June 7, 1932. C. R. MOON 1,862,277

BUFFING MACHINE

Filed Sept. 29, 1930 3 Sheets-Sheet 1

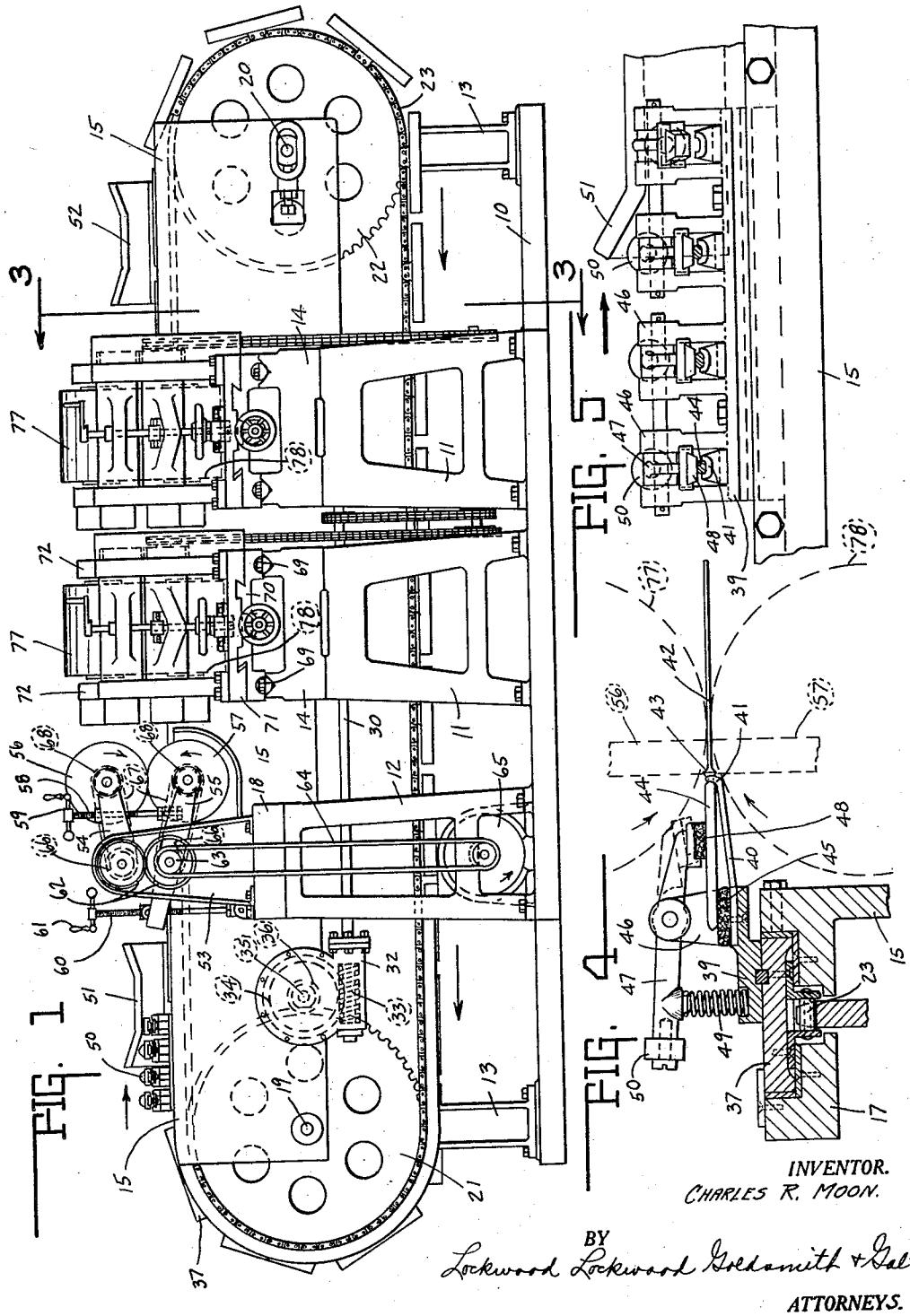


