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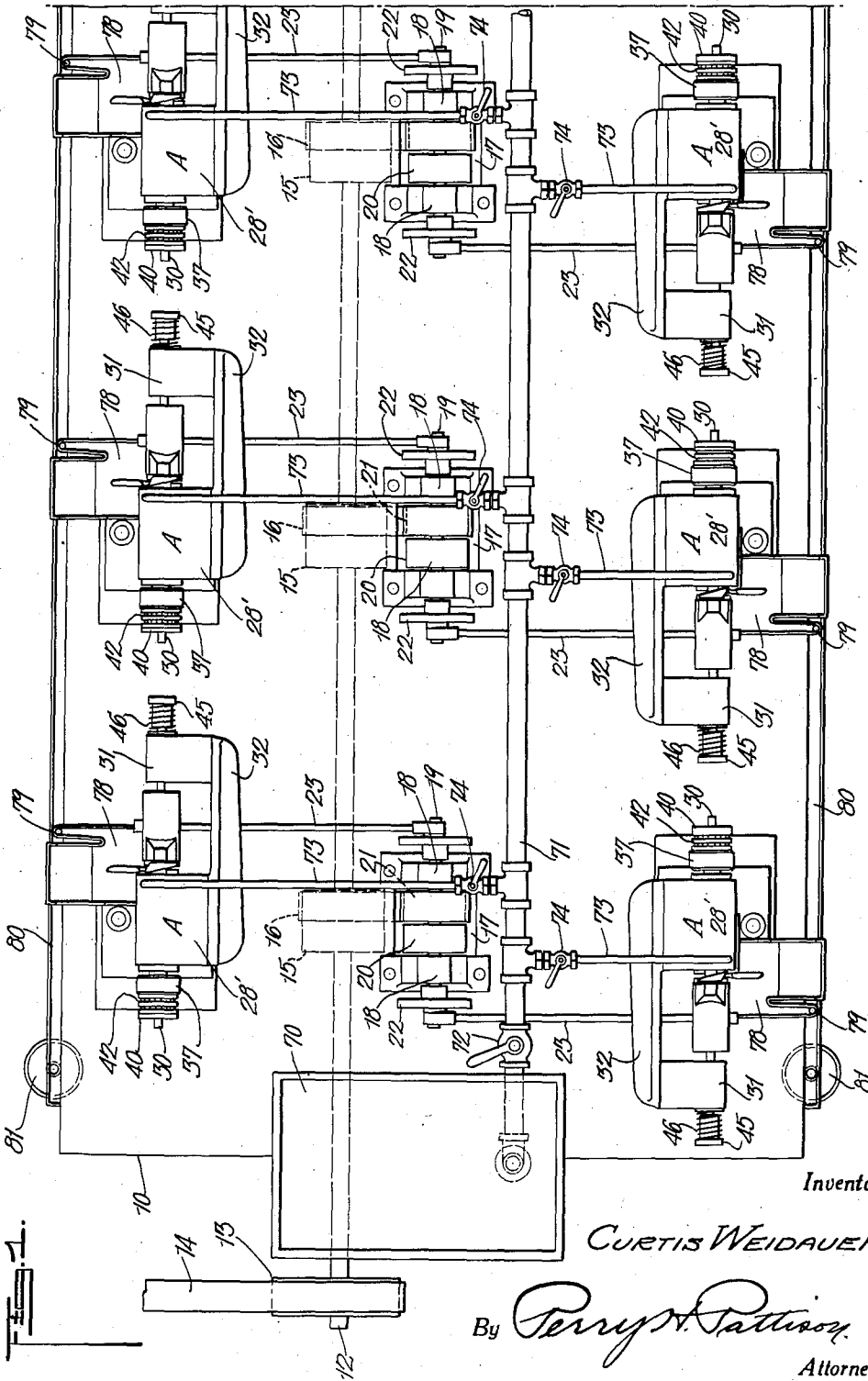
C. WEIDAUER

