CHAPTER VII

Flatwork Ironing Machinery

1. General remarks

After damp drying in the hydro extractor, the next stage in the laundry process is to achieve the finished drying and pressing of such work as demands this attention, namely, bed linen, table linen, handkerchiefs, and certain classes of body linen. This work is accomplished mechanically in a flatwork ironing machine also known as a calender ironer. Single roll ironing machines are also termed "Decoudun" ironers. The work is passed through the machine in the damp condition as received from the hydro extractor, and both starched and unstarched work can be processed. The machine has a double function:

(*a*) To dry the work completely, and, in so doing,
(*b*) impart a finished surface to the work being processed.

2. Types of machines

Numerous types and makes of machines are available, ranging from small single roll machines especially designed for handkerchief work, to machines having eight or more rolls each of 15 in. diameter by 160 in. long.

Single plain roll ironers, of sizes ranging from 72 in. by 18 in. diameter to 90 in. by 24 in. diameter, were at first installed in H.M. ships, and many of

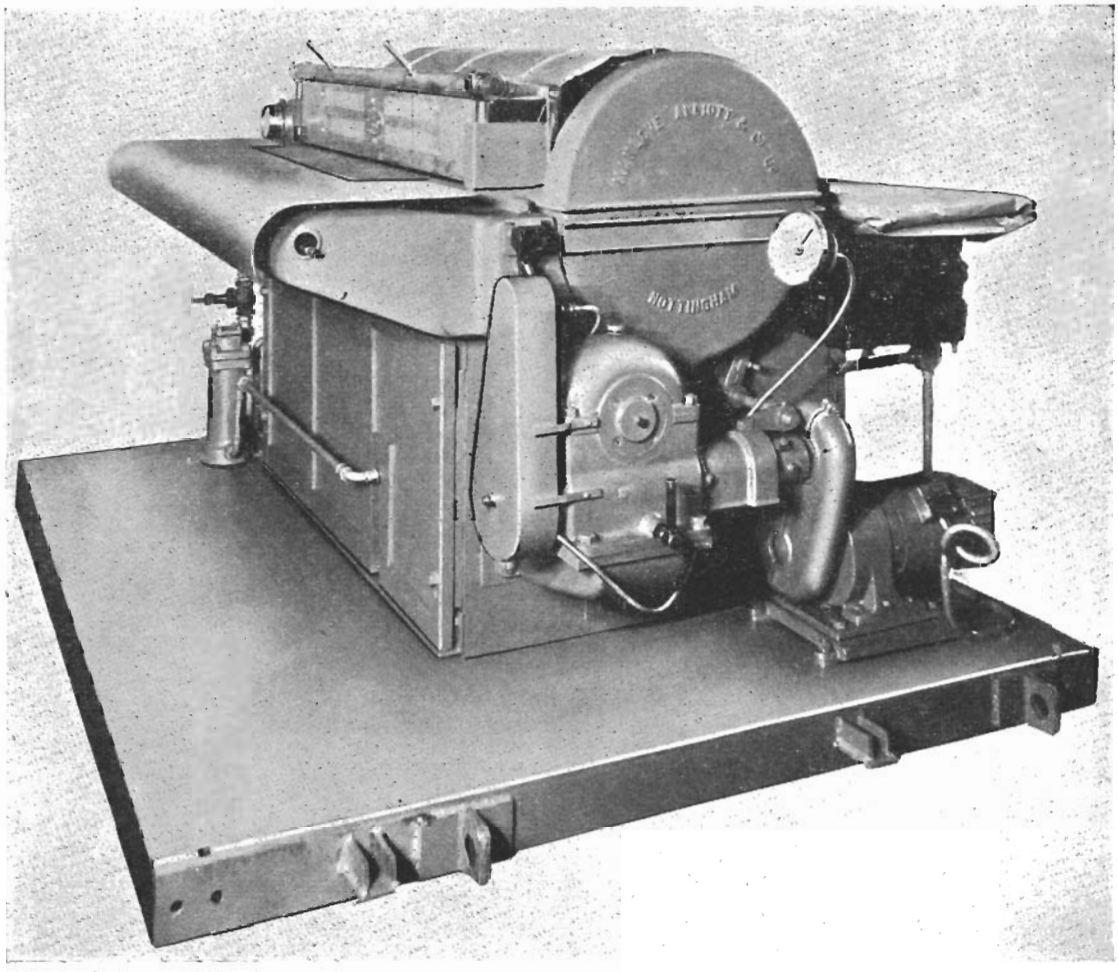

Fig. 47.—Arrangement of 36 × 24-in. Manlove flatwork ironing machine, driving end.

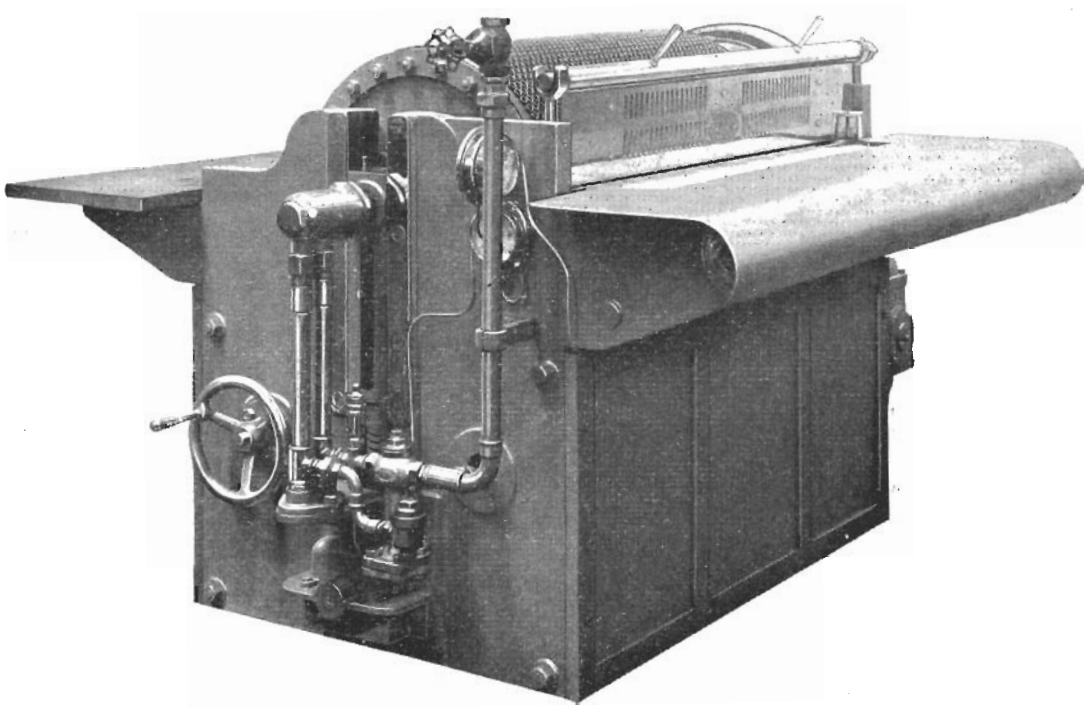

Fig. 48.—Arrangement of 36 × 24-in. flatwork ironing machine, showing spring roller.

these machines are still giving satisfactory service. Because the space occupied and the weight of such machines were out of proportion to their rate of output, more recent practice has been to install machines of 36 in. by 24 in. diameter of the ventilated roller type.

The majority of flatwork ironing machines at present installed are of the straight through type, *i.e.*, work fed in from the feed table passes under the roller to the delivery table on the opposite side of the machine.

With a view to further space conservation relative to increased output, a 56 in. by 25 in. diameter return feed type of machine has been developed for shipboard use. With this type of machine as the name suggests, work fed into the machine is returned back to the operator. The return feed machine has been given separate detailed treatment.

3. Conditions required for processing flatwork

In flatwork ironing, the ideal condition is reached when work can be completely dried and ironed in one transit through the machine. The length of the roller should be such that the largest items, say sheets, can be passed through in one thickness. Output is then dependent upon the speed at which work passes through the machine, bearing in mind that the work must be in contact with the heated surface of the bed for a sufficient time to effect thorough drying. High rate of production can be achieved by:

A single roll machine of large diameter revolving at a comparatively slow speed.

Double or multi-roll machines having smaller diameter rollers revolving at a higher speed.

In Fleet Shore Establishments where the necessity to conserve weight and space does not arise, the ideal condition is achieved by the installation of twin roll type machines having rollers of 120 in. by 24 in. diameter.

STRAIGHT-THROUGH FEED TYPES

4. Description

While, by reason of the variety of types and sizes available, the construction varies in detail, the flatwork ironing machine consists fundamentally of one or more padded—referred to as clothed—steam heated roller(s) suitably supported on end pedestals and capable of revolution in a deep-sectioned polished cast-iron steam-heated bed. The roller(s) are steam heated to a pressure of 10 lb./sq. in. and fitted with reducing and safety valves; the working steam pressure for the bed is 100 lb./sq. in.