FIG. 1

FIG. 5

FIG. 4

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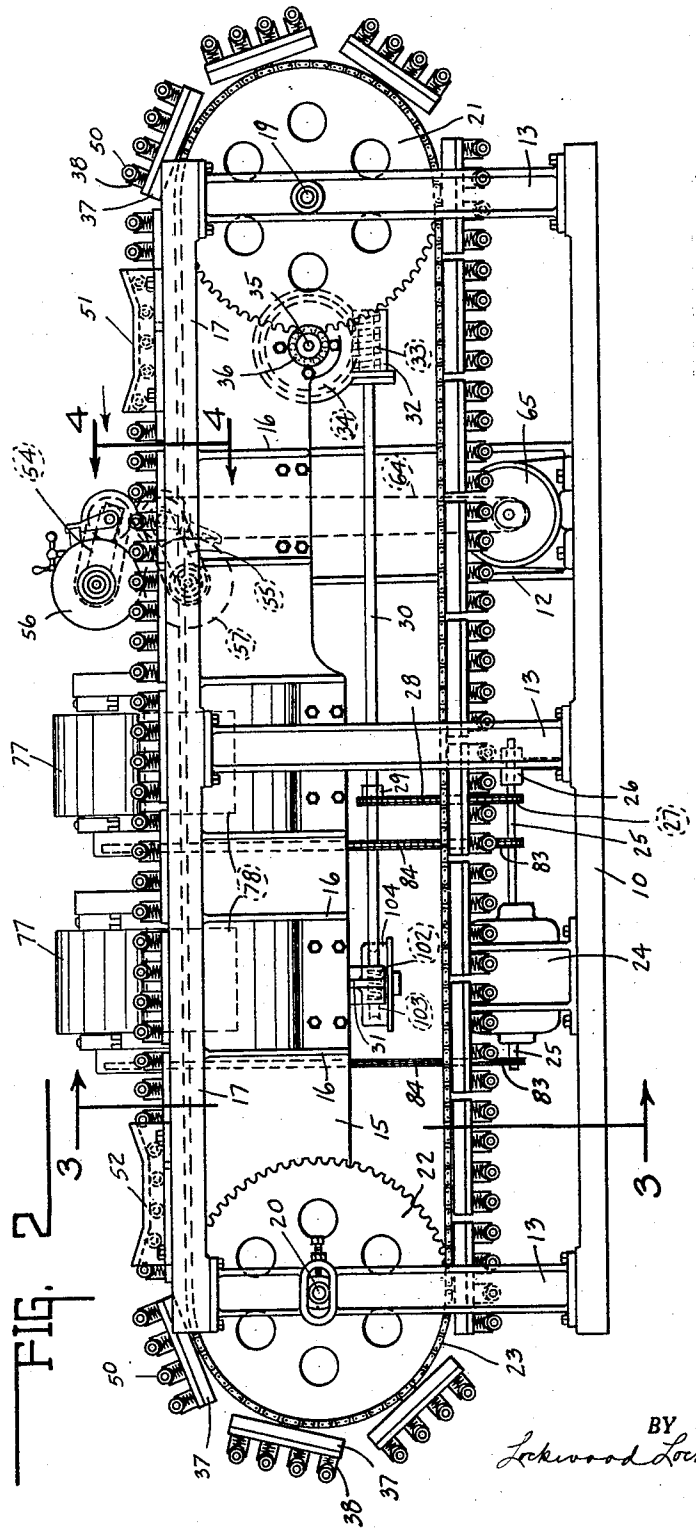


