MEANS FOR ASSEMBLING A PLURALITY OF FLAT ARTICLES

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1. Generically, the present invention relates to a machine for assembling or matching a plurality of flat articles of similar internal contour into stacked or face to face relationship, and specifically, has reference to assembling a plurality of key blanks having either a male or female keyway in the internal diameter thereof in such a manner that the blanks will be in perfect alignment. It will, of course, be appreciated that it has been rather difficult to assemble articles of the above mentioned nature, and it has generally been necessary to match the blanks by manual processes which are tedious, time-consuming and expensive. Devices have been provided for assembling disk-like members by mechanical means, but in the case of my knowledge, no set machine has been developed for arranging key blanks having a keyway on the inside diameter in proper alignment.

Accordingly, an important object of my invention is to provide a machine wherein a plurality of key blanks are disposed around a rotating spindle which cooperates with a support therefor, in such a manner that the spindle will pick up the keyway of the respective blanks whereby the blanks will be correctly and perfectly aligned.

Another object of my invention is to provide a machine for aligning a plurality of blanks wherein the machine includes a plurality of aligning members which are operated in unison, thereby permitting a plurality of blanks having different types of internal contours to be matched during a single operation.

Yet a further object of my invention is to provide a machine for matching or aligning key blanks of the type having a keyway in the internal diameter of the blanks which is comparatively simple in structural detail, positive and efficient in operation, and capable of being inexpensively manufactured.

And another object of my invention is to provide a machine of the character described wherein the supporting member for the rotatable spindle is so formed as to center the keyway of the blank upon the rotating spindle.

Broadly, the invention comprises a standard in which a spindle is rotatably mounted, the spindle being provided with a support, so constructed that the keyway of each of the blanks carried by the spindle and support will be centered so that the rotatable spindle can pick up the keyway of the respective blanks, thereby providing for the perfect alignment or matching of the blanks disposed around the spindle and support. A suitable drive connection is provided between the rotating spindle and a source of power for imparting rotary movement to the spindle.

In order to increase the capacity of the machine, a plurality of spindles and supports may be carried by the standard and in this situation all of the spindles are coupled by a suitable drive connection between the spindles and the source of power so that simultaneous movement may be imparted to the spindles. By thus providing a plurality of spindles it is possible to match or align a series of blanks having different internal contours.

With the foregoing and other objects in view, the invention consists in the details of construction and in the arrangement and combination of parts to be hereinafter more fully set forth and claimed.

In describing the invention in detail, reference will be had to the accompanying drawings forming part of this application, wherein like characters denote corresponding parts in the several views, and in which:

Figure 1 is a plan view of the machine constructed in accordance with my invention.

Figure 2 is a front elevational view of the machine shown in Figure 1.

Figure 3 is a rear elevational view of the machine, but being on a slightly smaller scale than Figures 1 and 2.

Figure 4 is a sectional view taken along the line 4—4 of Figure 1, looking in the direction of the arrows and being on a slightly enlarged scale.

Figure 5 is a side elevation, partly broken away, of the support for the rotatable spindle.

Figure 6 is an end view of the support shown in Figure 5.

Referring to Figures 1 and 2, I have shown a base or supporting member 10, preferably of rectangular outline, having a vertical plate 11 secured thereto adjacent one end thereof by welding or the like. A motor 12 for driving the machine is bolted to the base 10, as at 13.

A plurality of bearing housings 14 are attached to the plate 11 at equally spaced intervals adjacent to the upper end of the plate by cap screws 15. A ball bearing assembly 16 is disposed within each housing 14 and a pressure fitting 17 is carried by each housing for supplying a lubricant to the bearing 16. While I have shown four such bearing housings, it is to be understood that a more or less number may be employed and in view of the fact that each housing and its associated parts are identical in structure and operation, the description will be limited to but a single unit.

A spindle 18 is provided with a longitudinal bore 19 extending therethrough and is pressed into the bearing 16 at its inner end and formed with an enlarged head 20 at its outer end. A drive
pulley 21 is carried by the spindle 18 adjacent the head 20 and is connected with a pulley 22 on the drive shaft of the motor 12 by means of a belt 23. A second pulley 24 is secured to the spindle 18 by a set screw 25 in such a manner that the flat face of the pulley 24 engages the plane face of the pulley 21. A spacer 26 is disposed between the pulley 24 and the bearing 16 and secured thereto by a set screw. 27. It is thought apparent that the spindle 18 employed in connection with the remaining bearing housing will be of lesser length than the spindle above described and, as shown in Figure 1, the pulleys 24 on the spindles are all in alinement.