1,981,935

LAPPING MACHINE

Filed March 18, 1932

3 Sheets-Sheet 1



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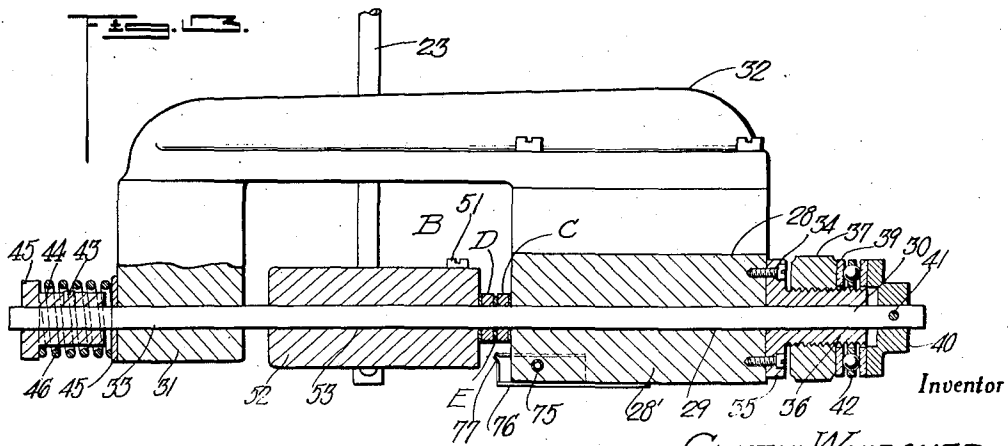
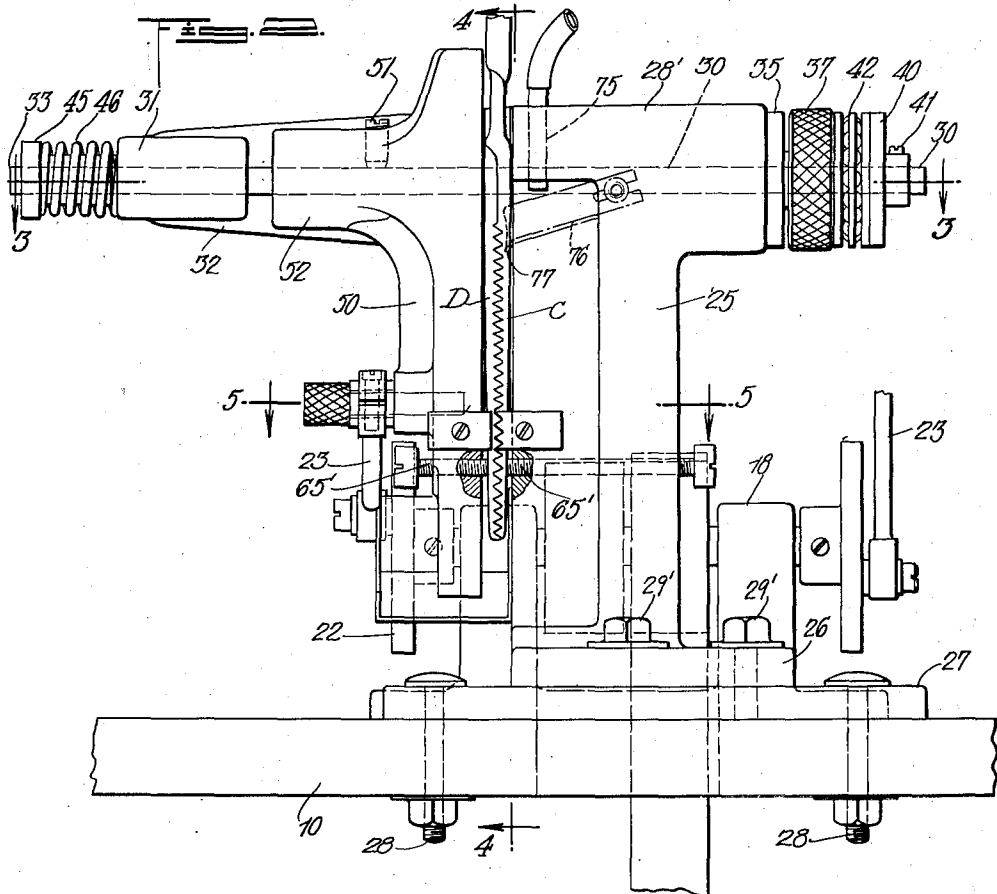
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3 Sheets-Sheet 2



