This invention relates to feeding and spreading appliances for ironing machines and has for its object the provision of improved means for automatically spreading out or spreading damp textile sheets and the like as they are automatically fed into ironing machines. According to this invention there is provided a feeding and spreading appliance for use with an ironing machine, comprising one or more pairs of endless brushes arranged to travel in opposite directions transversely of the movement of, for example, a textile sheet while it is carried to the ironing machine by a suitable feeding carrier and disposed so that the sheet may be brought into contact with the outward runs of the endless brushes, means for bringing the sheet into contact with said endless brushes and means for guiding and restraining the transverse motion of the sheet as it passes through the appliance. Preferably the means for bringing the sheet into contact with the endless brushes comprises a second pair of endless brushes also arranged to travel in opposite directions transversely of the movement of the sheet and disposed so that the sheet comes into contact with the outward runs thereof.

According to a feature of this invention means are provided for tensioning the sheet and smoothing out the trailing edge thereof as it leaves the endless brushes said means comprising a pair of wipers of felt, rubber or other suitable material arranged to bear one on either side of the sheet, elements for providing pressure contact between the wipers and means for separating the wipers to permit the feeding carrier to pass between them.

An appliance in accordance with the invention is illustrated in the accompanying drawings, in which the coordinates Figs. 1 and 1A, the latter being broken to illustrate only the extreme ends of one pair of endless brushes, shows a plan view of the appliance; the coordinated Figs. 2 and 2A, both being broken, show a rear elevation thereof.

Figure 3 shows in side elevation the left hand end of the appliance as shown in Figure 2, more particularly the driving mechanism to the endless brushes.

Figure 4 shows in side elevation the cam motion which actuates the opening and closing of the endless brushes and wipers.

Figure 5 is a section on the line V—V of Figure 1, and Figure 6 is a section on the line VI—VI of Figure 1A.

The appliance shown in the accompanying drawings is particularly intended for use in conjunction with the feeding machine described and shown in the specification of my Patent No. 2,767,492. For convenience the feeding carrier element of the feeding machine has not actually been shown in the accompanying drawings.

The appliance comprises endless front spreading brushes 1, 2 and endless rear brushes 3, 4 which are driven to move in the direction of the arrows A, the front and rear brushes being brought together as a textile sheet passes between them, thereby spreading the sheet outwardly from the centre of the appliance.

Each endless brush is preferably constructed by attaching knots of bristles 5 to a flexible band 6 of wedge section as appearing from Figs. 5 and 6, but it will be understood that any suitable alternative construction which provides a friction surface having the required spreading action on a sheet may be employed.

The front brushes 1, 2 are each supported on a driving pulley 7 (Fig. 1) and an idler pulley 8 (Fig. 1A), the mounting of the latter allowing for the adjustment of the tension of the brushes as hereinafter explained.

The front brushes are each further supported on the run thereof which contacts a sheet passing through the appliance by a number of idler pulleys 9. The pulleys 7 and 9 are rotatably mounted on spindles or pins 10 and 11 supported by brackets 12 and 13 respectively (see Figures 1, 1A and 5), the brackets 12 and 13 being carried on a transversely disposed fixed member 14 having end plates 15 bolted to the side frames 16 of the appliance. The idler pulleys 8 are each mounted on a pin 17 supported on a sliding element 18 which may be adjusted by means of a screwed rod 19 to vary the tension in the brush passing round the pulley. The sliding element 18 may be secured to the fixed member 14 by a screw 20 (Fig. 6) passing through an elongated hole in said fixed member.

Motion is imparted to the driving pulleys 7 by a lay shaft 25, which is supported at its opposite ends by bearings 26, 27 bolted to the side frames 16 and by intermediate bearing blocks 28 mounted on the fixed member 14. The lay shaft 25 is driven through a pulley 29 (Fig. 1A) keyed to the end thereof, and has a driving connection with the pulleys 7 by means of bevel gears 30 and 31.

