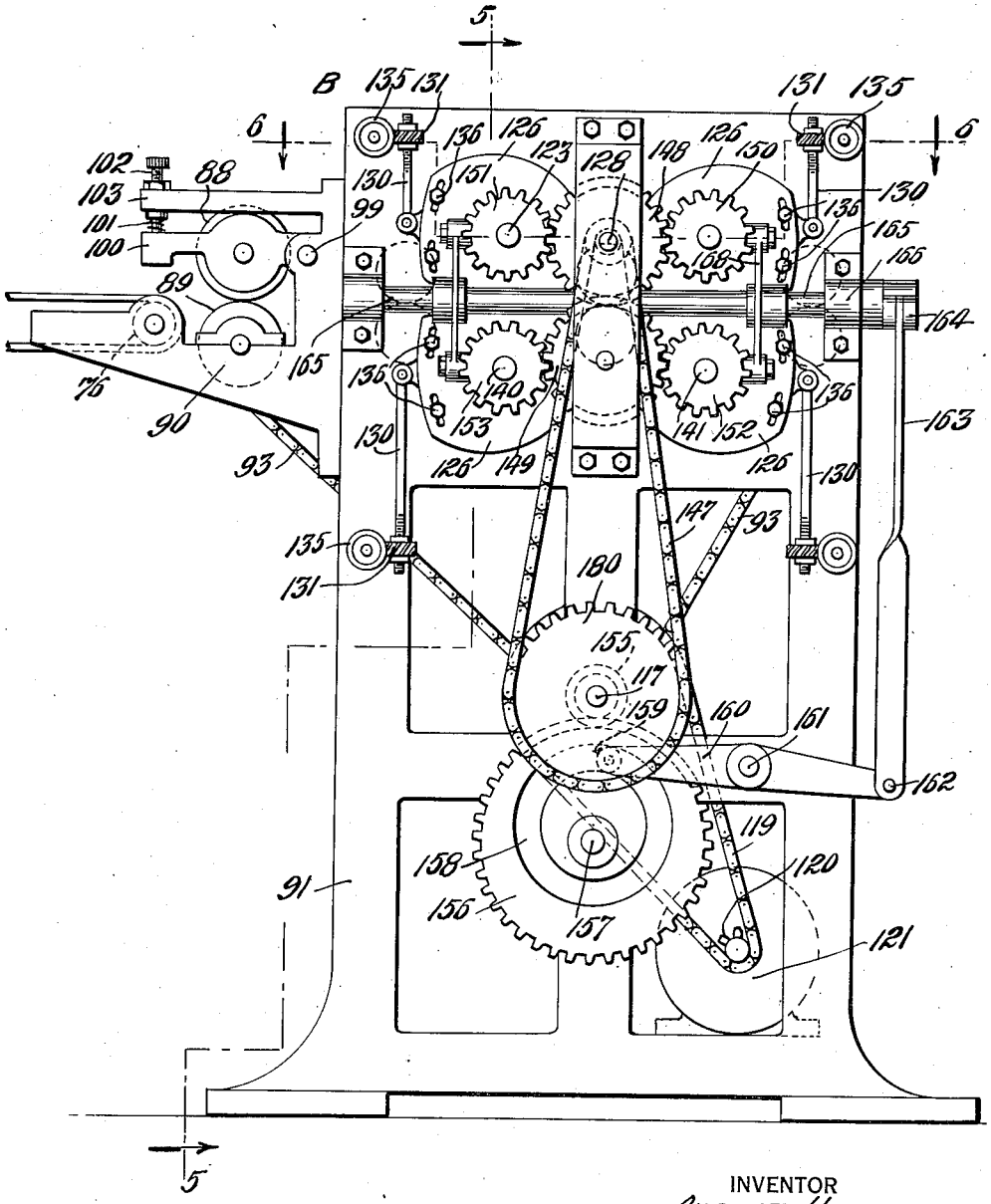
June 10, 1941. A. HORMEL 2,245,341

BUFFING MACHINE

Original Filed Aug. 18, 1937 3 Sheets-Sheet 1

Fig. 1.