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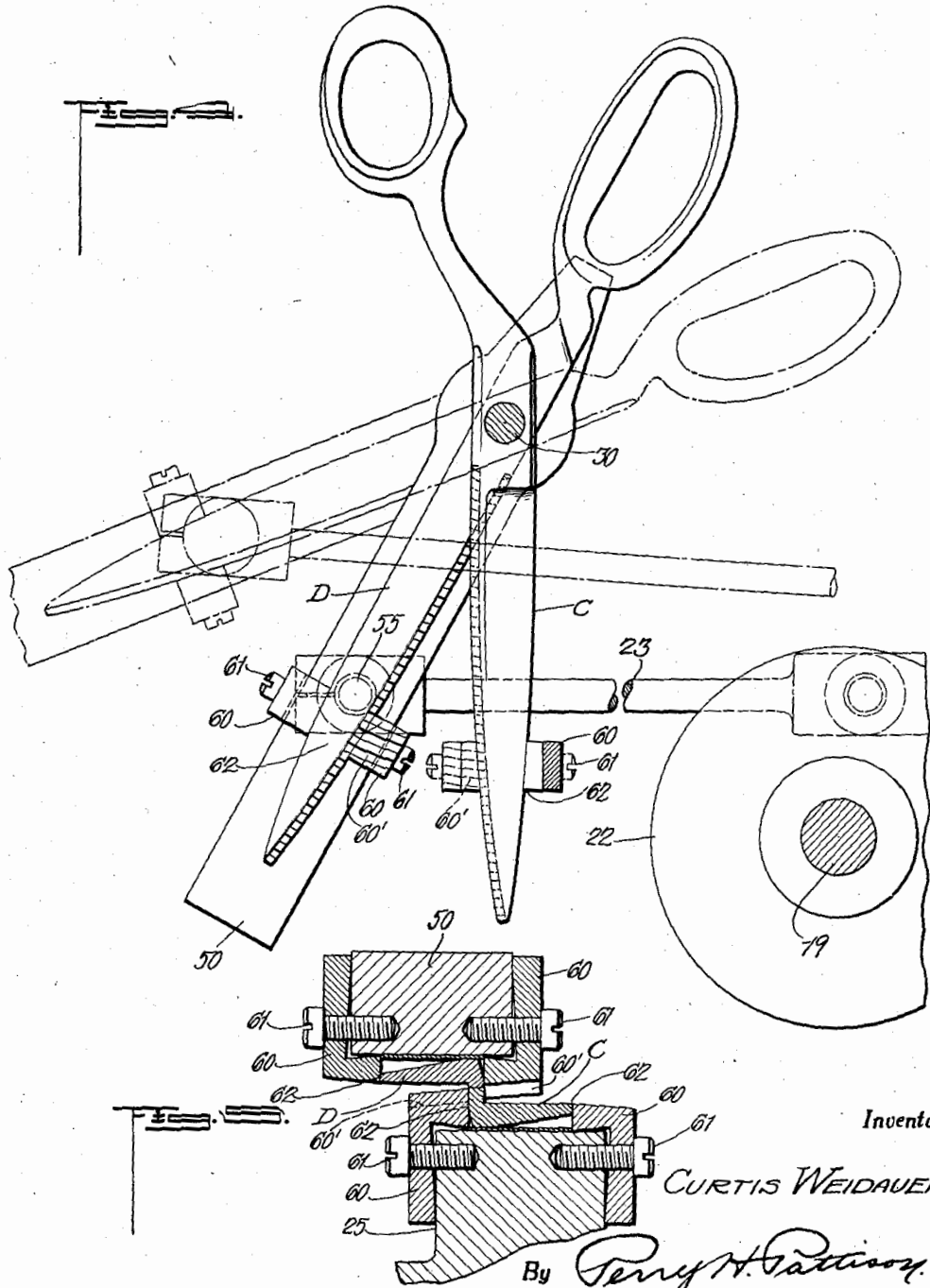
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3 Sheets-Sheet 3