5. Roller construction

PLAIN ROLL TYPE.—The moisture in the articles being processed vaporises and escapes freely into the atmosphere; a certain amount of moisture is, however, always present in the clothing of the roller.

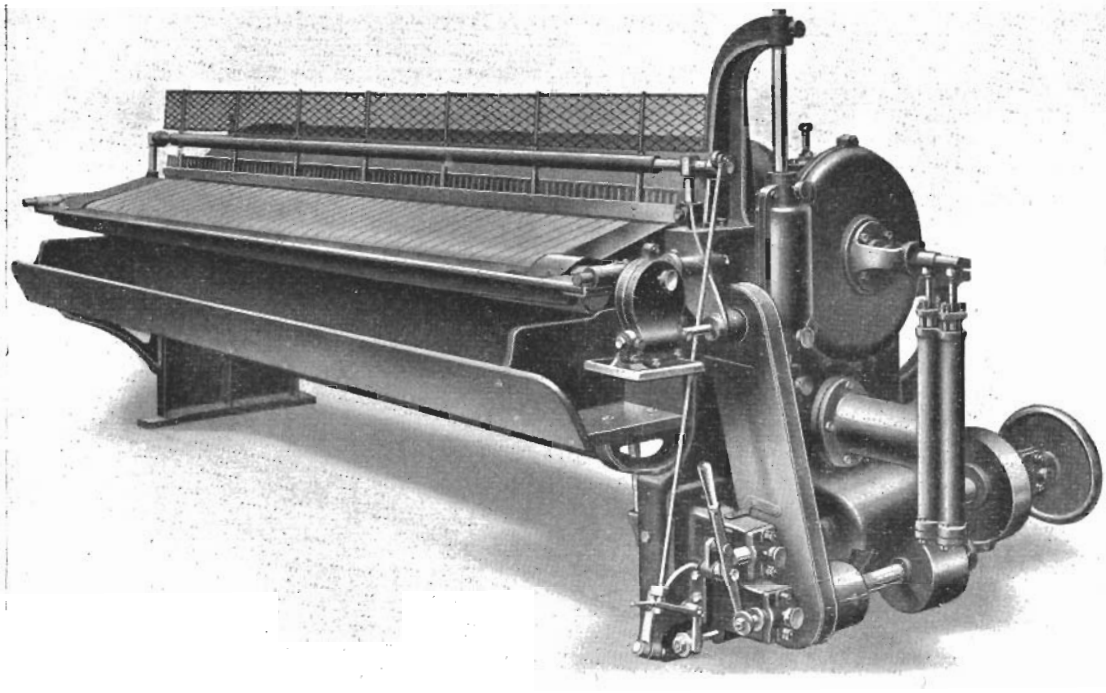

Fig. 49.—Arrangement of T. Bradford 90 × 24-in. single roll flatwork ironing machine.

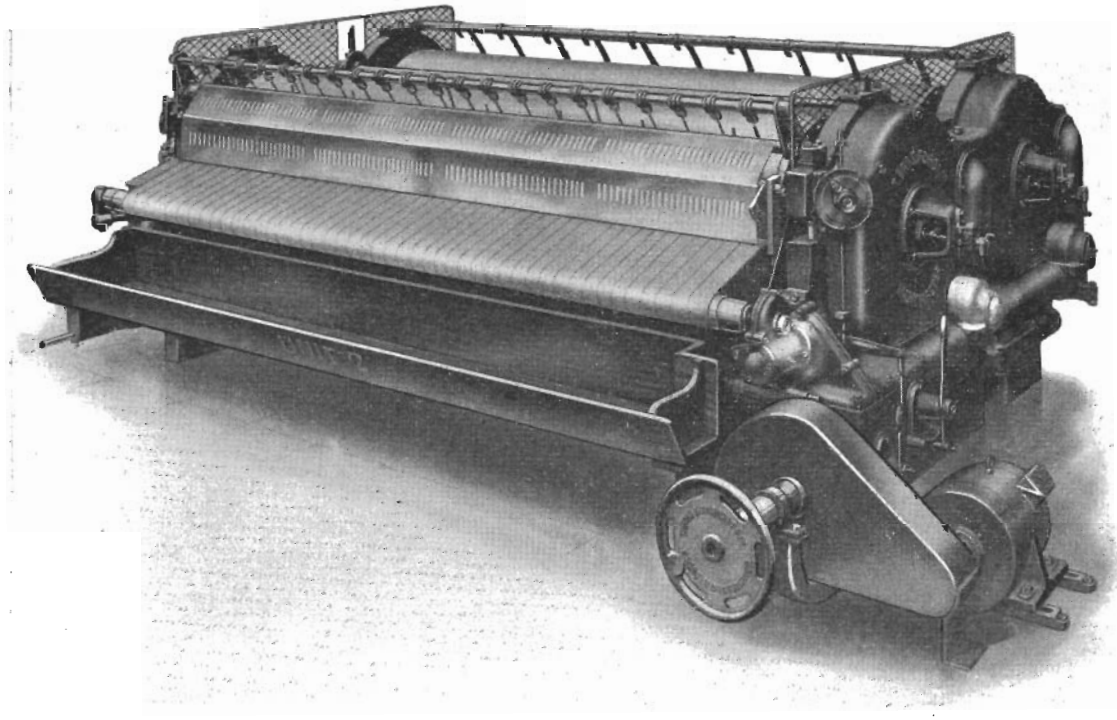

Fig. 50.—Arrangement of T. Bradford 120 × 24-in. double roll flatwork ironing machine.

VENTILATED TYPE.—An air gap is preserved between the actual surface of the roller and the clothing. The vapour generated from the work passes through the clothing, and is rapidly dispersed through vapour outlets at the ends of the roller.

Ventilated type rollers are now always specified for machines for Admiralty service. Typical examples are illustrated in Figs. 51, 52 and 53.

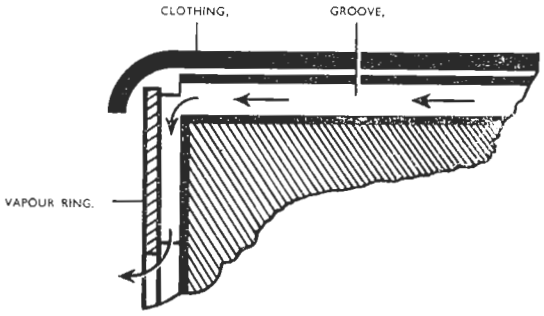

Fig. 51.—Section of ventilated roller for 36 × 24-in flatwork ironer.

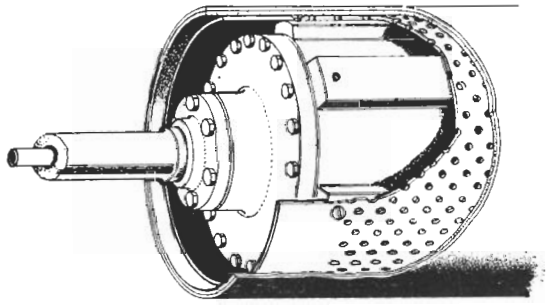

Fig. 52.—Section of ventilated roller for 90 × 24-in. flatwork ironer.

In some very large machines the vapour is drawn from the roller by means of a suction fan, but in all cases machines fitted with ventilated type rollers are, size for size, capable of a much higher ouput than the plain roll type.

FLEXIBLE TYPE.—Unless suitable provision is made, garments having buttons attached, or embossed embroidery, cannot be passed through the flatwork ironing machine without damage to the work. To enable this work to be processed, flexible type rollers are provided in some makes of machines, a typical example being illustrated in Fig. 54.

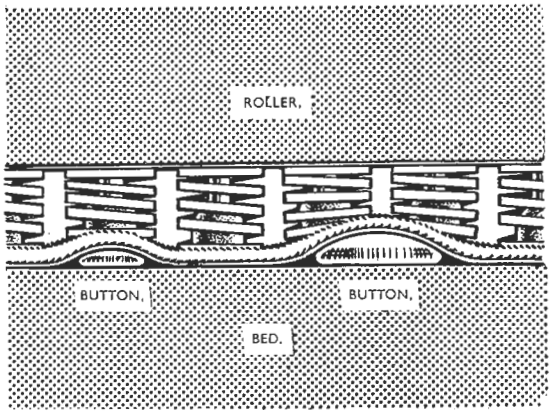

Fig. 54.—Spring padding for 36 × 24-in. flatwork ironer.

6. Pressure adjustment

Lifting gear of either the hand or power-operated type, according to the size of the machine, is provided to raise the roller clear of the bed. Hand-screw-type adjusting gear is provided, to vary within fine limits the pressure of the roller on the work. Some makers of multi-roll machines incorporate a feature whereby the pressure on all the rolls may be automatically increased or decreased simultaneously.