INVENTOR
AUGUST HORMEL
BY Julius A. Smith
ATTORNEY

June 10, 1941. A. HORMEL 2,245,341

BUFFING MACHINE

Original Filed Aug. 18, 1937 3 Sheets-Sheet 2

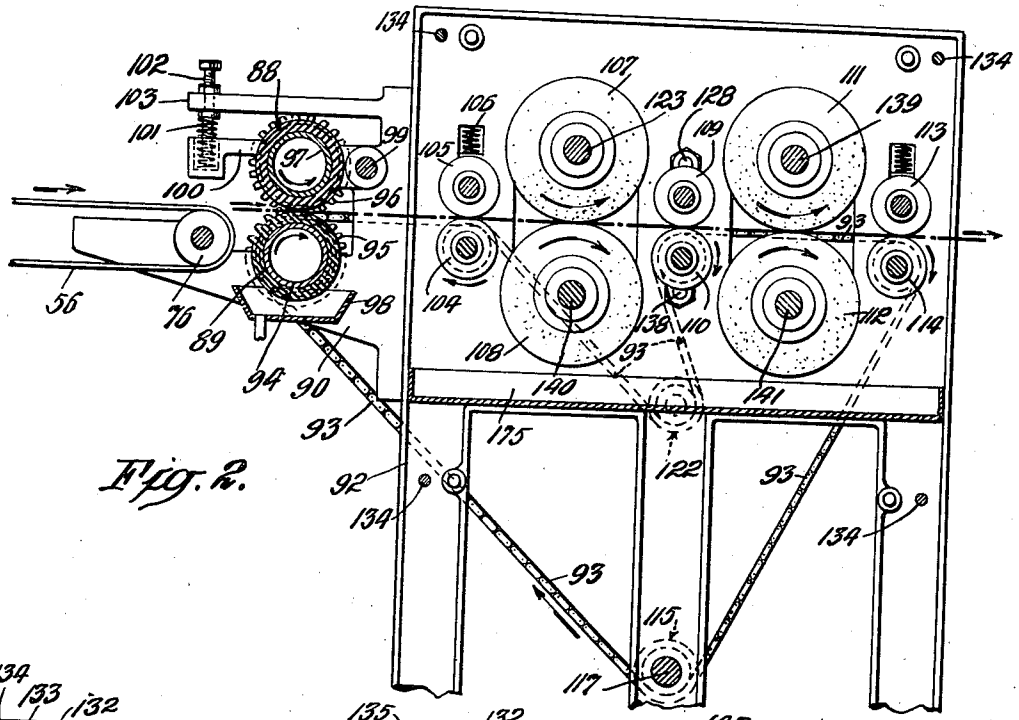


Fig. 2.

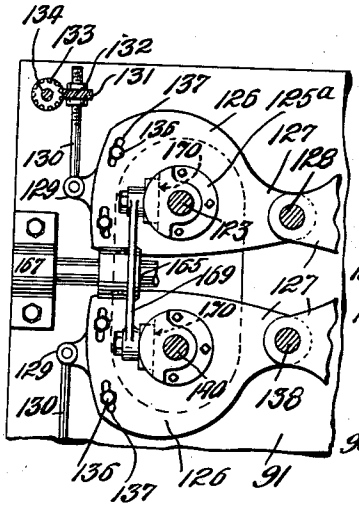


Fig. 4.

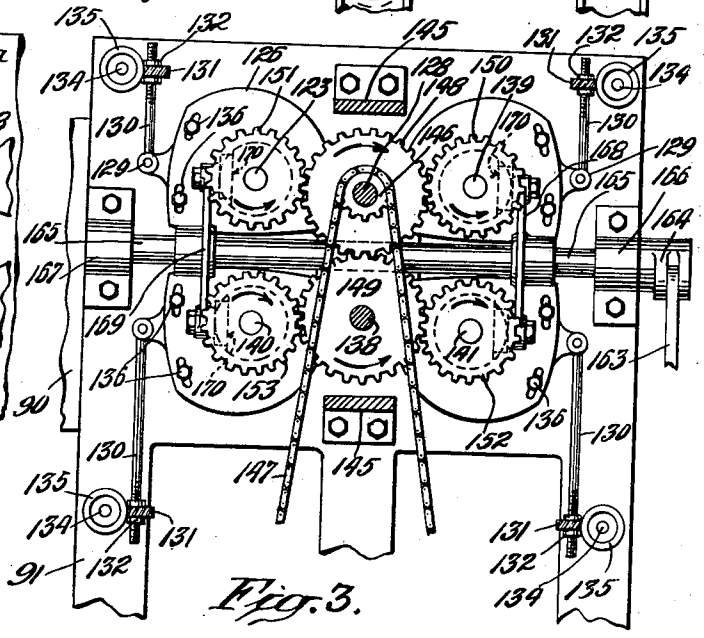


Fig. 3.

