

Nov. 3, 1942.

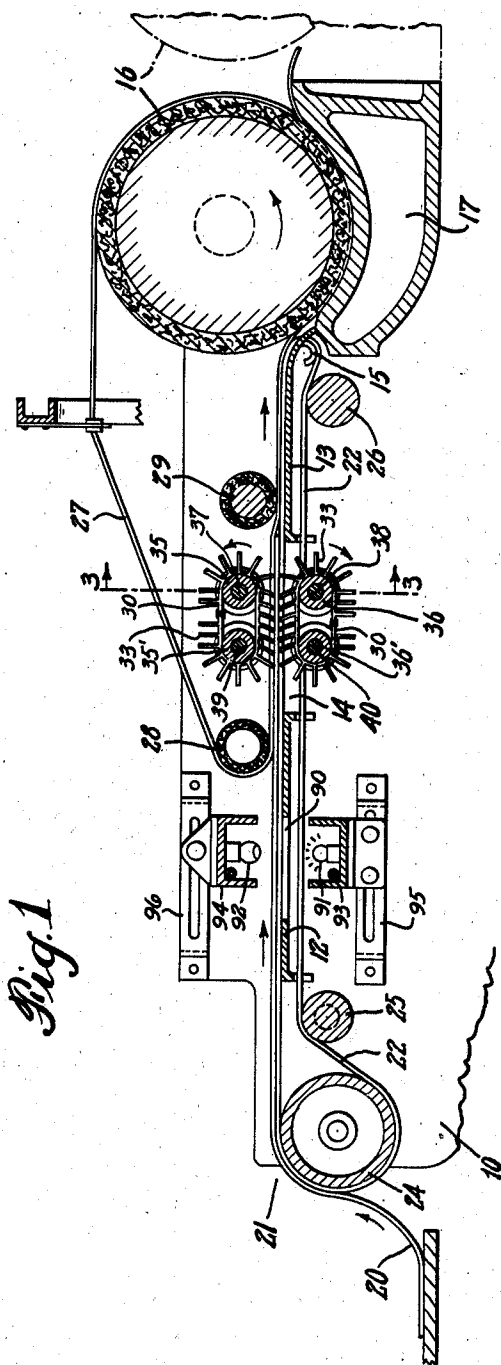
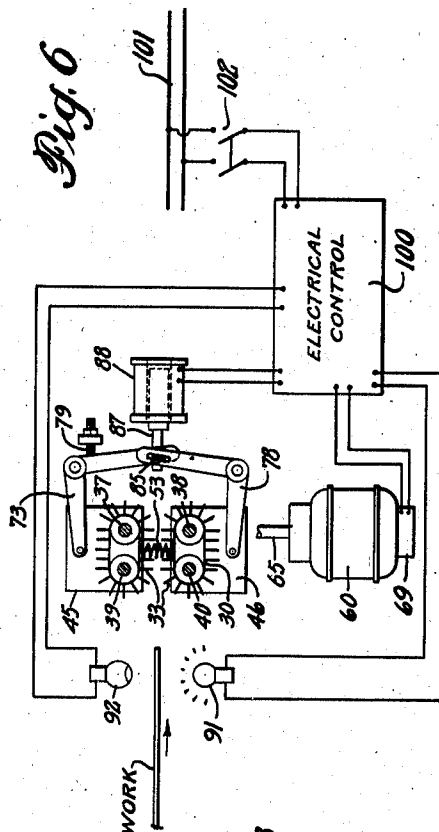
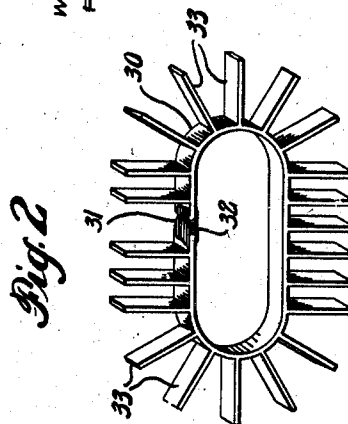
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2,300,890