7. Drive

Drive to the machine is arranged by chain or vee belting from the motor through a clutch and thence through reduction gearing to the roller. A two or more speed gear box is fitted on some machines; in certain cases large variations in the speed range of the rollers are obtainable by electrical control.

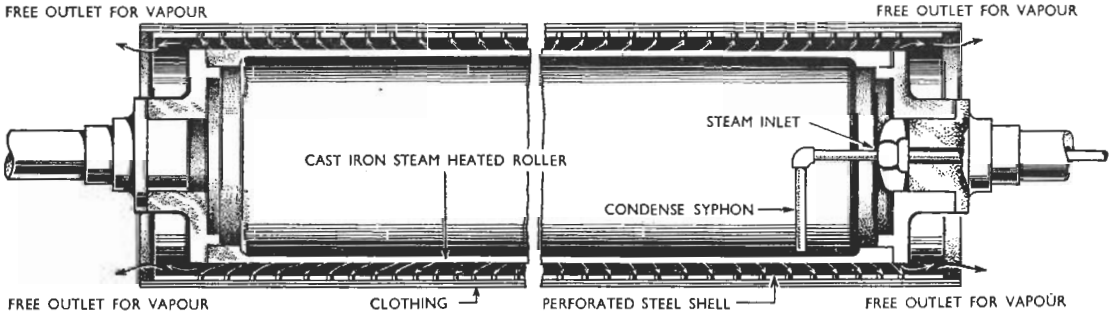

Fig. 53.—Full section of ventilated roller for 90 × 24-in. flatwork ironer.

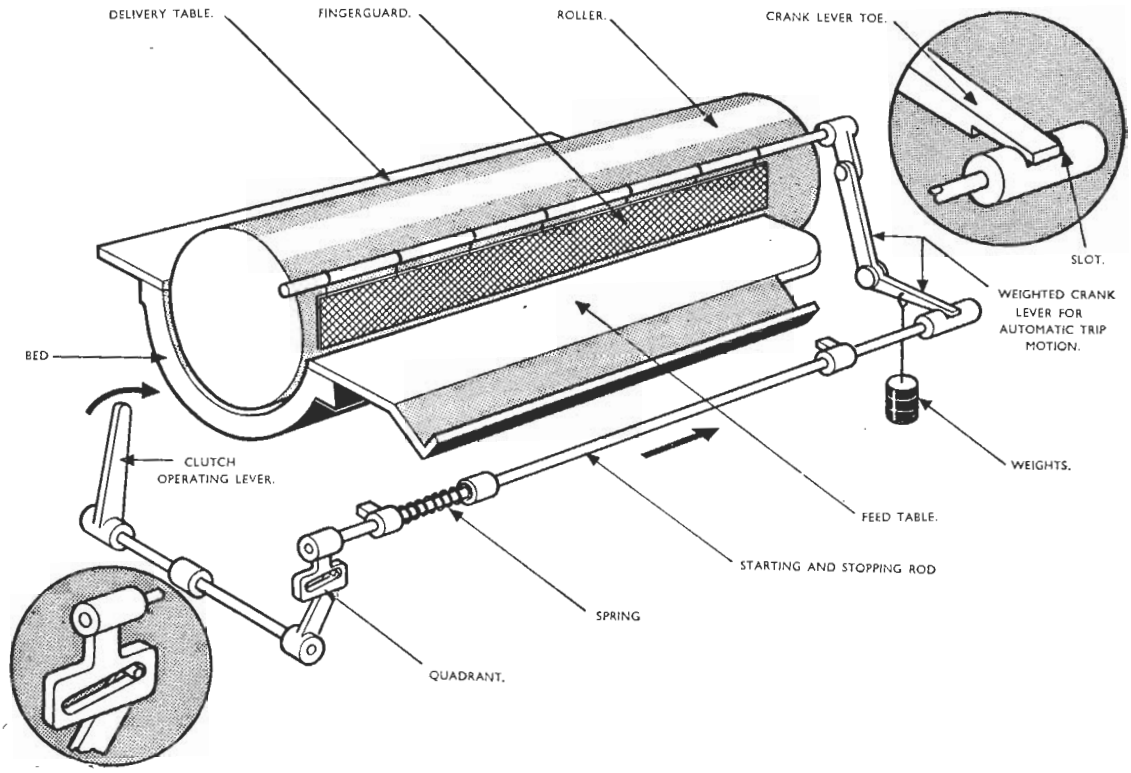

Fig. 55.—Fingerguard device for 90 × 18-in. flatwork ironing machine.

8. Stripping gear

Automatic stripping gear is provided on all large machines whereby the articles are delivered to the delivery table with minimum attention from the operator.

9. Safety devices

To ensure that the operator's fingers cannot be caught between the bed of the machine and the roller, all machines are equipped with a safety device worked in conjunction with the finger guard. Slight pressure on the finger guard results in the immediate stopping of the machine.

(*a*) TYPICAL SAFETY DEVICES.—A typical safety device is illustrated in Fig. 55.

The finger-guard is arranged along the whole length of the feed table, in front of the roller and at a height sufficient to allow passage of material only to the roller. The guard is connected by a system of levers through the stopping-and-starting rod to the clutch-operating lever which engages and disengages the machine-driving clutch. Under normal working conditions the clutch is engaged. The starting-and-stopping rod is spring loaded and retained in position by the engagement of the toe of the crank lever with a slot cut in the extension to the operating rod. Slight pressure on the finger guard, such as may result if the operator's fingers come into contact with the bottom edge of the guard, causes the guard to move. The movement is transferred to the toe piece on the crank lever which lifts thus allowing the spring to move the starting rod in the direction shown. The longitudinal motion of the rod is conveyed through a quadrant to the clutch-operating lever, causing the instant disengagement of the clutch and the immediate stopping of the roller.

(*b*) A diagrammatic arrangement of the finger guard safety device fitted on the 36 in. × 30 in. Manlove flatwork ironing machine is illustrated in Fig. 56.

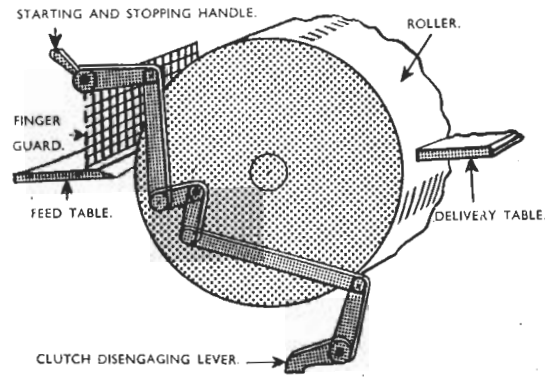

Fig. 56.—Fingerguard device for 36 × 24-in. flatwork ironing machine.

Contact with the finger guard is conveyed by a simple lever system to the clutch disengaging lever and results in the immediate stopping of the machine.

(*e*) SETTING THE FINGER-GUARD

The bottom of the finger-guard on all machines is arranged at a height of $\frac{3}{8}$ in. above the feed table, and should be maintained at this level at all times. Adjustment of the finger-guard safety device should be such that:

(*a*) the guard reacts to the slightest finger pressure

(*b*) resultant upon the movement of the finger guard, the machine will stop within the period taken for the material to travel the horizontal distance between the bottom of the guard and the lip of the bed.

10. Operation

(1) The roller must always be raised clear of the bed when the machine is idle, and must not be lowered prior to working, until the bed and roller are thoroughly warmed through.

(2) The bed and roller must be allowed to warm through for about 30 minutes before the machine is required for use. During the warming through period, the air cocks on the bed, where fitted, should be opened for a few minutes to release all air from the bed.

(3) The steam traps from the bed and roller should be thoroughly blown through.

(4) Lower the roller on to the bed of the machine.

(5) When using the machine for the first time each day, test the finger guard to ensure that the safety arrangements are working efficiently.

(6) Use all the surface of the roller. Constant feeding of small articles or thick materials in one place causes uneven wear on the padding necessitating more frequent renewal of the roller clothing than would normally be necessary.

(7) The variation of the pressure for different quality work can be obtained by means of the hand adjusting gear on the roller.

(8) On closing down for the day, or for any period during which the machine can be expected to remain idle for 15 minutes or more, the roller must be lifted clear of the bed to prevent the padding being scorched. Before raising the rollers, however, the machine should be allowed to run idle for approximately 5 minutes to allow the clothing to dry.

(9) All coverings should be loosened on the roller at week-ends, as the padding tends to recover resiliency if in contact with air.

11. Cleaning the bed

The bed of the machine must be kept free from accumulation of lint and dirt at all times. It is of polished cast iron, and harsh abrasive substances must not be used to clean it or the surface will be quickly destroyed. Powdered lime, or chalk on a damp cloth, is recommended, and cleaning should be done by moving the arm across the radius of the bed and not lengthwise. After cleaning, polish with a dry cloth.