INVENTOR
AUGUST HORMEL
BY
ATTORNEY

June 10, 1941. A. HORMEL 2,245,341

BUFFING MACHINE

Original Filed Aug. 18, 1937 3 Sheets-Sheet 3

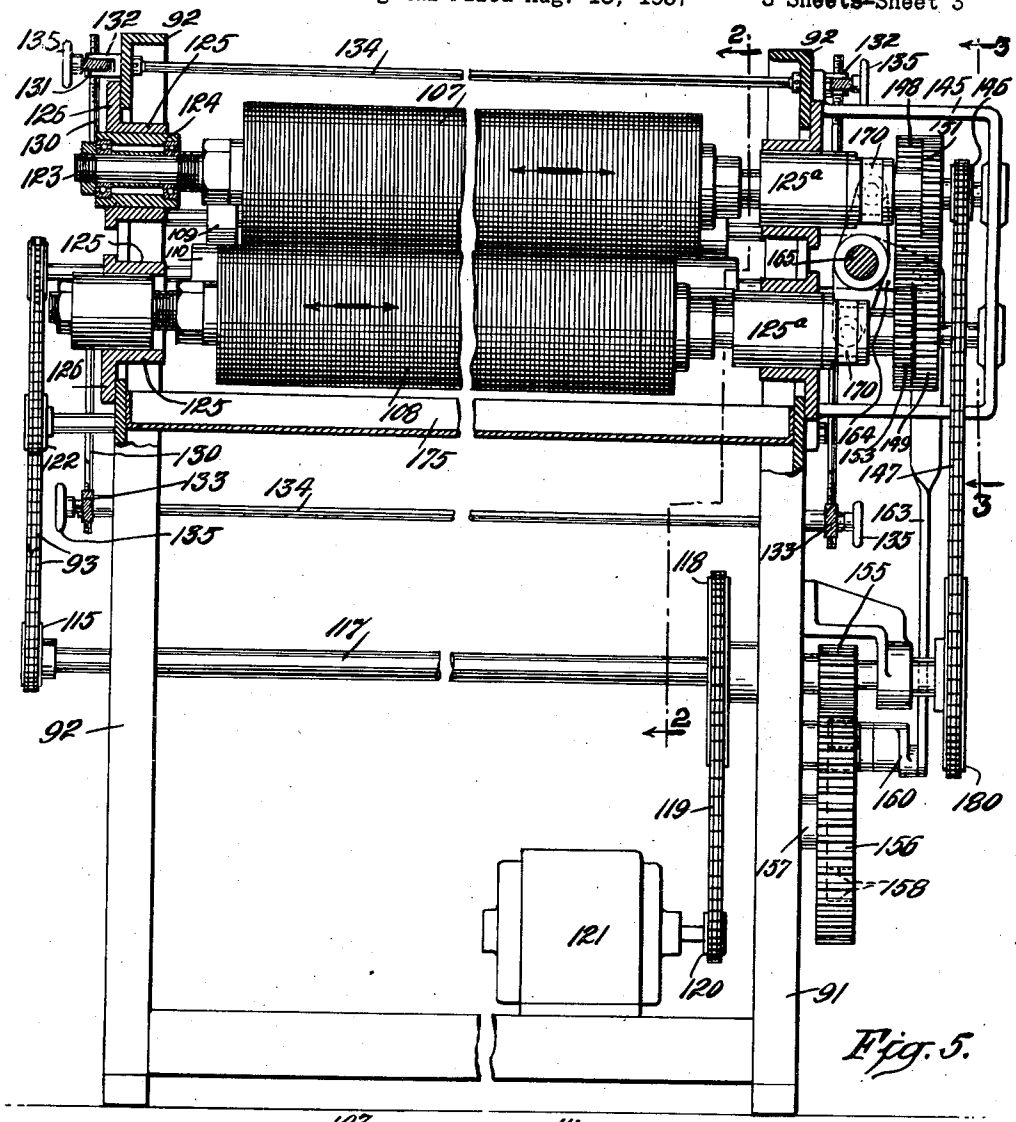


Fig. 5.