SELVAGE-SMOOTHING MEANS FOR FLAT WORK IRONERS

Filed July 5, 1941

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

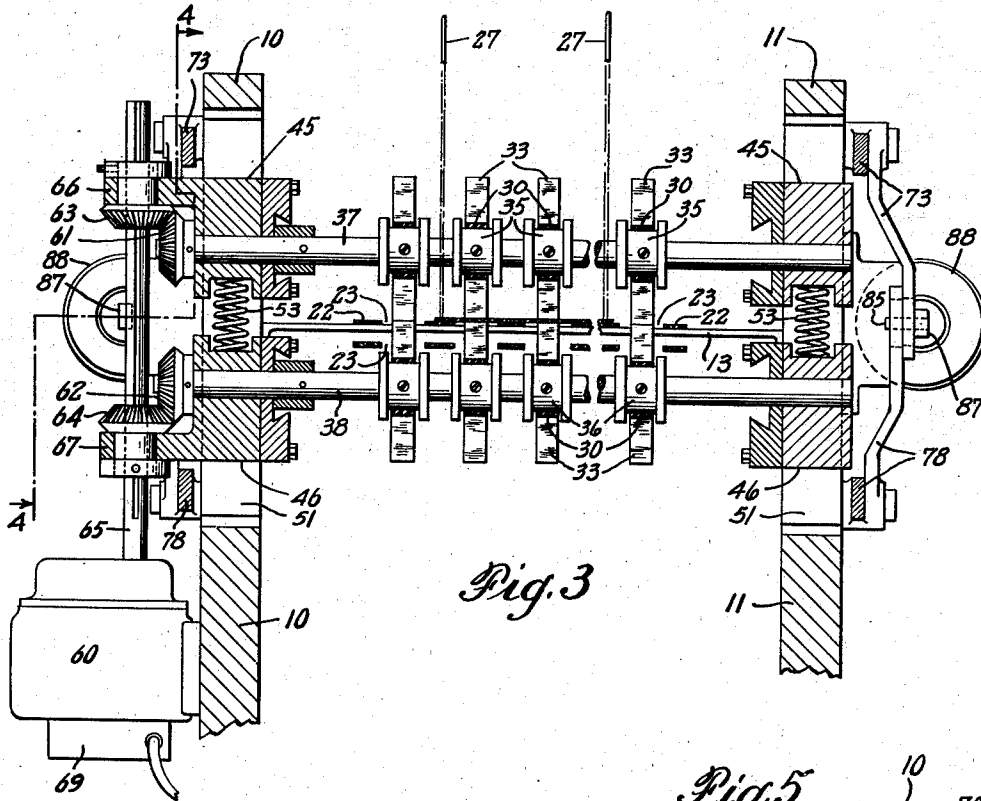


Fig. 3

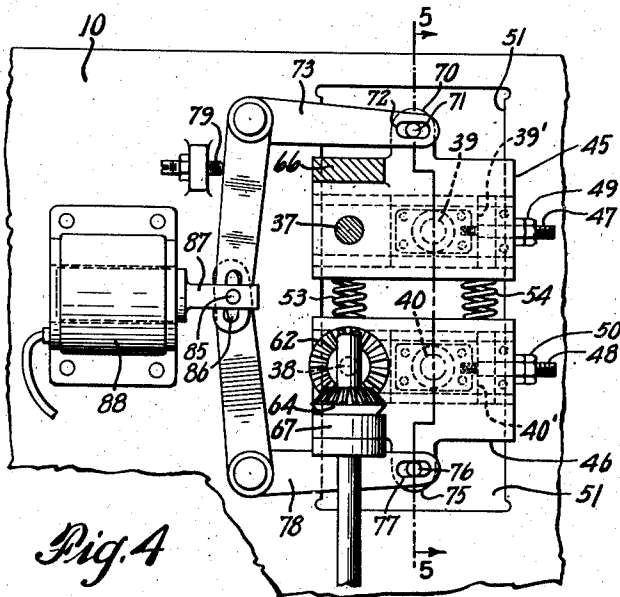
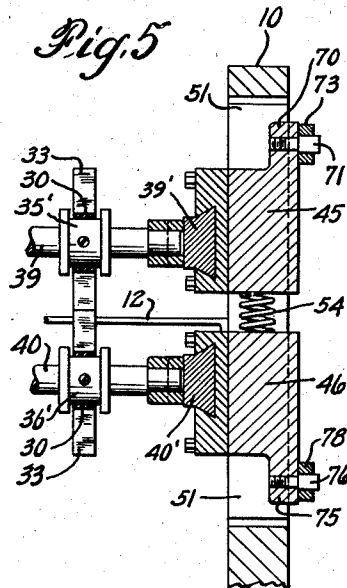