FIG. 2

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BUFFING MACHINE

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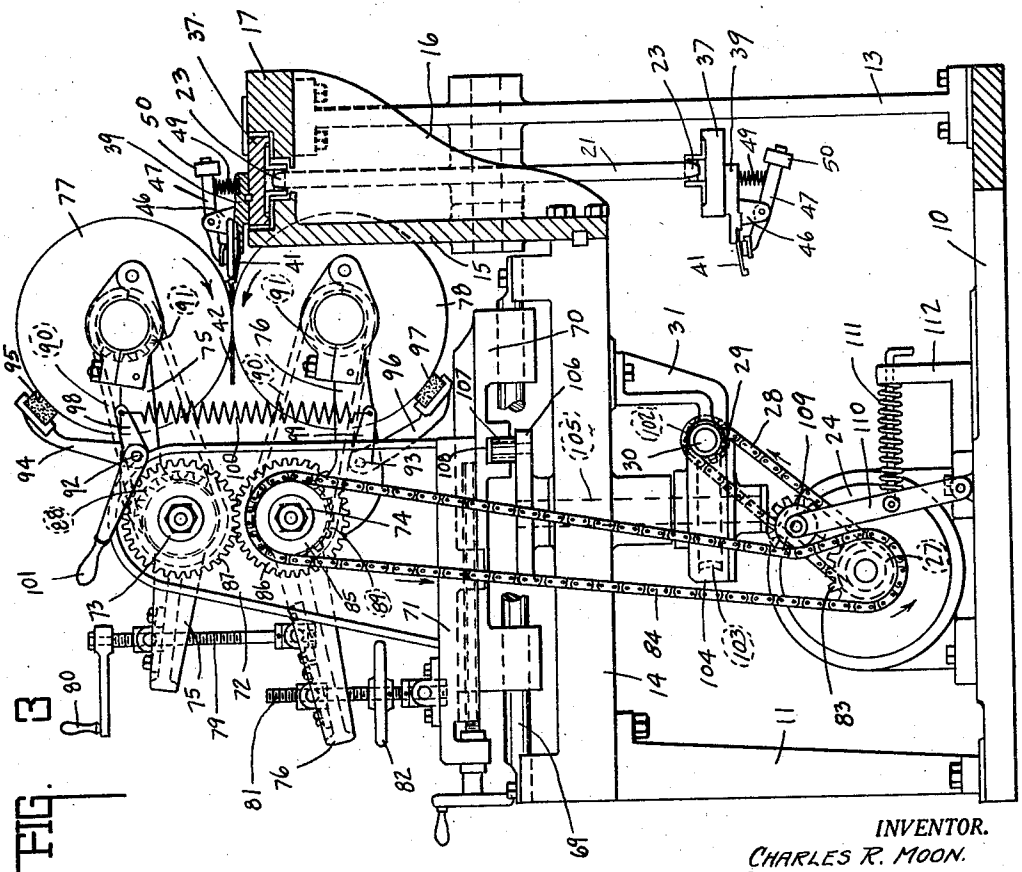


FIG. 3

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UNITED STATES PATENT OFFICE

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BUFFING MACHINE

Application filed September 29, 1930. Serial No. 485,087.

This invention relates to a buffing machine. The machine herein described is particularly adapted for the final polishing or buffing of table knives. Certain features of the invention, however, are equally applicable to other uses, as will be hereinafter made apparent.

The principal object of the invention is to provide a machine which buffs or polishes a large number of articles with the least amount of manual labor. By means of the invention, the manual labor involved consists only in the placing of the articles upon a convenient rest and the removal of the articles therefrom when the buffing operation is complete. This is preferably done by two operators, one placing the articles in the machine and the other removing them therefrom. The speed of the machine is so adjusted that the articles are buffed at a rate as rapid as can be maintained by the operators in placing and removing the articles.