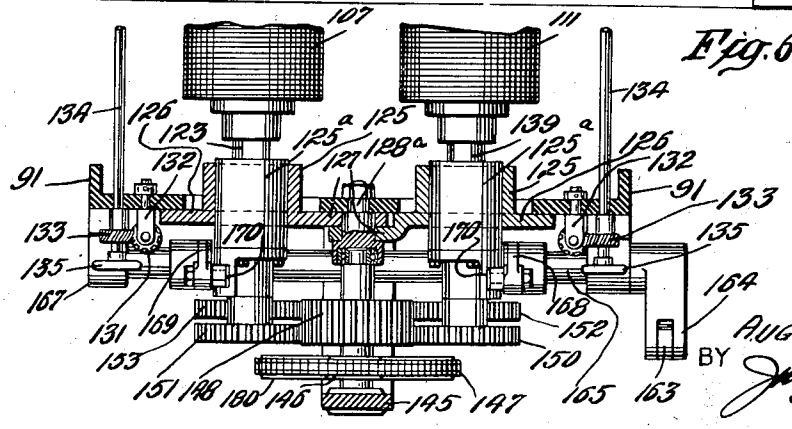


Fig. 6.

INVENTOR
AUGUST HORMEL
BY
ATTORNEY

Patented June 10, 1941 2,245,341

UNITED STATES PATENT OFFICE

2,245,341

BUFFING MACHINE

August Hormel, Hoboken, N. J., assignor to National-Standard Company, a corporation of Michigan

Original application August 18, 1937, Serial No. 159,730. Divided and this application December 29, 1938, Serial No. 248,199

2 Claims. (Cl. 15—102)

This invention relates to buffing machines, and more particularly to machines of the character intended for use in connection with large sheet metal plates to which oil or other suitable liquid is applied to retard corrosive action, and the plates after being oil-treated are subjected to a buffing action to cause the oil to penetrate into the metal to as great an extent as possible. This application is a division of my co-pending application, Serial No. 159,730, filed August 18, 1937, now Patent No. 2,149,964.

The object of the present invention is to provide a machine of the character mentioned wherein buffing of the oil-treated surfaces is uniformly and speedily effected.

More particularly, the invention contemplates the provision of buffing means, including a plurality of buffing rollers between which the plate to be buffed is passed, and which by both rotary motion and axial movement, buff both surfaces of the plate simultaneously to cause the oil to penetrate into the pores of the plate.

While I have herein set forth the fact that the means disclosed is particularly adapted to buffing oil-treated plates, it will be obvious that the mechanism can, without substantial or with no alteration, be employed for buffing sheet materials or elements of a different nature from those described.

In the accompanying drawings, wherein an embodiment of the invention is shown, Fig. 1 is a side elevation of the improved machine; Fig. 2 is a sectional view through the machine, the view being taken on the line 2—2 of Fig. 5, looking in the direction of the arrows; Fig. 3 is a view of the upper portion of the driving means for the buffing rollers, the view being taken on the line 3—3 of Fig. 5, looking in the direction of the arrows; Fig. 4 is a detail view showing the adjustable mounting for the buffing rollers; Fig. 5 is a sectional view on the line 5—5 of Fig. 1, looking in the direction of the arrows; and Fig. 6 is a sectional view on the line 6—6 of Fig. 1, looking in the direction of the arrows.