Fig. 4



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UNITED STATES PATENT OFFICE

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SELVAGE-SMOOTHING MEANS FOR
FLATWORK IRONERSCharles Edwin Hamilton, Sr., Hollywood, Calif.;
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Hamilton, Sr., deceased

Application July 5, 1941, Serial No. 401,073

2 Claims. (Cl. 38—2)

The invention relates to the class of laundry machines known generally as "flat work ironers," employed for ironing solely flat work such as sheets, towels, table cloths, napkins, etc. When introducing goods of this nature to the ironer of the usual type, the advancing and trailing edges of the work frequently are found to be turned back or wrinkled as a result of not having been previously properly shaken out. This, of course, appears as a defect when the work is delivered from the ironer.

In my prior U. S. Letters Patent #2,220,102, I have disclosed novel apparatus for expeditiously removing such defects; and in a copending application Serial #351,575, filed August 6, 1940, I have disclosed further developments wherein both the advancing and trailing edges are automatically smoothed or brushed out without necessitating removal of the work between the operations on the respective edges, as was the case with the mechanism disclosed in my aforesaid Letters Patent.

The present invention relates to novel smoothing-out or brushing means for use in apparatus of the nature set forth in my said copending application, whereby the smoothing operation is more perfectly carried out and whereby, also, danger of the work becoming involved with the brushing means is obviated in case the goods have a torn edge.

The invention has for an object to prolong the period of brushing action without necessitating any reduction in the speed of travel of the goods; also, to allow of reducing the rotational velocity of the brushes.

Another object of the invention is to provide for convenient replacement of the brushing means and for securing the desired tension on the carrying portion of the same for best action.

This is accomplished by constituting the brushing means as an extended member or succession of flexible blades or vanes, for example, by locating the latter upon a flexible travelling belt running over a pair of pulleys or the like, one of which is driven. These belts provided with outwardly extending vanes are positioned upon opposite sides of the work to afford brushing means for contacting the opposite surfaces of the goods, as in the embodiments heretofore noted. The said blades serve to smooth and to brush out both the advancing and the trailing edges of the goods, the juxtaposed portions of the belts running in the former instance in the direction of travel of the goods and in the latter instance oppositely thereto, the respective pul-

leys of pairs of juxtaposed brush members rotating in opposite directions.

The nature of the invention, however, will best be understood when described in connection with the accompanying drawings, in which:

Fig. 1 is a fragmentary longitudinal section through a flat work ironer equipped with the improved mechanism for smoothing out advancing and trailing edges of goods to be fed to the ironing rolls of said machine.

Fig. 2 shows in perspective one of the novel brushing elements.

Fig. 3 is a fragmentary transverse section on an enlarged scale, taken on the line 3—3, Fig. 1 of the drawings, and looking in the direction of the arrows.

Fig. 4 is a fragmentary sectional view taken on the line 4—4, Fig. 3 of the drawings, and looking in the direction of the arrows.

Fig. 5 is a fragmentary vertical section taken on the line 5—5, Fig. 4 of the drawings, and looking in the direction of the arrows.

Fig. 6 is a diagrammatic view illustrating the electrical connections involved in the operation of the smoothing-out mechanism.