The machine herein described includes a travelling conveyor carrying a plurality of grasping units, each adapted to grasp an article to be buffed. Cams are provided at the proper points in the travel of the conveyor to engage the grasping units for moving the same to non-grasping position for the insertion and removal of articles therefrom. Between these cams a plurality of buffing wheels are located in the proper positions to engage and polish the various parts of the article carried by the grasping units. When the article to be buffed is a table knife of the common form, the grasping unit is adapted to grasp the handle, leaving the blade projecting in position to engage the buffing rolls. A pair of rolls mounted on axes parallel to the axis of the knife blade are used for buffing the blade adjacent the bead. The remainder of the blade is buffed by rolls having axes transverse thereto. These rolls are given a reciprocating motion in the direction of the axes of the blades and, therefore, completely polish the remainder of the blade.

Other features of the invention reside in the specific form of the grasping units, the specific form of support for the buffing rolls and the specific form of apparatus used to impart the necessary motions thereto.

The full nature of the invention will be understood from the accompanying drawings and the following description and claims.

Fig. 1 is an elevational view of the machine taken from the front or operator's side. Fig. 2 is an elevational view of the opposite side. Fig. 3 is a sectional view taken on the lines 3—3 of Figs. 1 and 2. Fig. 4 is a sectional detail of the grasping units employed for grasping table knives. Fig. 5 is a fragmentary detail of a portion of Fig. 1 drawn to an enlarged scale.

In the drawings a base plate 10 has resting thereon a pair of A-frames 11, an A-frame 12 and three upright frame members 13. Each of the A-frames 11 supports one end of a horizontal bed plate 14 extending toward the rear of the machine and fastened to a vertical plate 15. The vertical plate 15 extends substantially the whole length of the machine and is formed with ribs 16 supporting an outer guide rail 17. The guide rail 17 is in turn supported upon the vertical frame members 13. The A-frame 12 carries one end of a horizontal bed plate 18 fastened at its other end to the vertical plate 15.

A horizontal shaft 19 at one end of the machine is carried upon suitable bearings in the plate 15 and one of the vertical frame members 13. A similar shaft 20 at the opposite end of the machine is carried upon adjustable bearings in the plate 15 and another of the vertical frame members 13. Sprockets 21 and 22 are carried by the shafts 19 and 20, respectively. A sprocket chain 23 is trained about the sprockets 21 and 22.

An electric motor 24 is mounted upon the base plate 10 and is provided with an extended shaft 25 resting in a bearing 26 also carried by the base plate 10. A sprocket 27 is carried by the shaft 25 and has trained thereabout a sprocket chain 28. The chain 28 is also trained about a sprocket 29 carried upon a horizontal shaft 30. The shaft 30 is supported upon brackets 31 carried by the bed plates 14 and also finds a bearing within a worm gear housing 32. Within the housing 32 the shaft 30 is fitted with a worm 33 engaging a worm wheel 34 carried upon a shaft 35. The shaft 35 and housing 32 are

supported upon the plate 15 and the shaft 35 carries a pinion 36 engaging the sprocket 21 for driving the same. By this means the motor 24 continuously drives the sprockets 21 and 22 and sprocket chain 23.

The chain 23 carries a plurality of blocks 37, each carrying a plurality of grasping units 38, each of which is adapted to grasp a knife to be buffed. The blocks 37 are adapted to run in a guideway formed between the upper edge of the plate 15 and the guide rail 17 as shown in Figs. 3 and 4. The grasping units carried by the said blocks each consist of a base 39 having an extending arm 40 fastened thereto. Each arm 40 terminates in an upwardly-extending bifurcated portion 41 adapted to grasp a knife 42 at a point between the bead 43 and the handle 44. A rest 45 is also carried by each base 39 and is adapted to support the extreme end of the knife handle 44. Brackets 46 extend upwardly from the bases 39 and pivotally support levers 47, each carrying at one end a pad 48 adapted to engage the handle 44 of the knife at a point between the bifurcated rest 41 and the rest 45. A compression spring 49 is interposed between the opposite arm of each lever 47 and the base 39 and normally maintains the corresponding pad 48 in grasping relation with the knife handle. Each lever 47 also carries at the end adjacent the spring 49 a roller 50. A pair of cams 51 and 52 are carried by the guide rail 17 in position to engage the rollers 50 for forcing the same downward and moving the pads 48 into non-grasping position.