The plate to be buffed is usually oil-treated by means of any suitable mechanism, an example of such mechanism being shown in my co-pending application, Serial No. 159,730, and after the plate is so treated and the excess oil removed therefrom, the plate is carried to the buffing mechanism by means of a belt conveyor, a portion of which is shown at 56. The oil-coated plate is carried by the conveyor 56 to rollers 88 and 89 rotatably mounted in supporting arms 90 secured on and projecting from the side frames 91 and 92 of the machine. These two rollers, between which the plate is moved, act to remove any excess oil from the plate. The lower roller 89 is driven by a chain 93 in a manner to be hereinafter explained, and the shaft 94 on which said roller 89 is mounted, carries a gear 95 which meshes with gear 96 on shaft 97 on which the upper roller 88 is secured. The two rollers 88 and 89 are thus driven in opposite directions, and not only feed the plate to the right, as viewed in Fig. 2, but aid in the removal of excess oil from the surfaces of the plate. A tray 98 is provided below the lower roller 89 to catch such oil as may drain down into it as the plate passes between the two rollers 88 and 89. The upper roller 88 has its shaft 97 mounted in the bracket 100, said bracket being pivoted at 99, the free end of said bracket being spring-pressed downwardly by the spring 101, the tension of which is adjusted by the screw 102 mounted in the projecting arm 103.

The plate next enters between the feed rollers 104 and 105 rotatably mounted in the side frames 91 and 92, the upper roller of this pair being spring-pressed as indicated at 106. Then the plate enters between the buffing rollers 107 and 108, said buffing rollers being followed by the feed rollers 109 and 110; which are followed by a pair of buffing rollers 111 and 112, the latter pair of buffing rollers being similar to those shown at 107 and 108. After the buffing rollers 111 and 112 is provided a final pair of feed rollers 113 and 114.

The lower feed roller in each pair, namely, those indicated at 104, 110 and 114 as well as the lower wiping roller 89 are all driven by the chain 93. Said chain is driven from a sprocket 115 secured on a shaft 117 journalled in the side frames 91 and 92. The shaft 117 carries a sprocket 118 over which a chain 119 extends, said chain being driven by the sprocket 120 secured on the shaft of motor 121 mounted on the lower or base portion of the machine frame. The shafts of each of the rollers 89, 104, 110 and 114 carry a sprocket engaged by the chain 93 in the manner clearly shown in Fig. 2, said chain being also engaged and held taut by the idler 122. Through the drive arrangement shown, all of the rollers 89, 104, 110 and 114 are driven in the same direction, or clockwise when viewed as in Fig. 2.

The buffing rollers 107, 108, 111 and 112 have a greater peripheral speed than the feed rollers 104, 105, 109, 110, 113 and 114 and are mounted to have a movement axially or longitudinally as well as a rotary movement and the means for effecting these two movements will be described. Since the mounting to permit these two movements is similar for all of the buffing rollers, only one need be described. Roller 107 for example, is mounted on a shaft 123 supported at its opposite ends in the ball bearings 124. Each bearing 124 is mounted to slide axially with the shaft through a bushing 125 provided on a plate 126, said plate having an ear portion 127 at one

of its ends loosely supported on a stud shaft 128 carried at one end in bearing 128a (Fig. 6) projecting from the side frame 91. Extending from the opposite end of said plate is a lug 129 pivotally attached to the end of an adjusting rod 130, said adjusting rod being threaded through a guide 132 and carrying a worm gear 131 engaging a gear 133 on shaft 134 mounted in the frame, said shaft being provided at both of its ends with a hand wheel 135. By manipulation of the hand wheel at either end of the shaft it will be apparent that through the engagement of the gears 131 and 133, the plate 126 may be raised or lowered on its pivot 128 whereby any one of the buffing rollers 107, 108, 111 and 112 may be brought to or from its companion roller. Bolts 136 located in the slots 137 in the plates 126 will hold any of the plates in a fixed position of adjustment. The description just given of the manner in which shaft 123 is mounted also applies to shaft 139 upon which the upper buffing roller 111 is secured. Shafts 140 and 141 are mounted similarly to shafts 123 and 139 except that the supporting plates 126 for the former shafts are supported on the stud shaft 138 located directly below shaft 128, as will be apparent from Fig. 3.

The stud shaft 128 has its outer end rotatably supported in the bracket 145 and it carries a sprocket 146 over which a chain 147 extends. Said chain is driven by sprocket 180 secured on the shaft 117. Shaft 128 carries a gear 148 which meshes with a similar gear 149 secured on shaft 138. Gear 148 meshes with gear 150 on shaft 139 and also with gear 151 on shaft 123, while gear 149 meshes with gear 152 on shaft 141 and with gear 153 on shaft 140. By means of this drive arrangement clearly shown in Fig. 3, the buffing rollers are rotated in the directions indicated by the arrows. As previously explained, these rollers are also movable axially while rotating.