The rear brushes 3, 4 are each supported on a driving pulley 32 and an idler pulley 33, the mounting of the latter allowing, as in the case of the pulleys 8, for the adjustment of the tension of the brushes. The rear brushes are each further supported on the run thereof which contacts a sheet passing through the appliance by an idler pulley 34. Each driving pulley 32 is mounted on one end of a spindle 35 (see Fig. 5), and each idler pulley 33 is rotatably mounted on a spindle or pin 36 (see Fig. 6) supported on a sliding element 37 which may be adjusted by means of a screwed rod 38 to vary the tension in the brush passing round the pulley. The idler pulleys 34 are rotatably mounted on spindles or pins 39 which are carried by bracket 40, the latter being supported as hereinafter explained.

The pulleys which support the rear brushes 3, 4 form part of an assembly comprising a longitudinal member 41 secured at each end to arms 42, 43 and in the centre to arms 44 (Figs. 2 and 2A). The arms 42, 43, 44 are mounted on and secured to the inlay 45 which oscillates in bearings 46, 47 in the sides frames 16. Furthermore, the arms 42, 43 are provided with bearings 42', 43' respectively, for the spindles 35.

Motion is imparted to the driving pulleys 32 by a lay shaft 48 supported by bearings 49 formed in the arms 42, 43 and 44 and at one end in a bearing arm 49, the latter also being secured to the shaft 45. The lay shaft 48 is driven from a pulley and gear unit 50, 50' (see Figs. 2, 2A and 3) freely mounted on an extension 51 of the shaft 45. The gear 50' meshes with a gear 52 keyed to the lay shaft 48. The lay shaft 48 has a driving connection with the spindles 35 by means of bevel gears 53 and 54 (Figs. 2 and 2A).

Power is transmitted to the pulley 29 (to drive the lay shaft 25) and to the pulley 50' (to drive the lay shaft 48) by an endless belt 56 passing around them and also around a pulley 57 driven by a motor 58.
To permit the passage of the feeding carrier between the endless brushes 1, 2 and 3, 4 during the movement thereof in the position in which it receives a sheet to the feed bands of the ironing machine (not shown), the brushes 3, 4 are moved rearwardly away from the brushes 1, 2 by a rocking movement of the arms 42, 43 and 44 and the member 41 carried thereby about the shaft 45 to the position indicated in broken lines in Figures 3 and 5. This rocking movement is effected as will now be explained.

One of the sprocket wheels A which is rotated with the movement of the chains B (Figure 4) supporting the feeding carrier is keyed to a gear 58 which meshes with and so drives a gear 59 to which a cam 60 is secured (Figures 5 and 6). On an extension 61 of the shaft 45 (at the opposite end thereof to the extension 51) is freely mounted an arm 62 having mounted thereon a roller 63 which is caused to bear against the cam 60 by means of a spring 64. The arm 62 is attached to a second arm 65 which is keyed to the extension 61 and has an adjusting screw 66 and locking screw 67, by means of which the forward position of the arm 62 and thus the assembly supporting the rear brushes can be adjusted. The spring 64 is connected at one end to the arm 65 and at the other end to a bracket 66 on the adjacent side frame 16.

The cam 60 makes one complete revolution for each complete intermittent movement of the feeding carrier, and is synchronized with the movement thereof so that the opening and closing of the front and rear brushes occurs at the required time.

A pair of co-acting rubber faced wheels 68, 69 shown in Figs. 1A and 6 are provided to grip a sheet passing through the appliance so that it may travel freely in the direction of movement of the feeding carrier but may not drift to either side by any unequal spreading tension of the endless brushes 1, 2, 3, 4. The wheel 68 is mounted on a pin 70 supported by a bracket 71 mounted on the fixed member 44. The wheel 69 is mounted on a pin 72 supported in an arm 73 hingedly mounted on a pin 74 in the central arm 44. The rollers are pressed together by a spring 75 mounted on a rod 76 hinged to the arm 44 at 77 and having a nut 78 for adjusting the spring pressure.

In order to tension a sheet and to smooth out the trailing edge thereof as it leaves the endless brushes 1, 2, 3, 4, particularly where such edge has a selvedge which may be difficult to smooth out, the additional means hereafter described are provided.

The principal elements of such means comprise a pair of wipers 101, 102, of felt, rubber or other suitable material which may be brought together, as shown in Figures 5 and 6, so that the upper parts of their inner surfaces bear on the opposite sides of a sheet passing through the appliance and after it has passed between the endless brushes thereof. The wipers extend the full width of the appliance and are supported at their lower edges by metal sections 103 and 104 to which they are attached by screws 105 and backing plates 107 and 108.