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UNITED STATES PATENT OFFICE

1,981,935

LAPPING MACHINE

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Application March 18, 1932, Serial No. 599,616

7 Claims. (Cl. 51—26)

The present invention relates to new and useful improvements in lapping machines, and more particularly it pertains to machines for lapping the cutting or shearing edges of pinking shears or scissors of the type disclosed in my pending application filed, September 19, 1931, Serial Number 563,829.

One object of the present invention is to improve the construction and mode of operation of lapping machines and so to construct such machines that they may be simultaneously operated in multiple.

A feature of the invention resides in a novel construction whereby the articles being operated upon may be firmly held in position during the lapping operation, and yet they may be placed in and removed from the machine with facility.

A further feature of the invention resides in the provision of novel mechanism for simultaneously operating a plurality of such lapping machines and at the same time permit of individual operation thereof as regards the placement and removal of articles being operated upon thereby.

Still a further feature of the invention resides in a novel system for the supply of an abrasive material to the articles being operated upon and the provision of novel means for the control thereof.

Still a further feature of the invention resides in a novel construction whereby the extent to which the lapping operation is being carried out, may from time to time be tested, and the articles operated upon adjusted to increase or decrease at will the extent or degree of lapping.

Other features of the invention relate to certain novel and improved constructions, arrangements and combinations of parts hereinafter described and particularly pointed out in the claims, the advantages of which will be readily understood and appreciated by those skilled in the art.

The invention will be clearly understood from the accompanying drawings illustrating the invention in its preferred form and the following detailed description of the constructions therein shown.

In the drawings;

Figure 1 is a top plan view of a lapping machine constructed in accordance with the present invention,

Figure 2 is a view in front elevation, partly in section of one of a plurality of lapping units,

Figure 3 is a horizontal sectional view taken on the line 3—3 of Figure 2,

Figure 4 is a vertical sectional view taken on the line 4—4 of Figure 2, and;

Figure 5 is a detail sectional view taken on the line 5—5 of Figure 2.

Referring specifically to the drawings and particularly to Figure 1, the reference character 10 designates a suitable support preferably in the form of a bench or table. A plurality of lapping units A are employed and as illustrated in said figure, these lapping units are arranged in spaced relation in groups there being a group extending longitudinally of each side edge of the support and preferably close to the side edge thereof.

The several lapping units are driven from a single source of power which in the present embodiment of the invention consists of a shaft 12 extending longitudinally of the support. This shaft carries a driving pulley 13 around which passes a driving belt 14 operated by a suitable motor not herein illustrated. Mounted at intervals on the shaft 12, there are pulleys 15. Passing around the pulleys 15, there are driving belts 16 which pass upwardly through openings 17 in the support. On each of two opposite sides of each opening 17 there is mounted a pillow block 18 and mounted for rotation in each pair of pillow blocks, there is a shaft 19. Mounted upon each of the shafts 19, and arranged between the pillow blocks 18 there are two pulleys 20 and 21, and the belts 16 heretofore mentioned pass around these pulleys and are so arranged that they may be engaged with either one of said pulleys 20 or 21. One of these pulleys is loose and the other is fixed with respect to its shaft 19, and when a belt 16 is engaged with a loose pulley, its shaft 19 will not be driven but said shaft 19 will be driven when a belt 16 is engaged with that pulley which is fixed thereto. Carried by each end of each shaft 19, and arranged preferably outside of the pillow blocks 18 there is an eccentric 22, and extending from each eccentric to a lapping unit, there is an operating rod 23.

The lapping units A are preferably so constructed that of two articles being lapped together, one will be held against movement and the other will be moved relatively thereto. To accomplish this result, each lapping unit includes a stationary work support and a movable work support and in the present embodiment of the invention, the stationary work support comprises a standard 25 having a foot 26 by means of which the standard may be mounted upon a suitable base plate 27 carried by the support 10. Suitable fastenings such as bolts 28 may be employed to secure the base plate 27 to the support 10 and the standard may be secured to the base plate by bolts 29 or in any other manner which will permit of quick

and easy removal of the standard 25 relatively to the base plate 27.