One of the main sources of trouble is the accumulation of starch on the lip and bed of the machine, causing the work to stick and the edges to be turned back. Undue deposits can usually be attributed either to the incorrect preparation of starch or to the bed of the machine being too cold. (These conditions will not arise if the correct operating instructions are adhered to). Small deposits of starch will always tend to be present, but can be removed by cleaning the bed daily with a cloth treated with paraffin wax.

Use a piece of sheeting of the same length as the roller and about 3 ft. wide. Apply the paraffin wax to one half of the width of the sheet only and along its whole length. One side only of the sheet should be waxed (see Fig. 57).

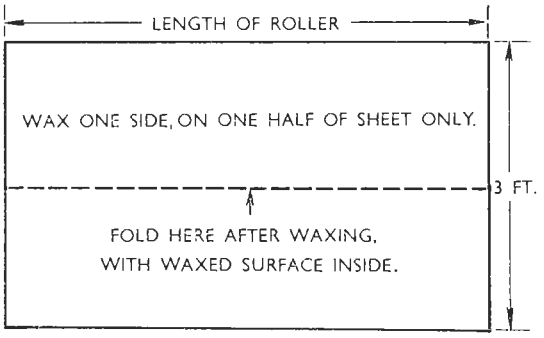

Fig. 57.—Method of waxing a sheet for cleaning the machine bed.

Fold the sheet with the unwaxed side outward and pass twice through the ironing machine with the folded edge first. The sheet should be retained for daily use until the wax content is exhausted.

12. Roller clothing materials

(*a*) The types and grades of clothing recommended by individual makers of flatwork ironing machines are too numerous to justify stocks of each being carried. The undermentioned materials are however generally suitable for reclothing the rollers of all types of ironing machines. *See also* asbestos clothing.

$\frac{1}{16}$ in. asbestos cloth
Knitted cotton padding
Egyptian cotton sheeting (top clothing).
The top sheet requires washing once weekly.

The knitted cotton padding compresses during use, thus gradually reducing the diameter of the roller, and under normal working conditions requires replacement or increasing at three monthly intervals.

The asbestos cloth should last for a considerable period but should be examined on each occasion when replacing the knitted cotton padding.

13. Reclothing the rollers

PRELIMINARIES

(1) Raise the roller as high as possible above the bed of the machine.

(2) Preheat the bed and the roller.

(3) Carefully remove the old clothing from the roller.

(4) Clean the polished bed.

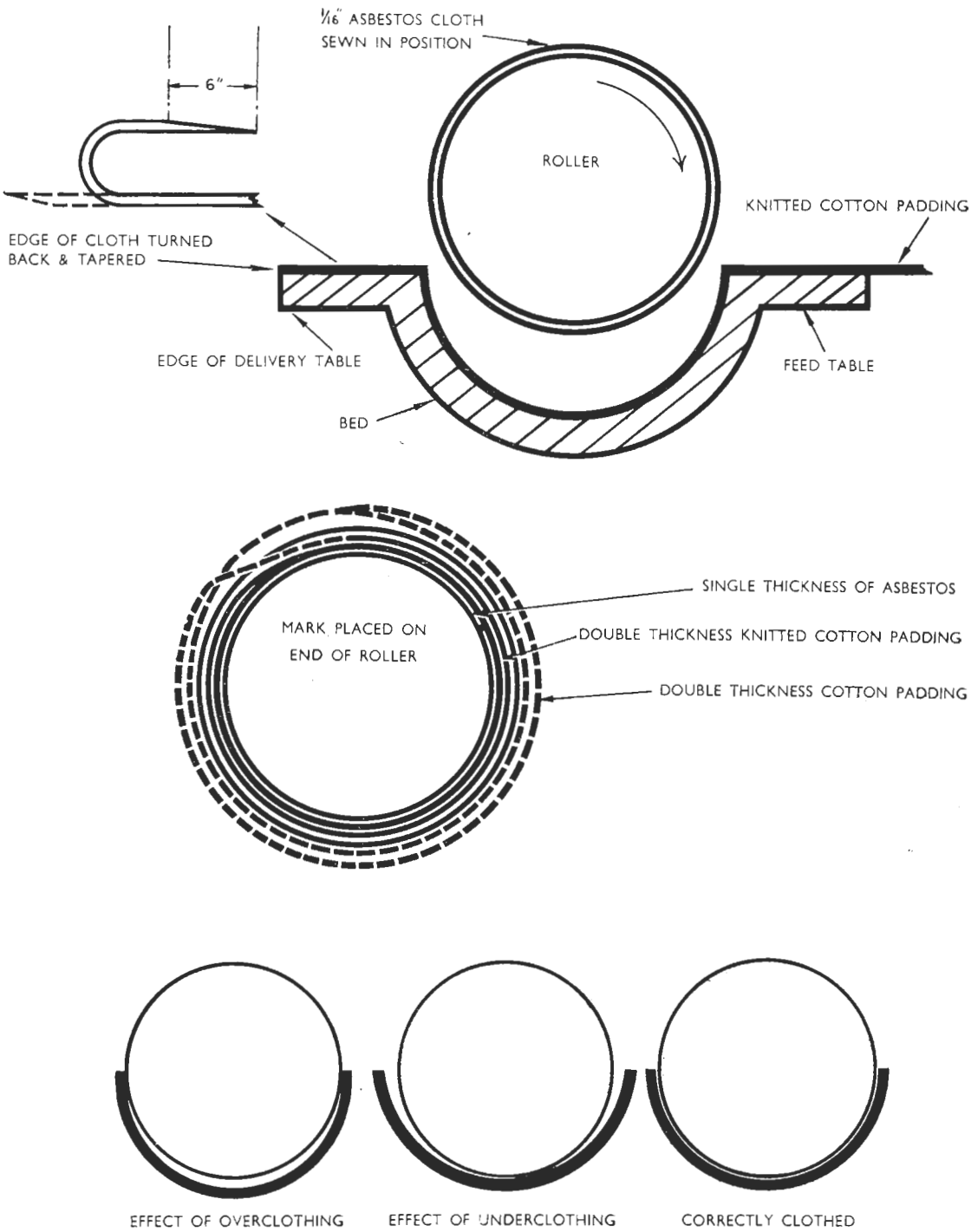

Fig. 58.—Typical method for reclothing the roller.

ASBESTOS CLOTH

(5) Cut to the length of the roller plus 4 in. and width equal to the exact circumference of the roller. All edges should be kept perfectly straight and square.

(6) Stretch the cloth firmly around the roller with a 2 in. overlap each end, and sew the edges together, taking care that no overlap occurs.

KNITTED COTTON PADDING

(7) Cut to the length of the roller plus 4 in. by twice the circumference of the roller plus 9 in.

(8) Allowing 2 in. overlap at each end of the roller, insert the padding squarely through the machine from the feed side. Trim the edge of the cloth using the edge of the delivery table as a guide.

(9) Turn back the leading edge of the padding and, with a steel comb, taper the edge of the cloth for a width of 6 in. along its whole length.

(10) Turn back the combed edge to the original position and lower the roller into the bed, making sure that the padding is not creased or folded under the roller.

(11) Bring the padding over the roller from the delivery side and place a chalk mark at the point of contact at each end of the roller.

(12) Start the machine and feed in the padding; allow the machine to run for 10 minutes, thus permitting the padding to bed down.

(13) Stop the machine when the chalk marks denoting the inner edge of the cloth are 6 ins. above the delivery edge of the bed.

(14) Turn back the padding and taper the edge along its whole length.

(15) Allow the machine to revolve 2 or 3 times to bed-in the tapered edge.

TOP SHEETING

(*Note.*—The sheeting should be thoroughly washed and carefully ironed before use, and a spare top sheet should therefore always be ready for immediate use.)

(16) Cut to length of roller plus 4 in. by twice the circumference of the padded roller.

(17) Stop the machine and throw back the last 18 in. of the padding. Place the sheeting on the roller and return the padding to its previous position. The padding will now lap over the first 18 in. of sheeting. Start the machine and feed the sheeting on to the roller maintaining a slight and even tension on the sheet.

Notes

(i) A steel tape or a caliper type gauge is normally provided with each machine, the length of which is equal to the correct final padded circumference of the roller.

(ii) Complete turns of material should always be used to preserve a true circular shape.

(iii) The clothing for the machine is expensive, and economy in use should be exercised. As the padding compresses it may be possible to make up the diameter of the roller by the addition of one round of calender sheeting or previously used knitted cotton padding.

14. Tests after reclothing

It is important that the roller be neither under nor over-clothed, and after reclothing the following tests should be applied:

(*a*) Start the machine and feed in a piece of tape. If this can be pulled out after going in a few inches the roller is underclothed. In this condition the roller is resting on the bottom of the bed and off the sides. The tape should be fed in at each end and in the centre to test the alignment of the roller.

