table being of stiff resilient material and capable of having different magnitudes of motion simultaneously over different parts thereof, means extending above the top surface of said table to align the sheets, bearings beneath said table, a shaft supported in said bearings, weights eccentrically mounted on each end of said shaft one of said weights at each end being adjustable rotatively to act at any desired degree of unbalance with respect to the weights at the opposite end of said shaft whereby to impart different degrees of motion to different parts of said table, a platform below said table, resilient sheet metal supporting members bent into S-shape supporting said table above said platform, said supporting members being diagonally opposite and facing oppositely at

the four quarters of said platform, a motor on said platform connected to drive said shaft.

10. A jogging machine as claimed in claim 9 wherein the table is made of plywood, and the aligning means comprising straight closed sides extending from the upper surface of the table to retard the escape of air at the edges of the sheets and to assist in maintaining an air cushion between the sheets.

11. A jogging machine comprising an inclined table for receiving sheets to be stacked, said table being of stiff resilient material, bearings beneath said table, a shaft supported in said bearings, weights eccentrically mounted on each end of said shaft one of said weights at each end being adjustable rotatively to substantially counterbalance the other weight at its end or to act at any desired degree of unbalance, a platform below said table, resilient sheet metal supporting members bent into S-shape supporting said table above said platform, said supporting members being diagonally opposite and facing oppositely at the four quarters of said platform, a motor on said platform connected to drive said shaft, and straight closed sides extending from the upper surface of the table to retard the escape of air at the edges of the sheets and to assist in maintaining an air cushion between the sheets.

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