In placing the knives in the grasping units, the operator grasps the knife by the blade and when the pad 48 has been elevated by the engagement of the roller 50 and cam 51, the knife is placed upon the rests 41 and 45 in the position shown in Fig. 4. Since the center of gravity of a table knife is on the handle side of the bead, the knife maintains this position without attention of the operator until the cam 51 has been passed and the pad 48 has been returned to grasping position. It is, therefore, not necessary for the operator to maintain his hold upon the knife blade until the pad 48 comes to rest. Thus, an extremely short time is required for the operator to place a knife in a grasping unit. When the grasping unit reaches the cam 52, the knives are removed therefrom in a similar manner.

The horizontal bed plate 18 carries a bracket 53 upon which is pivotally mounted a pair of levers 54 and 55. At the outer end of the levers 54 and 55 there are mounted rotatable buffing rolls 56 and 57, respectively. A threaded connecting member 58, operated by a handle 59, is fastened to the levers 54 and 55 for adjusting the relative position thereof. A similar threaded stem 60 operated by a handle 61 connects an arm of the lever 55 to the base of the bracket 53 and serves for simultaneously adjusting the position of both rolls 56 and 57. Two intermeshing gears 62 are mounted concentrically with the pivotal mountings of the levers 54 and 55. One of the said gears is fitted with a pulley 63 driven by a belt 64 in turn driven by a motor 65. The gears also have connected thereto sprockets 66 adapted to drive the corresponding buffing rolls by means of chains 67 and sprockets 68 carried by said rolls. Thus, the rolls are rotated by the motor 65 independently of the adjusted positions of the levers 54 and 55.

The rolls 56 and 57 are disposed in the path of travel of the knife blade with their axes substantially transverse to said path of travel in such manner that they engage the blade and the edge of the bead as illustrated in Fig. 4. Thus, these rolls polish a portion of the knife blade which cannot be reached by the reciprocating rolls heretofore mentioned and hereinafter described in detail.

Each of the bed plates 14 carries a pair of horizontal bars 69 of substantially circular cross section. These bars support horizontally-slidable carriages 70 each in turn supporting a horizontally-adjustable carriage 71 carrying upwardly-extending brackets 72. The brackets 72 support horizontally-disposed shafts 73 and 74 upon which are pivotally mounted levers 75 and 76 respectively. At the outer end of the said levers rotatable buffing rolls 77 and 78 are carried. A threaded connecting member 79, operated by a handle 80, connects each of the levers 75 and the corresponding lever 76 and serves to adjust their relative positions. A similarly threaded connecting member 81, operated by a hand wheel 82, connects each lever 76 with the corresponding carriage 71 and serves to simultaneously adjust the positions of the levers 75 and 76. The shaft 25 of the motor 24 carries a pair of sprockets 83, each carrying a chain 84 trained about a sprocket 85 on one of the shafts 74. Each of said sprockets is directly connected to a gear 86 meshing with a gear 87 carried upon the corresponding shaft 73. Sprockets 88 and 89 are fastened to the gears 87 and 86 respectively and each serves to rotate its corresponding roll by means of sprocket chains 90 and 91 connected to said rolls.

The brackets 72 also carry shafts 92 and 93, the shaft 92 carrying an arm 94 in turn carrying a cake 95 of rouge or other buffing material and the shaft 93 carrying an arm 96 in turn carrying a similar cake of rouge 97. The rouge cakes 95 are positioned to engage the rolls 77 for maintaining a supply of buffing material thereon. The cakes 97 similarly engage the rolls 78. Levers 98 and 99, carried by the shafts 92 and 93, respectively, are connected by a tension spring 100 which serves to maintain the rouge cakes

in yielding engagement with the rolls 77 and 78. A handle 101 carried by shaft 92 is used for momentarily increasing or decreasing the pressure of either rouge cake upon its roll and also for moving the levers 94 and 96 into position for removal and replacement of rouge cakes.

