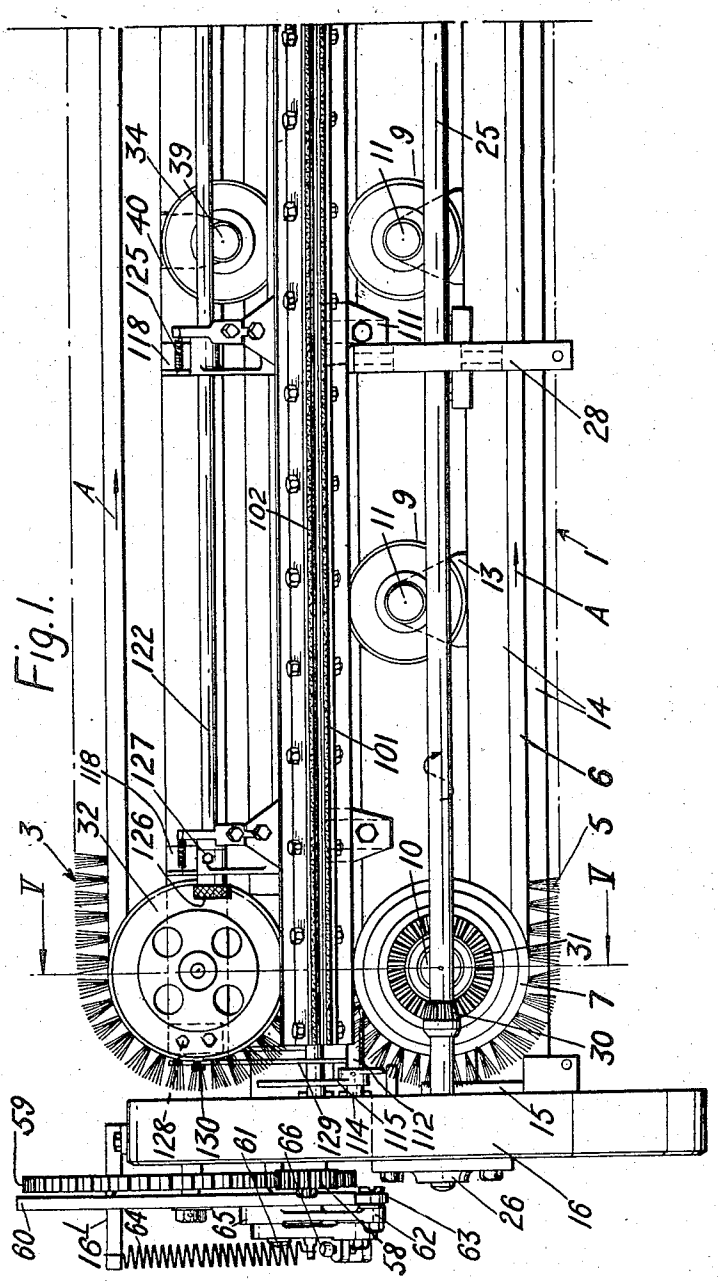
March 24, 1959 L. F. BROAD 2,878,602

FEEDING AND SPREADING APPLIANCES FOR IRONING MACHINES

Filed Feb. 14, 1955 8 Sheets-Sheet 1

Fig. 1.