(*b*) After adding more clothing, re-test in the same manner.

(*c*) Overclothing will be denoted by excessive pressure on the feed and delivery edges of the machine, and clearance between the bottom of the roller and the bed. The latter can be tested with a thin steel rule.

(*d*) The correct amount of clothing can best be determined from experience. New clothing compresses slightly, and a small degree of overclothing may correct itself after a few hours' running.

15. Double roll machines

When clothing double roll machines the back roller should be covered first.

16. General maintenance

(*a*) For maximum efficiency the steam supply to the bed and roller must be maintained constantly at the working pressures for which they are designed. The steam pressures normally adopted by makers are 100 lb. per sq. in., and 10 lb. per sq. in., for the bed and roller respectively.

(*b*) The steam traps, safety valves and safety fingerguard device should be maintained constantly in an efficient condition.

(*c*) All bearings should be kept clean and lubricated regularly, particular attention being directed to the trunnions, lifting screws, link gear of the safety fingerguard device, and to the maintenance of the correct level of oil in the gearbox.

RETURN FEED TYPE

17. General remarks

The return feed type ironing machine has been developed with a view to conservation of space, which is of major importance in shipboard laundries. The fundamental difference between this machine and the types previously described is that work is entirely handled from the front of the machine. Articles are fed into the machine at the top of the roller and delivered from the bottom. Work troughs are provided at the top (feed) and bottom (delivery) positions.

18. Description

The machine, Fig. 59, is largely of fabricated construction, the steel main frame and end pedestals being designed to support the bed, roller and driving mechanism. The steel roller, 25 ins. diameter by 56 ins. long, is of the ventilated type, and is provided with a flexible covering. The bed opening is arranged

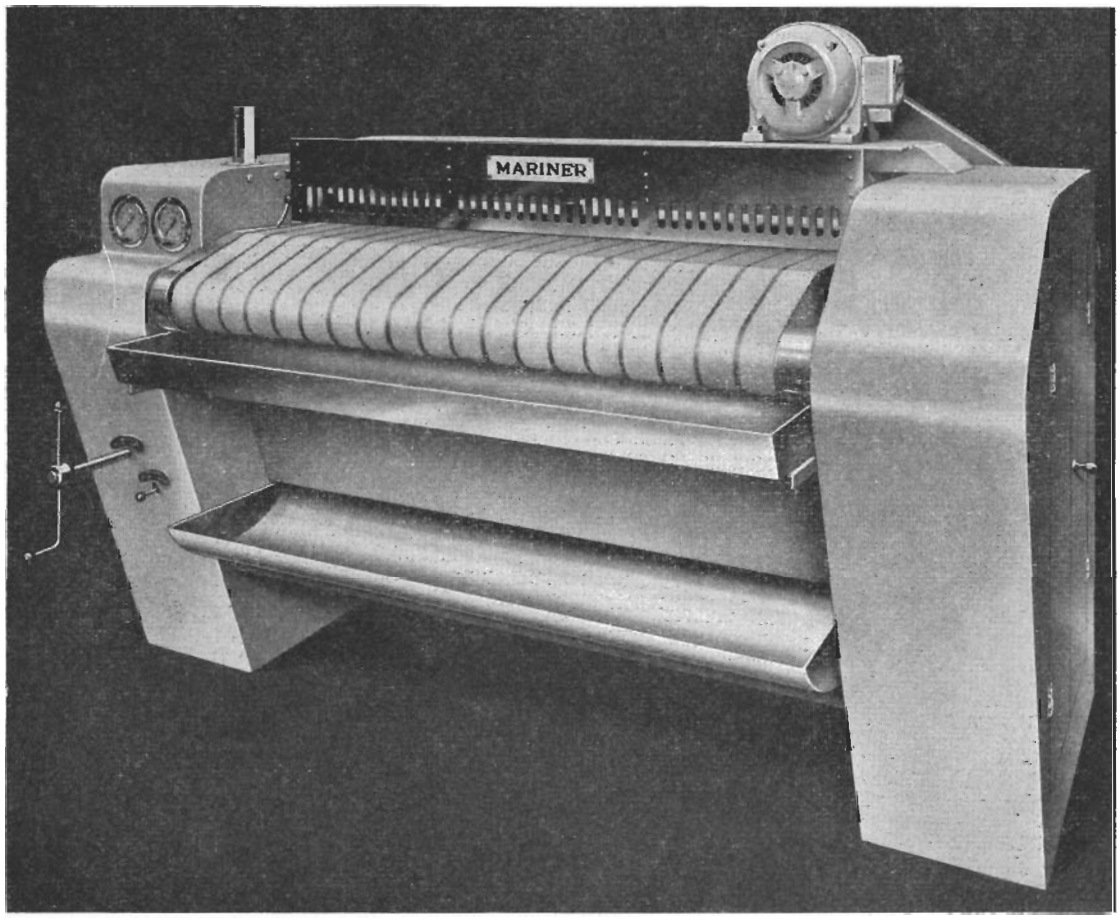

Fig. 59.—Arrangement of T. Bradford 56 × 25-in. return feed flatwork ironing machine.

in the vertical plane, *i.e.*, the ironing bed is vertically mounted in the main frame. The working steam pressure of the roller is 10 lb. per sq. in., and that of the bed 100 lb. per sq. in. Separate steam traps, fitted with strainers and by-pass arrangements, are provided for the condensate from the bed and the roller; the latter is also automatically air vented. Pressure gauges for registering the steam pressures in the bed and the roller are mounted in the front casing of the machine.

The motor is fixed to the top casing of the machine, the drive to the main driving-shaft pulley being through vee belting. Power is transferred through a clutch to a worm, which engages with the main wormwheel mounted on the roller trunnion, Fig. 60. The clutch is disengaged immediately the safety finger-guard is operated.

The roller trunnion-bearing housings, see Fig. 61, are mounted on a slide. Provision is made for moving the roller into or away from the bed, for cleaning and re-clothing and to obtain the required variations of pressure between the bed and the roller for different classes of work. The roller is moved by means of a handwheel, situated at the front left-hand pedestal of the machine, which operates the square-thread pressure and traversing screws through chain reduction-gearing. The chain gearing enables simultaneous movement to be obtained at both ends of the roller. The pressure screws are connected by a wire cable to a pressure indicator, which registers the amount of spring pressure between the roller and the bed. Separate provision for independent hand adjustment to the roller is arranged at the non-gear end of the machine.

19. Ventilated roller with flexible covering

The roller, Fig. 62, is of the built-up drum type. A wire mattress A is fitted over the whole surface of the roller, and is secured at the joint by spiral wire lacing. Driving studs are used to locate the mattress and to prevent it creeping on the roller. The wire mattress serves as a base for the roller coverings D which comprise :