The shaft 30 at its points of support upon each of the brackets 31, carries a worm 102 engaging a worm wheel 103 carried within a gear housing 104 supported upon the said bracket 31. Each of the worm wheels 103 is carried upon a vertical shaft 105 extending upwardly through the corresponding bed plate 14 and carrying a crank plate 106 upon its upper end. Each crank plate 106 in turn carries a pin 107 engaging a transverse groove 108 in the corresponding carriage 70. By this means, the carriages 70, the carriages 71 carried thereby, the brackets 72 and rolls 77 and 78 are reciprocated in a direction transverse to the line of travel of the knives and substantially parallel to the axes of the knife blades. This reciprocation is so rapid that each knife blade is completely traversed at least once by each pair of rolls 77 and 78.

During the said reciprocation, the tension upon each of the chains 84 is maintained by means of an idler sprocket 109 carried upon a lever 110 pivotally mounted upon the base member 10. A compression spring 111 is inserted between the levers 110 and the bracket 112 for maintaining the idler 109 in the proper position.

By means of the apparatus described it is apparent that all parts of a knife blade can be completely buffed without attention of the operator other than the placing of the knives in the rests and the removal of the same therefrom. The pressures of the buffing rolls may be adjusted as desired and the necessary reciprocating motions are imparted to the rolls without disturbing the mechanism for rotating the same.

The invention claimed is:

1. In a buffing machine for knives, the combination of a travelling carrier adapted to carry a plurality of knives with their axes transverse to their line of travel, a pair of rotatable buffing rolls positioned with their axes transverse to said line of travel, said rolls being adapted to engage the blades of said knives adjacent the bead for buffing the same, a pair of rotatable buffing rolls positioned with their axes substantially parallel to said line of travel, said rolls being adapted to engage said blades for buffing the same, and means for reciprocating said last-mentioned rolls in a direction transverse to said line of travel.

2. In a buffing machine for knives, the combination of a travelling carrier adapted to carry a plurality of knives with their axes transverse to their line of travel, a reciprocable carriage movable in a direction transverse to said line of travel, a pair of levers pivotally supported upon said carriage, a buffing roll carried by each of said levers, said rolls having their axes substantially parallel to said line of travel and being adapted to engage the upper and lower surfaces respectively of the blades of said knives, a pair of intermeshing gears carried by said carriage concentrically with the pivotal mountings of said levers, a driving connection between each of said gears and its corresponding roll for rotating the same, mechanism for reciprocating said carriage, and mechanism for rotating one of said gears independently of the movement of said carriage.

3. In a buffing machine for knives, the combination of a travelling carrier adapted to carry a plurality of knives with their axes transverse to their line of travel, a reciprocable carriage movable in a direction transverse to said line of travel, a pair of levers pivotally supported upon said carriage, a buffing roll carried by each of said levers, said rolls having their axes substantially parallel to said line of travel and being adapted to engage the upper and lower surfaces respectively of the blades of said knives, a pair of intermeshing gears carried by said carriage concentrically with the pivotal mountings of said levers, a driving connection between each of said gears and its corresponding roll for rotating the same, mechanism for reciprocating said carriage, power means mounted independently of said carriage, a sprocket and chain connection between said power means and one of said gears for rotating the same, and a yieldingly-mounted idler sprocket engaging said chain for maintaining the same in driving relation independently of the movement of said carriage.

4. In a buffing machine for knives, the combination of a conveyor, a plurality of rests carried by said conveyor for supporting articles to be buffed, said rests each having a portion adapted to engage a knife between the bead and the handle and a portion adapted to engage the handle near its end, grasping members adapted to engage the opposite sides of said handles between said rest portions, yielding means for maintaining said members in grasping position, one or more buffing rolls adapted to engage said articles for buffing the same during their travel, and a cam adapted to engage said grasping members at one point in their travel for moving the same into non-grasping position.

In witness whereof, I have hereunto affixed my signature.

CHARLES R. MOON.