The upper end of the standard is enlarged as at 28' and is provided with a passage 29 in which is mounted a shaft 30. Carried by the enlarged portion 28' and having an extension 31, there is an arm 32, the arm being so shaped that the extension is spaced from the enlarged portion 28' as indicated by the reference character B. The extension 31 receives and supports against sagging, the end 33 of the shaft 30 and said shaft bridges the space B as best illustrated in Figure 3 of the drawings.

Secured to the enlarged portion 28' as by bolts 34 there is a bearing member 35 having an exteriorly threaded extension 36 and threaded thereon there is a nut 37 adjacent the outer face of which there is a washer 39. An abutment member 40 is secured to the adjacent end of the shaft 30 as by a cross-pin 41 and interposed between the nut 37 and the abutment member 40 there is an anti-friction bearing 42. This construction provides a thrust bearing for one end of the shaft 30. The opposite end of the shaft has keyed thereto as at 43, a flanged sleeve 44 and interposed between the flange thereof and a washer 45 there is a coil spring 46. This coil spring is placed under tension by adjustment of the nut 37 and tends at all times to produce thrust upon the thrust bearing heretofore described.

The movable work supports each consists of a depending arm 50 secured as at 51 to the shaft 30. This depending arm has an enlarged portion 52 which occupies a position in the space B heretofore mentioned which enlarged portion has a passage 53 for the reception of the shaft 30. The operating rods 23 heretofore mentioned are pivotally connected as at 55 to the movable work supports and said cranks form the means by which the depending arms are rocked to produce the lapping operation.

In its present embodiment, the invention is illustrated in a machine for lapping the cutting edges of a pair of shears or scissors jaws and in such a machine one of a pair of jaws is held stationary, the other jaw being moved relative thereto and in wiping contact therewith.

In the accompanying drawings, the stationary jaw is designated C, the movable jaw being designated D. In operation, the jaws of a scissors or shears are pivotally connected together in crossed relation and I make use of this construction to perform the lapping operation by mounting the jaws upon the shaft 30 which passes through the openings in the jaws in which the pin which pivotally connects the jaws for operation is mounted as illustrated at E in Figure 3.

The scissors or shears jaws are held or secured to their respective work support by suitable clamps 60, see Figure 5, which are secured in position by bolts or screws 61 the clamps engaging the jaws as at 62 in said Figure 5.

In the present embodiment of the invention, scissors or shear jaws having serrated edges have been employed to illustrate the articles being lapped and in the case of such devices the two inner clamps 60 are provided with channels 60' which, when the jaws are placed in position upon their supports, coincide with the serrations or spaces between the projections of the serrated edges of the jaws. These channels are curved, and the arc of this curve corresponds to the arc of movement of the movable work support during the lapping operation.

In some instances, particularly in the case of

scissors or shear jaws, the articles being lapped, taper and do not engage the work support by which they are carried throughout their entire length and consequently would not be firmly supported thereby.

Means is employed to provide firm support for articles of this general type and one practical embodiment of such a means consists of a bolt threaded into each of the work supports. These bolts are designated 65' and by reference to Figure 2 of the drawings it will be noted that the inner end of each of these bolts engages that scissors or shear jaw mounted upon that work support in which the bolt is threaded, thus providing for holding the scissors or shear jaws against flexing during the lapping operation.

As thus far described, the device operates in the following manner: The scissors or shears jaws having been mounted as heretofore described, the belts 16 are engaged with the fixed pulleys upon the shafts 19 and through the medium of the operating rods 23 the movable work supports 50 are operated and the jaws carried thereby are moved relative to and in wiping contact with their respective stationary work support and the jaw carried thereby. As the lapping operation continues and adjustment of the movable work support relative to the stationary work support becomes necessary, it is only necessary to adjust the nut 37 upon the threaded extension of the sleeve 35 in the proper direction to produce thrust in an outward direction or to the right in Figure 3. This action moves bodily the shaft 30 and the movable work support to the right in Figure 3 and thus shifts the jaw carried thereby into more intimate relation with the fixed jaw to increase the degree of lapping produced by the operation.