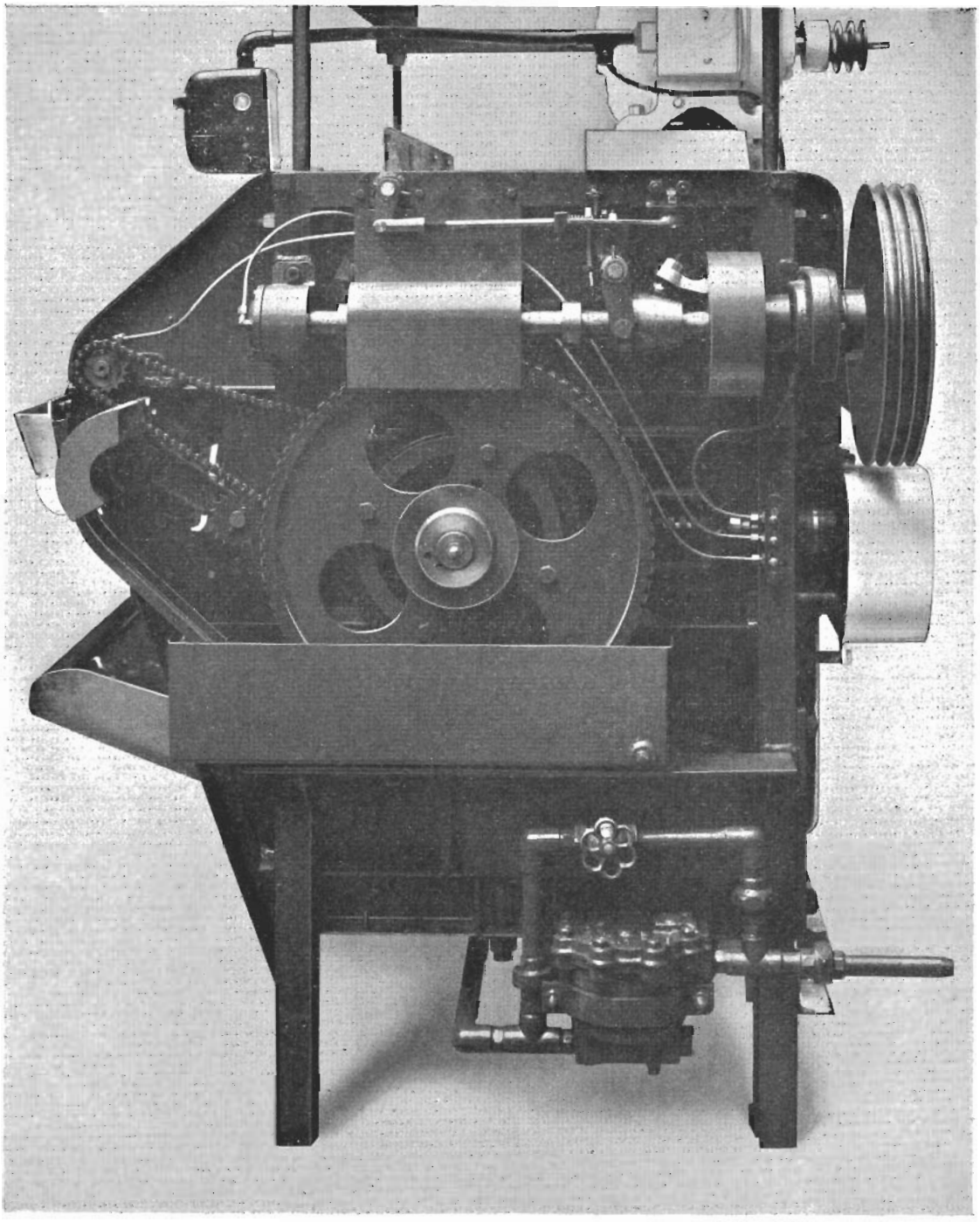

Fig. 60.—Arrangement of gear drive for 56 × 25-in. return feed flatwork ironing machine.

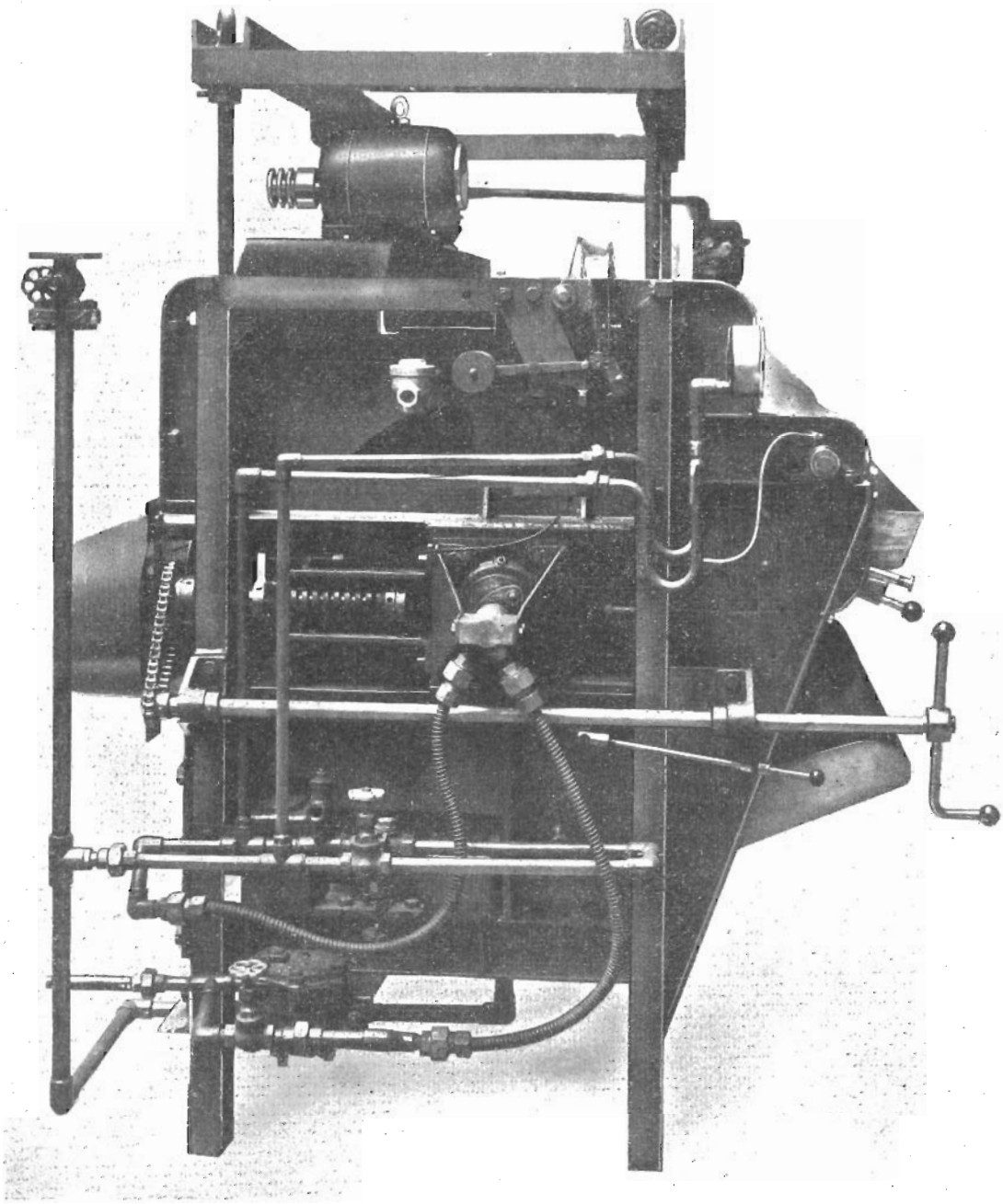

Fig. 61.—Arrangement of non-gear end for 56 × 25-in. return feed flatwork ironing machine.

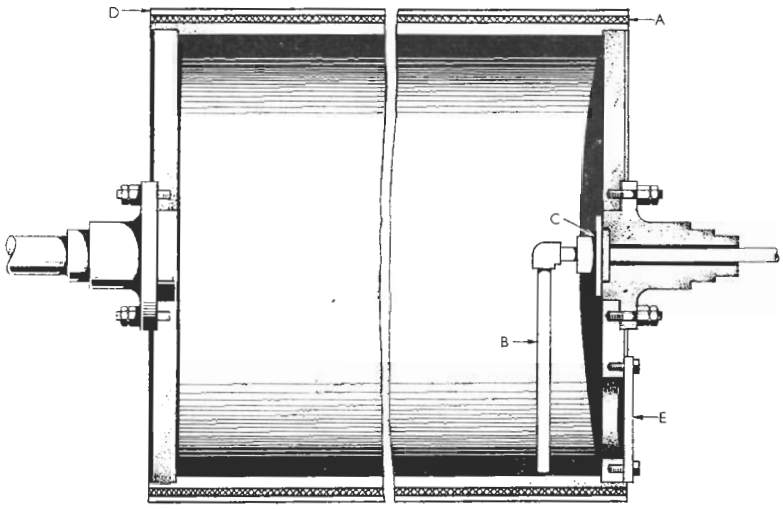

Fig. 62.—Ventilated roller for 56 × 25-in. return feed flatwork ironing machine.

2 wraps of Burlap (*i.e.*, coarse canvas)—56 in. by 158 in.

2 wraps of $\frac{1}{4}$ in. thick knitted padding—56 in. by 158 in.

1 $\frac{1}{2}$ wraps of thin binder sheeting—56 in. by 118 in.

1 $\frac{1}{2}$ wraps of thick sheeting—56 in. by 118 in.

The flexibility of the roller is obtained by the use of the knitted padding, which imparts a cushioning effect to the roller coverings, enabling buttons, etc., to be passed through the machine without damage to them.

Re-covering may be effected by the use of the alternative materials:

2 wraps of $\frac{1}{16}$ in. asbestos—56 in. by 158 in.

2 wraps of $\frac{1}{4}$ in. knitted padding—56 in. by 158 in.

3 wraps of Egyptian cotton sheeting—56 in. by 236 in.