Referring to the drawings, 10 and 11 designate the side walls of the machine frame between which are carried the various parts, including a horizontally disposed table 12 and a table 13 supported thereon in the same plane and separated from each other by a gap 14 for the purpose hereinafter set forth. Table 13 terminates in the direction of travel of the goods, indicated by the arrows, in the usual turned-down edge or comb portion 15 located in juxtaposition to the first of a series of rolls 16 mounted over a steam-chest 17 between which the goods are passed for ironing. The goods, indicated at 20, are of the nature of sheets, towels, table cloths, napkins, and other items of a flat nature, and travel from the feed end 21 of the machine over both the tables 12 and 13, being conveyed thereover to the rolls 16 by a plurality of adjacently disposed, narrow, endless tapes 22, leaving between them longitudinal spaces 23. The tapes are driven by a roll 24 extending transversely across the forward portion of the machine. Suitable idler rollers 25 and 26 for these tapes are located beneath the tables and respectively at the entrance portion of the machine just beyond roll 24 and immediately in advance of the comb 15.

Over a selected number of these tapes and designed to rest upon the top of the goods travelling over a table are a plurality of endless

strings 27 tensioned by a pair of drag rollers 28 and 29, said rollers being adapted to rest upon the goods and intermediate strings, the latter continuing under and over the periphery of the first of the ironing rolls 16. Said drag rollers are mounted above the respective table portions 12 and 13 upon opposite sides of the gap 14.

Respectively above and below said gap 14 are located the novel brushing means which are designed to cooperate for smoothing and brushing out the advancing and trailing edges of the work fed over the table 12 in the general manner set forth in my aforesaid copending application.

Reference being had more particularly to Fig. 2 of the drawings, the brushing means comprises an endless flexible belt member 30, a joint or separable connection 31 being provided in the belt as by any well known or special belt-lacing or fastener and including, for example, a removable pin 32 which, when removed, enables the belt to be opened, as for replacement or repair of the brushing means. Flexible brushing elements as the vanes 33 extend outwardly from the outer surface of the belt and the tips of the same are adapted for engagement with the work passing through the machine. These vanes or blades may be mounted in any suitable manner upon the belt surface and, preferably, are integral therewith, as indicated, as in being vulcanized thereto or cemented thereon. They extend substantially at right angles to the belt surface and are individually flexible, as in being composed of rubber, and are of sufficient length so that when opposite sets of the brushing members are juxtaposed, they will interact and wipe the surface of the goods, more especially the advancing and trailing edges thereof.

A plurality of these brushing elements extend transversely over the machine, being mounted both above and below the gap 14 and carried by series of pulleys 35, 35' and 36, 36' on respective driving shafts 37 and 38 and cooperating spindles 39 and 40 which extend transversely of the machine. Normally, the brushing means are separated and remain displaced from the gap, being brought together for peripheral contact only as an advancing or trailing edge of the work approaches the said gap 14. The lower series of brushing means is then caused to rotate in the gap for engagement with the undersurface of the work and the upper series of the brushes for engagement with the upper surface of the work. This effects complete smoothing-out of any irregularities at the respective edges of the work so that it is presented without fold or edge irregularity to the ironing rolls, the advancing and trailing edges having been properly prepared for the ironing action. Rolling-up of the work on entering the ironing rolls is thereby obviated, and the work will be finally delivered therefrom in perfect condition.

In view of the extended or elongated nature of the said brushing means in the direction of travel, the brushing action will be prolonged and continued for a sufficient period to secure a complete smoothing of the irregularities in the goods. This allows, also, of the speed of rotation of the said brushing means being reduced substantially below that required with brushing means of the nature set forth in my aforesaid copending application. Moreover, in the case of torn edges in the goods passing through the brushing means, there is no tendency for the goods to become involved with the said means, thus avoiding any delay or interruption of the brushing operation.