By merely grasping the nut 37, an experienced operator can determine the extent to which the lapping is being done and can make the necessary adjustments in the manner above described.

Means is provided to supply a suitable abradant material to the surfaces being operated upon. The abrading material preferred is in the form of an oil carrying in suspension a finely pulverized abradant powder.

Such an abradant is placed in a suitable supply tank 70, see Figure 1. Leading from this supply tank there is a main supply pipe 71 having a control valve 72. Branching off from this supply pipe 71 to each lapping unit A there is a branch pipe 73 and each branch pipe is provided with a control valve 74. Each branch pipe 73 communicates with a passage 75 in the enlarged portion 28 of its respective lapping unit A, see Figure 3. This passage 75 discharges into a pan 76, see Figure 2, and the pan 76 discharges directly onto the surfaces being operated upon from its spout 77. The abradant drips from the articles being operated upon into a pan 78 which discharges through a pipe 79 into a trough 80 which in turn conveys the abradant to a receptacle 81, it being understood that there is a trough 80 extending along each side edge of the support 10 and that there is a receptacle 81 for each trough.

From the foregoing, it will be readily apparent that the present invention provides a lapping machine which is highly efficient and in which the lapping operation may be effected with a high degree of accuracy and speed.

While the invention has been herein illustrated in a preferred form, it is to be understood that the invention is not to be limited to the specific construction or details herein illustrated, and that it

may be practiced in other forms without departing from the spirit thereof.

Having thus described the invention, what is claimed as new and what it is desired to secure by Letters Patent of the United States, is:

1. A lapping unit comprising a support, a standard extending vertically therefrom, a shaft mounted in said standard, an arm extending from said standard and having its free end spaced therefrom to provide a partial support for said shaft, a second arm depending from said shaft and mounted thereon between the standard and the free end of the first mentioned arm, and means for adjusting the shaft and the second mentioned arm relative to said standard, and means for securing articles to be lapped to said standard, and said second mentioned arm.

2. A lapping unit comprising a standard, a shaft carried thereby, a movable arm carried by said standard, means for operating said movable arm, and means for securing articles to be lapped to said standard and said movable arm, said articles to be lapped being carried on said shaft.

3. A lapping unit comprising a standard, a shaft carried thereby and forming supporting means for articles to be operated upon by the unit, an arm mounted on said shaft and depending in juxtaposition to said standard, means for securing articles to be lapped to said standard and said movable arm, means for operating said movable arm, and means for adjusting said movable arm relative to said standard.

4. In a lapping machine, a lapping unit comprising a stationary work support, a movable work support, a shaft carried by the stationary work support and movable relative thereto,

means for attaching the movable work support to said shaft, means for moving said shaft longitudinally in one direction relative to the stationary work support and separate means for moving said shaft longitudinally in the opposite direction relative to said stationary work support, said first mentioned means comprising a sleeve fixed to the shaft and resilient means interposed between the sleeve and the stationary work support, said second mentioned means including an abutment fixed to the shaft, a thrust bearing interposed between the fixed work support and said abutment and means for moving said thrust bearing relative to the stationary work support.

5. In a lapping machine for forming complementary serrated cutting edges on scissors or shears jaws, a pair of jaw carrying members, and means for securing said jaws to their respective members, said securing means having channels co-incident with the serrations in the scissors or shears jaws.

6. In a lapping machine for forming complementary serrated cutting edges on scissors or shear jaws, a pair of jaw carrying members, and clamping blocks for securing said jaws to their respective members, said clamping blocks having channels formed therein and which coincide with the serrations of the scissors or shear jaws.

7. In a lapping machine, a pair of members for mounting the articles to be lapped, and adjustable means carried by each of said members and movable into engagement with articles to be lapped and carried thereby to prevent flexing of the articles during a lapping operation.

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