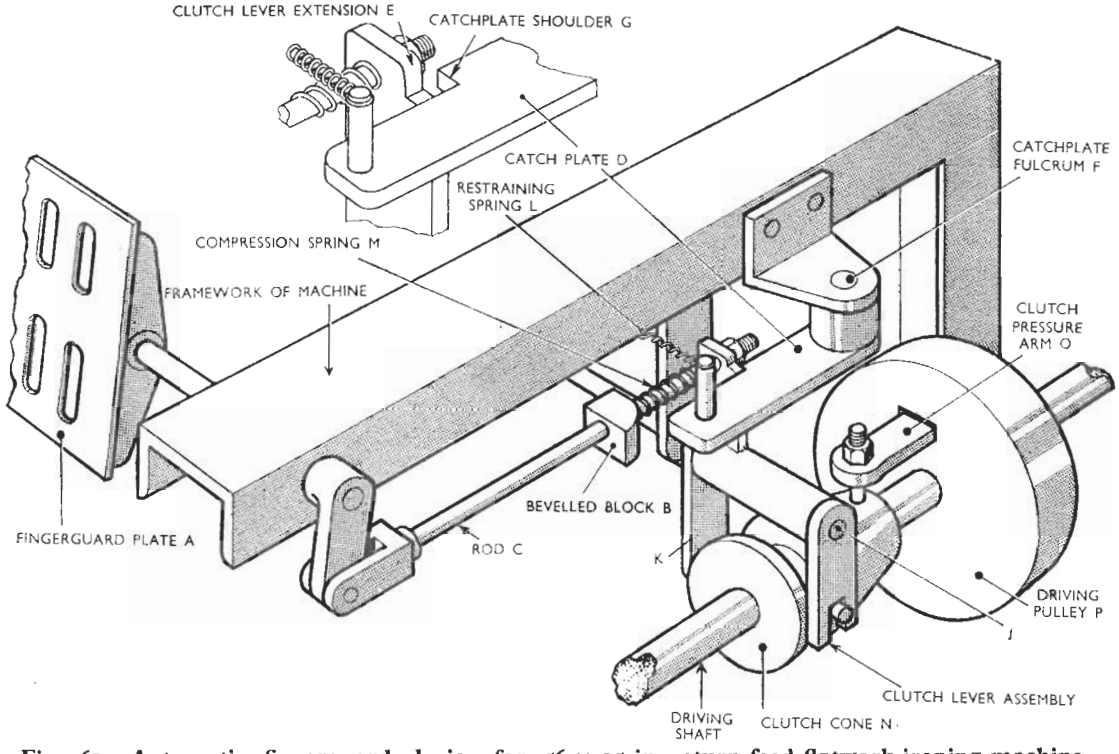

Fig. 63.—Automatic fingerguard device for 56 × 25-in. return feed flatwork ironing machine.

Steam is admitted to the roller at the non-gear end through the trunnion at C, and the condensate is syphoned away through the pipe B. An inspection plate E is provided for maintenance purposes. Ventilation of the roller is arranged as follows: Moisture is freely extracted from the work being ironed, and passes through the clothing to the annular space formed by the wire mattress between the roller coverings and the roller drum.

The free vapour is emitted at both ends of the roller.

20. Automatic finger guard (*Fig.* 63)

Motion of the finger-guard plate A when pushed towards the machine is transmitted to the bevelled block B which is fixed to the rod C. The bevelled face of B causes the catch plate D to swing about its fulcrum F against the tension of the catch plate restraining spring L until the catch plate shoulder G is clear of the extension E on the clutch lever EJK.

When the catch plate is cleared, the compression spring M is released immediately and the clutch lever pivots about its axis JK, so withdrawing the clutch cone N from the clutch pressure-arm O, thus allowing the driving-pulley P to revolve freely without driving the machine.

The guard is re-set by pulling the finger guard plate A forward; movement of the rod C is communicated to the clutch lever EJK, the vertical member (KE) of which travels along the face of the catch plate D, against the pressure of the spring M. The catch plate D is constrained to return to its original position by the tension of the spring L.

The clutch lever slides along the face of the catch plate until the clutch lever extension E drops into position in front of the catch plate shoulder G. The finger-guard is then in the set safety position and clutch cone N engaged for driving.

21. Re-clothing the roller

(1) Withdraw the roller to its maximum position clear of the bed, with the stripping fingers of the " riband feed " in the cleaning position.

(2) Shut off the steam supply to the bed and roller and allow the machine to cool. (If re-clothing is commencing after a period of idleness of the machine, the roller should already have been partially withdrawn from the bed and steam supplies shut off in accordance with standing instructions.)

(3) Remove the feeding trough from the front of the machine.

(4) Remove the worn out clothing.

(5) Before commencing to re-cover the roller it is imperative that the surface of the bed is perfectly clean. With the roller 1 in. clear of the bed and with the stripping fingers of the riband feed still in the cleaning position, feed a clean cloth between the rotating roller and the ironing surface of the bed. *Important.*—See also separate description para. 23 (*b*) " access to the bed for cleaning."

(6) Pre-heat the bed of the machine. This is accomplished more quickly by first by-passing the steam trap. As the bed warms up, the by-pass valve should be closed, thus allowing the condensate to pass through the strainer and trap.

(7) Adjust the roller until the wire mattress is $\frac{1}{2}$ in. clear of the bed surface; covering may now commence.

(8) Place the burlap across the front of the roller, below the riband feed table, and stitch the leading edge to the wire mattress with strong twine. Rotate the roller until the whole length of burlap (158 in.) is wrapped on the roller, excepting a length of 28 in. which is to remain for overlapping the knitted padding.

(9) Place the $\frac{1}{4}$ in. thick knitted padding under the burlap, *i.e.*, having 28 in. of burlap overlapping, care being taken to ensure that the knitted padding is kept square and parallel across the face of the roller. Rotate the roller until the leading edge of the knitted padding is in the centre of the bed. Now traverse the roller until the covering just contacts the surface of the bed, and apply two wraps. Ensure that all creases are removed from the knitted padding during this process.

Allow the roller to rotate in the bed with the knitted padding in light contact with the bed surface until the clothing is thoroughly bedded on the roller.

(10) Check the overlap of the knitted padding in relation to the leading edge and after allowing 2-in. overlap, cut away all surplus material.

(11) Lap the thin binder-sheeting 28 in. under the knitted padding and apply the $1\frac{1}{2}$ turns, taking care that the leading edge is square with the roller and that all creases are removed as the covering is applied.

(12) Allow the covered roller to rotate in the bed for a period, and then apply $\frac{1}{4}$ in. of spring pressure.

(13) Replace the feed trough, and return the stripping finger section of the riband feed to the normal working position.

(14) Heat the roller, first by-passing the steam trap. When the roller is warm, close the by-pass.

(15) The machine should now be used for a period of ironing thin articles only, and when the covering has bedded down the spring pressure increased to $\frac{1}{2}$ in.

(16) Check the circumference of the roller with the measuring tape provided. The outer thick sheeting must not be added until the covering is reduced to gauge size, *i.e.*, $78\frac{1}{2}$ in.

(17) When the correct gauge is reached, reduce the spring adjustment to $\frac{1}{4}$ in. and apply the final covering as follows: Lap the thick sheeting 28 in. under the thin binder sheet and apply the $1\frac{1}{2}$ turns. After covering, increase the spring adjustment to $\frac{1}{2}$ in.

The machine may now be used for normal work.

22. Operation

To prevent the scorching of the coverings, the roller must always be traversed clear of the bed when the machine is not in use.

The roller diameter should be frequently checked, and should it be found that the clothing is not parallel along its length, the necessary adjustment should be

made by means of the independent hand adjustment roller pressure nut, at the non-gear end of the machine.

The bed and roller must be thoroughly warmed through before the machine is brought into use. When starting up from cold, the steam traps on both the bed and roller should be by-passed to clear the condensate. As the machine warms up, the by-pass valves should be closed.

When the machine is thoroughly warm, the roller should be traversed into the bed by means of the hand wheel provided at the non-gear end of the machine.

When the roller contacts the ironing surface of the bed, further movement of the hand wheel applies spring pressure simultaneously to each end of the roller.

The spring pressure adjustment used for body linen should not be greater than ½ in. and that for flatwork, a maximum of 1 in.

The machine should be operated with the stripping gear in use and articles must not be allowed to accumulate in the delivery tray.

Use all the surface of the roller; constant feeding of small articles or thick materials in one place causes uneven wear on the padding.

Before closing down for the day, run the machine idle for a period of about 5 minutes with light surface contact between the bed and the roller, to allow the clothing to dry.

Before using the machine for the first time each day, test the finger guard to ensure that safety arrangements are working satisfactorily.

23. Adjustments

(*a*) RIBAND FEED.—The tension of the riband feed bands is maintained by a control lever at the non-gear end of the riband feed roller. If the bands stretch beyond the adjustment provided, remove the inserts in each band and re-adjust the tensioning gear accordingly.

(*b*) ACCESS TO THE BED FOR CLEANING.—The finger-guard is arranged to swivel from the vertical to the horizontal position by withdrawing the plunger at the gear end. This gives access to the bed for cleaning. When the guard is so positioned, an automatic stop makes it impossible for the driving clutch to be engaged, and the machine cannot be started until the guard is returned to the safety position.

In addition, the stripping finger section of the riband feed-table can be withdrawn by the lever at the non-gear end of the machine, to give increased clearance between the stripping fingers and the front of the bed.

The roller must be traversed to its maximum position from the bed prior to cleaning.

24. General

MAINTENANCE

For maximum efficiency the steam supply to the bed and roller must be maintained constantly at the working pressures for which they are designed, namely, 100 lb. per sq. in. for the bed and 10 lb. per sq. in. for the roller.