To provide contact pressure between the wipers when in their closed position a series of leaf springs 109 (see Figure 2) are provided on the outer face of each.

The wiper 101 is arranged to be swung clear of the feeding carrier as it passes through the appliance, said wiper being mounted on a number of brackets 111 secured to a rod 112 which is rotatably supported in bearings in the bearing blocks 28 and end bearings 114 mounted on the side frames 16 as shown in Figs. 1 and 1A. A member 115 is mounted on one end of the rod 112, this member having extended arms 115 and 115 (see Figure 6). The member 115 is supported on a series of brackets 118 mounted on the longitudinal member 41. A series of support members 119 are connected by hinge pins 120 and lugs 121 to the brackets 118, on which is also mounted a spindle 122 fitted with eccentrics 123 which co-act with the supports 119 in conjunction with setting screws 124 and a spring 125 and permit angular adjustment of the support members 119 and the wiper 102 carried thereby about the pins 120. The eccentrics 123 may be turned by a knob 126 (see Figures 1 and 2) on the spindle 122 which may be secured in the desired position by a locking screw 127 which bears on the spindle 122.

When the assembly carrying the rear endless brushes has been rocked rearwardly the wiper 101 and its supporting brackets 111 are free to rock forwardly into the position shown in broken lines in Figure 5, this movement being actually brought about by the engagement of the feeding carrier with the arm 115. When the assembly carrying the rear endless brushes moves to its forward position it carries with it, of course, the wiper 102. Mounted in a bearing 128 and one end of this is forwardly extending bar 129 which is adapted to strike the arm 115 and thus rock the wiper 101 rearwardly again. The engagement of the bar 129 with the arm 115 serves to hold the wipers 101, 102 together, the pressure between the wipers being varied by adjustment of the bar 129 in the bearing 128 in which it is releasably locked by means of a locking screw 130.

As a sheet is drawn through the appliance it passes over a guide bar 131 extending between adjustable bearing brackets 132 on the side frames 16.

The complete operation of the machine will now be briefly described for one complete intermittent movement of the feeding carrier, and is synchronized with the movement thereof so that the opening and closing of the front and rear brushes occurs at the required time.

A feeding and spreading appliance for textile sheets for use with an ironing machine comprising in combination a pair of endless front brushes disposed in end-to-end relationship to engage a textile sheet on one side thereof, a pair of endless rear brushes disposed in end-to-end relationship parallel and opposite to said pair of front brushes adapted to engage said textile sheet on the other side thereof, the runs of the brushes adapted to engage the textile sheet moving transversely of said sheet and outwardly from the center thereof, driving means for moving said brushes transversely and guiding and actuating means urging the leading edge of the textile sheet toward said driving means and in the direction of movement of the endless brushes while the sheet is being restrained from drifting to either side.

2. A feeding and spreading appliance for textile sheets for use with an ironing machine according to claim 1 and comprising means for mutually distancing said pairs of endless brushes in a direction perpendicular to the direc-
tion of their travel in order to bring the said pairs of brushes out of and into cooperation and thus to permit the textile sheet first to be drawn by its leading edge between the pair of brushes and thereafter to be engaged by said pair of brushes on opposite sides thereof.

3. A feeding and spreading appliance for textile sheets for use with an ironing machine according to claim 1 wherein the said guiding means comprise at least one pair of co-acting rubber faced wheels turning about axes parallel to the travel of the brushes and having their co-acting faces in the plane of the meeting edges of the front and rear brushes.

4. A feeding and spreading appliance for textile sheets for use with an ironing machine according to claim 1 comprising means for tensioning the textile sheet and smoothing out the trailing edge thereof as it leaves the endless brushes.

5. A feeding and spreading appliance for textile sheets for use with an ironing machine according to claim 1 comprising a pair of wipers arranged to bear one on either side of the textile sheet for smoothing out the trailing edge thereof as it leaves the endless brushes; elements for providing pressure contact between the wipers; means for separating the wipers to permit the leading edge of the textile sheet to be drawn between them; and means for reapproaching said wipers, said means being operable on the bringing together of the two pairs of endless brushes.

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