The control of the operation and action of the smoothing-out members or brushes may be effected mechanically or electrically, preferably by the latter system. The said brushing members, or rather their shafts 37 and 38 and spindles 39 and 40, respectively, are mounted for vertical reciprocation, being carried, for example, by means of upper and lower sliding blocks 45 and 46, at opposite sides of the machine and affording bearings also for said shafts and spindles. The latter, however, are mounted in auxiliary blocks 39' and 40', which are adjustable in corresponding ways of the blocks 45 and 46 in the direction toward and away from the respective shafts 37 and 38. Rods 47 and 48, respectively, are attached to the auxiliary blocks 39' and 40' to effect the desired adjustment and are passed through and to extend beyond the main sliding blocks 45 and 46 carrying the same, with nuts 49 and 50, respectively, fitting over the rods to secure the corresponding auxiliary blocks in position. The pairs of blocks 45 and 46, in turn, are mounted in ways 51 of the sides 10 and 11 to reciprocate vertically therein. Pairs of coil springs 53 and 54, mounted, for example, between the blocks 45 and 46, respectively, serve to hold normally separated the said blocks 45 and 46 and with them the corresponding shafts, spindles and the brush elements carried thereby.

To transmit the required rotation to the respective shafts, as from a driving motor 60 supported on the side 10 of the machine frame, shafts 37 and 38 are extended beyond, for example, the side 10 and carry at their respective outer ends bevel gear wheels 61 and 62. These in turn mesh with bevel gear wheels 63 and 64, respectively, keyed to slide on the motor shaft 65. Said shaft 65 is mounted in bearings 66 and 67 extending laterally from the corresponding blocks 45 and 46, so that the said bearings may slide axially of the shaft to accommodate the separation and approach of blocks 45 and 46 while at the same time permitting transmission of the rotation of the said shaft 65 to the shafts 37 and 38. Motor 60 is of the reversible type with limit switch means indicated by the switch box 69, so that the rotation of the motor will be interrupted at a predetermined time interval, all of which is well understood and its specific embodiment forms no particular feature of the invention.

A convenient means of effecting the approach and separation of the said shafts 37 and 38 and spindles 39 and 40 through sliding of their blocks 45 and 46 in the ways 51, is indicated in Figs. 3 and 4 of the drawings. As shown, each set of blocks is provided with lugs for pivotal attachment to bell-cranks mounted on the respective sides 10 and 11. Thus, lugs 70 provide through a pin 71 and slot 72 for pivotal connection of the blocks 45 with bell-cranks 73 pivoted to the sides 10 and 11; and lugs 75 through pins 76 and slots 77 pivotally connect the blocks 46 with bell-cranks 78. An adjustable stop 79 serves to limit the degree of approach of the blocks, while the degree of separation of the blocks under the action of springs 53 and 54 is limited by the lugs 70 and 75 striking the ends of the ways 51.

As stated, the springs maintain normally apart said blocks 45 and 46 and thus maintain the smoothing and brushing-out members out of contact. To cause these blocks to approach each other for engagement with an edge of the work moving over the table 12, provision is made for operating the bell-cranks 73 and 78 accordingly,

which may conveniently be accomplished as a toggle movement wherein the two free ends of said bell-cranks are pivotally connected through pins 85 and the slots 86 with the plunger 87 of a solenoid 88.

When the solenoid is energized and the plunger drawn inwardly, as indicated in Fig. 4 of the drawings, blocks 45 and 46 will be caused to approach each other against the action of the springs, the extent of approach being limited by stop 79. Upon interruption of the circuit to the solenoids, the springs will be permitted to act to again separate the said blocks. The arrangement is preferably such that the motor and solenoids are operated simultaneously whereby when the motor circuit is interrupted the solenoid circuit will likewise be interrupted and similarly when the motor circuit is completed, the circuit to the solenoids will be completed.