Steam traps, fittings and safety finger-guard devices should be maintained constantly in an efficient condition.

Lubrication of all parts should be applied in small quantities but at frequent intervals as follows:

TRUNNION BEARINGS.—These are arranged for forced feed (grease gun) lubrication and require high melting point grease.

WORM SHAFT BEARINGS AND RIBAND FEED ROLLER BEARINGS.—These are arranged for grease lubrication from battery mounted lubricators at the gear and non-gear side frames.

The following points require oil lubrication:

ROLLER HOUSING SLIDES.—Oil holes are provided in the top of the slides over the bearings, also at the front of each housing.

PRESSURE SCREWS AND ROLLER TRAVERSING GEAR, *including sprocket wheels*.—Bearings and hand wheel shaft bearings are provided with oil holes.

FINGER-GUARD AND CLUTCH.—All pins operating the clutch from the finger-guard, clutch lever, dogs and sliding cone should be lubricated.

STRIPPER GEAR SPINDLE.—Oil holes are provided in each bearing.

FINGER GUARD SPINDLE.—Oil holes are provided in the guards over the spindle bearings.

WORM DRIVE.—The oil well should be sufficiently filled to submerge the teeth of the worm wheel to a depth of ½ in. when the gear is at rest. This makes provision for lubricating the chain drive and tensioning gear to the riband feed roller when the machine is in motion.

STEAMWAY GLAND.—At the non-gear end of the roller should be lubricated daily.

25. Preparation of work

(*a*) All items to be finished in the flatwork ironer require preparation to enable the work to be fed easily into the machine and to help to maintain a continuous output.

(*b*) On removal from the hydro-extractor, all items should be " shaken out."

(*c*) After shaking out, small articles should be made up into conveniently sized bundles and placed on the preparing table in the front on the machine. Articles should be laid with the wrong side up.

(*d*) Large items such as sheets and tablecloths should be folded concertina fashion throughout their whole length into folds of about 12 ins., and built up into piles of 10 articles.

(*e*) The length of the machines installed in H.M. ships will not normally permit large items being passed through the machine lengthwise. Such items should be folded in two prior to folding in concertina fashion.

(*f*) With reference to (*e*), as the article is of double thickness it will not be completely dried after one pass through the machine, and a second pass will be necessary. See also the remarks on part drying, Chapter VI, para. 14.

(*g*) All articles should be fed perfectly straight into the machine.

26. Processing

Methods to be used for folding large items such as tablecloths and sheets, following ironing, are indicated in Fig. 64.

In all cases care should be taken to ensure that the laundry number is visible when the article is folded.

ASBESTOS CLOTHING

(see also Table No. IX)

27. As stated in para. 12 (*a*) asbestos clothing is now in wide use in commercial laundries. The basic details for reclothing such machines with asbestos are as follows:

(*a*) Three, and for certain makes of machines four, complete turns of coarse asbestos (K15 or equivalent) are applied next to the roller.

(*b*) Two complete turns of fine asbestos (K203 or equivalent) are then applied followed by

(*c*) Two complete rounds of cotton sheeting.

(*d*) When the clothing is thoroughly bedded in and wear-down takes place, the two rounds of clothing referred to at (*b*) above are removed and three rounds of fine asbestos substituted. Trials have shown that the machines can be run for in some cases 6 months before reboistering of the diameter of the roller is necessary.

(*e*) The normal expected life of such clothing is:

Top sheeting, 300 working hours
Fine asbestos, 12 months minimum
Coarse asbestos, 3 years minimum.

28. 120 in. × 24 in. Double-roll ironing machine

Initial Clothing with Asbestos

(*a*) GENERAL PROCEDURE

(1) Raise the rollers as high as possible above the bed of the machine.

(2) Carefully remove the old clothing from the roller.

(3) Preheat the rollers and bed.

(4) Clean the rollers before cleaning the bed.

(5) Clean and wax the bed.

(*b*) FRONT ROLLER

(1) Lay the coarse clothing on the roller; ensure that the leading edge is parallel with the lip of the bed.

(2) Secure the clothing around the roller nuts at each end to prevent slipping back. In the case of fluted rollers, the clothing can also be wedged in one or two flutes as an additional measure.

In the case of smooth rolls of the perforated type, the cloth should be anchored to the rolls by means of small wooden pegs spaced at 12 in. intervals, and driven into the perforations about 3 in. from the edge of the cloth.

In the case of smooth rolls without perforations, the cloth should be anchored to the roll by a heat-resisting cement, *e.g.*, "Trojan."

(3) Damp the leading edge of the asbestos cloth to prevent it turning back.

(4) Start the machine and feed on the clothing until the whole length of cloth is wrapped around the roller. To ensure a smooth roller surface, constant smoothing should be done during the "feeding on."

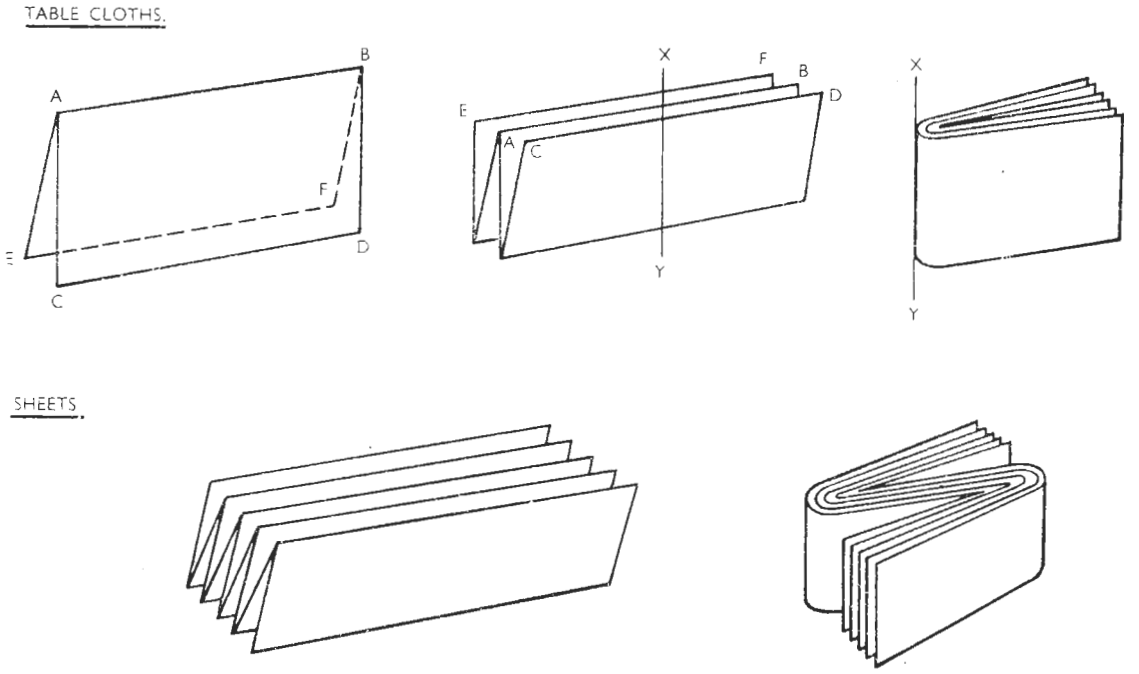

Fig. 64.—Method of folding flatwork.

(5) Cut back the asbestos to exactly three turns on the roller. In cutting back, follow the weft.

(6) Turn the coarse asbestos back, half a turn.

(7) Insert the fine asbestos clothing under the turn-up, and feed on to the roller.

(8) Cut off the fine asbestos to exactly two turns, again following the weft.

(9) Lay the asbestos back, half a turn.

(10) Insert the sheeting under the turn-up and feed on two complete turns.

(*c*) BACK ROLLER

Procedure as for front roller.

29. Single roll machines

Proceed as for (*a*) and (*b*) above, using the number of rounds indicated in Table No. IX.

30. Intermediate clothing

When the roller becomes undersized from the bedding in of the clothing, the two turns of fine asbestos clothing should be removed and replaced by three turns.

The material removed can be used for press coverings etc.

31. Care of clothing

(*a*) It is important that the roller be neither under nor over-clothed; after clothing, tests as detailed in para. 16 should be applied.

(*b*) The rollers should always be raised clear of the bed when not in use; this is particularly important when steam is on, because although it is of asbestos construction the fabric is not impervious to scorching.

(*c*) The clothing should be manipulated at the end of each working week (if practicable) in the case of single roll ironers, and for double roll ironers whenever the tapes or top covers have to be changed. On such occasions it is advisable that the whole of the fine asbestos be removed, and the finishing round of coarse asbestos be allowed to hang loose for as long a period as possible. By such periodic manipulation, it will be found that the rolls keep up to size, with a consequent improvement of finish and a higher rate of production.