A circular rod 28 is adapted to extend through the bore 19 of each spindle and is secured to the spindle by means of a screw 29 tapped into an opening formed in the head 20. As clearly illustrated in Figures 1 and 4, the circular rods 28 are of such a length as to extend a substantial distance beyond the outer face of the vertical plate 11. The free end of the rod, that is to say that end extending beyond the outer face of the plate 14 has a support 30 associated therewith. The support 30 is suitably secured at its inner end to the plate 11, as indicated at 31, and is formed with a recess 32 in its upper area in which the rod 28 is seated. The outer end of the support 30 is cut away to form a shelf 33 having an arcuate upper surface 34. With reference to Figure 4, it can be seen that a bearing 35 for the outer end of the rod 28 is carried by the shelf 33 so that the rod will be maintained in the recess 32.

As perhaps best illustrated in Figure 6, the sides of the support 30 are beveled or inclined, as indicated at 36, and as will later be more fully described, the purpose of these sides is to carry the keyway of the disk so that the disk will be stopped in the proper position.

A plurality of idler pulleys 37 are located intermediate the pulleys 24 and each of the idler pulleys is carried by a stud 38 secured to the plate 11, as shown at 39. A spacer 40 is located between the pulley hub and the securing means 39. One of the pulleys 37, preferably the pulley most distantly removed from the drive pulley 21, is secured, as shown at 41, to one end of a link 42. The opposite end of the link 42 is bolted to the frame 43 as shown at 44 and hence it can be seen that this pulley will function as a tighter for endless belt 44 which extends around the pulleys 24 and idler pulleys 37, in the manner shown in Figure 3.

While it is believed that the operation of the machine is readily apparent to those skilled in the art, it may be briefly summarized as follows. A plurality of lamination key blanks, two different types of which are indicated A and B in Figure 2, are disposed over the rod 28 and the support 30. The motor 12 is then actuated and hence rotary movement will be imparted to each of the rods 28. Since the diameter of the rod 28 is less than the width of the keyway in the blank and by virtue of the inclined sides 36, the keyway will be centered on the rod 28 thereby assuring a perfect alinement of the blanks, since the rod will pick up the keyway of each blank.

It will be appreciated from the above that I have provided a machine for accomplishing the desired end which is not complex in either structural detail or operation and wherein the rotating rods 28 may be easily and quickly removed from the spindle 18 by the manipulation of the screw 29. By virtue of the pulley and belt drive associated with the various spindles it is possible to match a great number of blanks simultaneously and also match blanks of different internal contour during the single operation.

I claim:

1. A machine for arranging a plurality of flat blanks having a keyway in the internal diameter thereof in perfect alinement comprising a base member, a spindle mounted in the base member for rotary movement relative thereto, means to impart rotary movement to the spindle, a support carried by the base provided with a keyway in which the spindle is seated, and inclined surfaces on the support merging with the recess whereby the keyway of the blank will be guided to the spindle during rotation thereof for stopping each blank in alinement with the other blanks.

2. A machine of the type as claimed in claim 1 wherein a bearing for the free end of the spindle is carried by said support.

3. A machine for arranging a plurality of flat blanks having a keyway in the internal diameter thereof in perfect alinement comprising a base, a vertically disposed plate secured to said base, a support attached to said plate and provided with a longitudinally extending groove in the upper end thereof, a spindle extending through said plate and being seated in said groove, a bearing carried by said plate, means to rotationally mount said spindle in the bearing, a source of power, a drive connection between the spindle and the source of power, and inclined surfaces on the support merging with the longitudinally extending groove for guiding the keyway of the blank to the spindle whereby each blank will be stopped in alinement with the other blanks when rotary movement is imparted to the spindle.

4. A machine for arranging a plurality of flat blanks having a keyway in the internal diameter thereof in perfect alinement comprising a base, a vertically disposed plate secured to said base, a plurality of spindles associated with said plate, each support having a longitudinally extending groove in the upper end thereof, a plurality of spindles extending through said plate, each spindle being seated in the groove of each support, a plurality of bearings carried by the plate, means to rotationally mount said spindles in each of said bearings, a source of power, a drive connection between one of said spindles and the source of power, a second drive-connection between said last-named spindle and the remaining spindles whereby said spindles are rotated simultaneously, and guiding surfaces on each of said supports merging with the longitudinally extending groove for guiding the keyway of the blank to the spindle whereby each blank will be stopped in alinement with the other blanks when rotary movement is imparted to the spindle.

5. A machine as claimed in claim 4 wherein said supports extend horizontally from the plate.

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