The circuit control for these operations may be manual, but it is preferred to make them automatic under the action of the fed goods themselves, which may be accomplished by well known electronic means. Thus, reference being had to Figs. 1 and 6, the table 12 may be provided with longitudinal slots 90 upon opposite sides of which are mounted one or more sources of illumination, as the electric lamp 91, and one or more cooperating photo-electric cells 92. To afford adjustments of these elements with reference to the shafts 37 and 38 in order to time the action of the smoothing means upon the goods passing over the table 12, said elements may be mounted respectively on cross-bars 93 and 94 which are supported at their ends in slotted brackets 95 and 96 secured to the side frames 10 and 11. The said elements may thus be moved longitudinally of the table in said slots and positioned at the desired location for setting in operation the smoothing and brushing means. The circuit from the photo-electric cell 92 leads to a control mechanism indicated at 100 to which power is supplied from the main 101 through intermediate switch 102. This mechanism is of any well-known or special design whereby the motor 60 and solenoid 88 will be controlled in accordance with the interruption of the light from a lamp 91 to the companion photo-electric cell 92 by the passage of the work therebetween over said table 12. When the work clears this portion of the machine, photo-electric cell 92 will again be energized and the reverse operation effected. Thus, when the work first intercepts the light from lamp 91, motor 60 will be energized for rotating the brushes in the direction of travel and at the same time solenoids 88 will be energized to cause the smoothing means to approach for a subsequent engagement with the advancing edge of the work. By opening switch 102, the entire smoothing-out operation may be dispensed with, the goods "by-passing" and travelling through the machine in the usual manner.

The location of a said lamp and photo-electric cell with respect to these smoothing and brushing means is such that the time interval will be ample to bring the latter into operative position before an edge is presented thereto. After, for example, the advancing edge has been properly smoothed out, the motor circuit is interrupted, as by the limit switch of the motor, as well as the solenoid circuits so that the brushing means will be sep-

arated and no further action will be had until the trailing edge of the work clears the slots 90 and causes a photo-electric cell 92 to be again energized.

5 During the action of brushing out the advancing edge, the remaining portion of the work will be held firmly down to the table 12 by the drag roller 28 and prevented from advancing at the speed of the brushing means whose velocity is much in excess of that of the normal travel of the goods. In addition, strings 27 will further prevent any upward curving or distortion of the goods, especially as the advancing edge leaves the brushing means.

15 Clearing of the slots 90 by work advancing over table 12 sets again into operation the motor 60 which then rotates in the reverse direction and at the same time operates the solenoids to bring the smoothing and brushing means together for action on the trailing edge, said motor ceasing to rotate after a predetermined interval and the solenoid being de-energized so that said means will return to the separated position and be in condition for a repetition of the cycle when a further piece of work is put through the machine.

I claim:

1. In an ironing machine for flat work including feeding means and ironing rolls for the goods to be ironed: means intermediate the same adapted for temporary engagement therewith for smoothing and brushing the advancing and trailing edges of goods passing through the machine, said means including two sets of pairs of separable, juxtaposed and oppositely rotatable supporting members, one set being located in advance of the other in the path of travel of the goods, together with belts connecting the respective supporting members of one set with the corresponding members of the other set to communicate rotation from one to the other, the said belts bearing outwardly extending brushing elements, and means for imparting rotation to one set of the supporting members continuously during the period of engagement with the advancing edge of the goods and continuously in the opposite direction during engagement with the trailing edge thereof.

2. In an ironing machine for flat work including feeding means and ironing rolls for the goods to be ironed: means intermediate the same adapted for temporary engagement therewith for smoothing and brushing the advancing and trailing edges of goods passing through the machine, said means including two sets of pairs of separable, juxtaposed and oppositely rotatable supporting members, one set being located in advance of the other in the path of travel of the goods, together with belts connecting the respective supporting members of one set with the corresponding members of the other set to communicate rotation from one to the other, the said belts bearing outwardly extending brushing elements, means for imparting rotation to one set of the supporting members continuously during the period of engagement with the advancing edge of the goods and continuously in the opposite direction during engagement with the trailing edge thereof, and means to adjust the supporting members of one set toward and away from the supporting members of the other set.

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