Secured on drive shaft 117 is a gear 155 which meshes with a gear 156 secured on stud shaft 157 rotatably mounted in the side frame 91. Gear 156 is provided with an eccentric groove 158 in which a roller 159 on one end of a lever 160 rides. Lever 160 is pivoted on the stud 161 and its opposite end is pivotally connected at 162 to the lower end of a link 163 which has its upper end pivotally connected to an arm 164 extending radially from a rock shaft 165. Shaft 165 is rotatably mounted in the bearings 166 and 167 secured on the face of the side frame 91. Secured on the rock shaft 165 are two rocker arms 168 and 169. The upper end of rocker arm 168 engages in a groove 170 provided in the bearing 125a at one end of shaft 139 and shown at the right of the machine when viewed as in Fig. 6. The lower end of the rocker arm engages with a similar groove in the similar bearing 125a of shaft 141. Similarly, the upper end of rocker arm 169 engages with a groove 170 in the bearing for shaft 123 and the lower end of the same arm engages a groove in the bearing for shaft 140. Thus, when the link 163 is raised by action of the roller 159 in groove 158, shaft 165 will be rocked and the rocker arms 168 and 169 thereon will have their upper ends swung inwardly, or toward the left when viewed as in Fig. 7, this action causing the two upper buffing rollers 107 and 111 to be moved axially toward the left. At the same time, the lower ends of rocker arms 168 and 169, swinging to the right, will move the lower buffing rollers axially toward the right. Thus, while the rollers are all rotating, the upper roller in each pair will be moving axially back and forth while the lower roller in each pair will be also moving back and forth, but in a direction opposite to that of its upper companion.

It will be noted that the gears 148 and 149 are of substantial width so that the gears 150, 151, 152 and 153 can move axially with the shafts on which they are respectively secured without becoming unmeshed from the gears 148 or 149. Accordingly, while the rollers 107, 108, 111 and 112 are being reciprocated axially, the gears driving these rollers are constantly in mesh and the rollers are, while being reciprocated axially, kept in constant rotation.

Briefly, the operation of the machine is as follows:

The oil-treated plate, carried by conveyor 56 enters between the rollers 88 and 89 which operate against both faces of the plate to remove excess oil therefrom. Feed rollers 104 and 105 feed the plate between the buffing rollers which both rotate and reciprocate axially against both surfaces of the plate, wiping the oil well into the pores of the metal. The last pair of feed rollers, indicated at 113 and 114 moves the oil-treated and buffed plate out of the machine. A tray 175 located below the buffing rollers catches any lint or other material thrown off by the rollers during the buffing operation.

What I claim is:

1. In a machine of the character described, two pairs of buffing rollers between which an oiled plate is moved, shafts carrying said buffing rollers, each of said shafts carrying a gear, a driving gear mounted between and co-acting with one of said gears from each pair and meshing with the gears on the shafts of each of said rollers, a driven gear meshing with the driving gear and interposed between and meshing with two buffing roller gears constituting the second buffing roller gear from each pair, the driving and driven gears being each mounted on a shaft, the shafts for said driving and driven gears each pivotally supporting a pair of plates, each of said plates receiving the shaft of one of the buffing rollers, and adjusting means for each plate whereby the plate may be pivotally moved on the shaft which supports it to bring a buffing roller toward or away from its companion roller in the pair.

2. In a machine of the character described, two pairs of buffing rollers between which an oiled plate is moved, shafts carrying said buffing rollers, each of said shafts carrying a gear, a driving gear mounted between and co-acting with one of said gears from each pair and meshing with the gears on the shafts of each of said buffing rollers, a driven gear meshing with the driving gear and interposed between and meshing with two buffing roller gears consisting of the second buffing roller gear from each pair, the driving and driven gears being each mounted on a shaft, each of the shafts for the buffing rollers being rotatively carried in a plate, two of said plates being pivotally suspended on the shaft for the driving gear and two of the plates being pivotally suspended on the shaft for the driven gear, independent adjusting means for the four plates whereby each plate may be pivotally moved on the shaft which supports it to bring the buffing roller carried by it to or away from its companion roller.

AUGUST HORMEL.