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FEEDING AND SPREADING APPLIANCES FOR IRONING MACHINES

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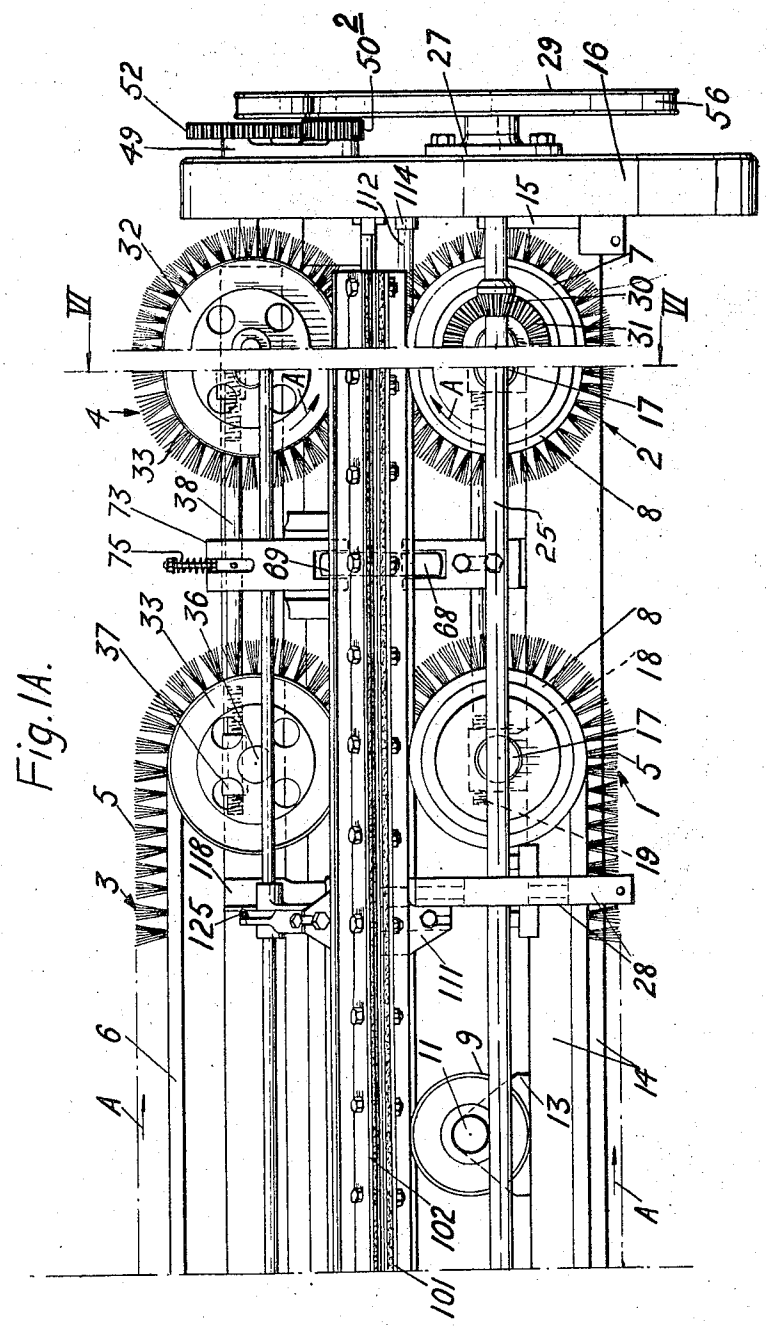

Fig. 1A.

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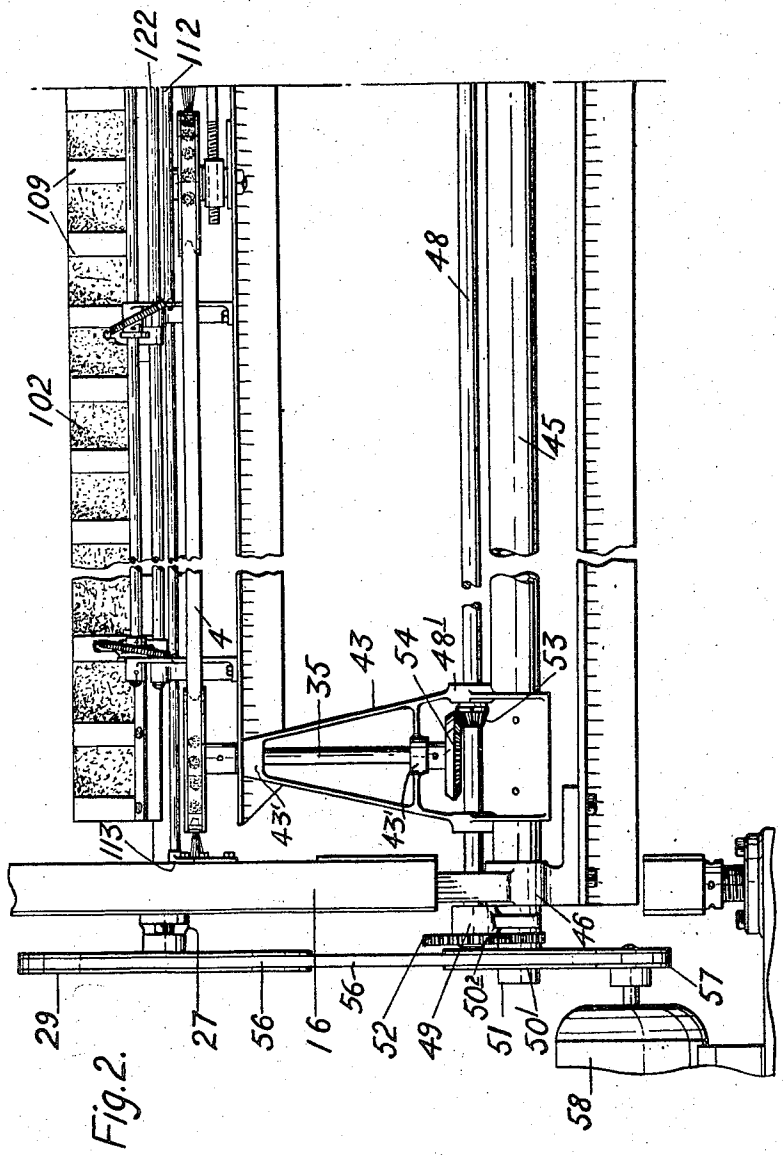

Fig. 2.

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FEEDING AND SPREADING APPLIANCES FOR IRONING MACHINES

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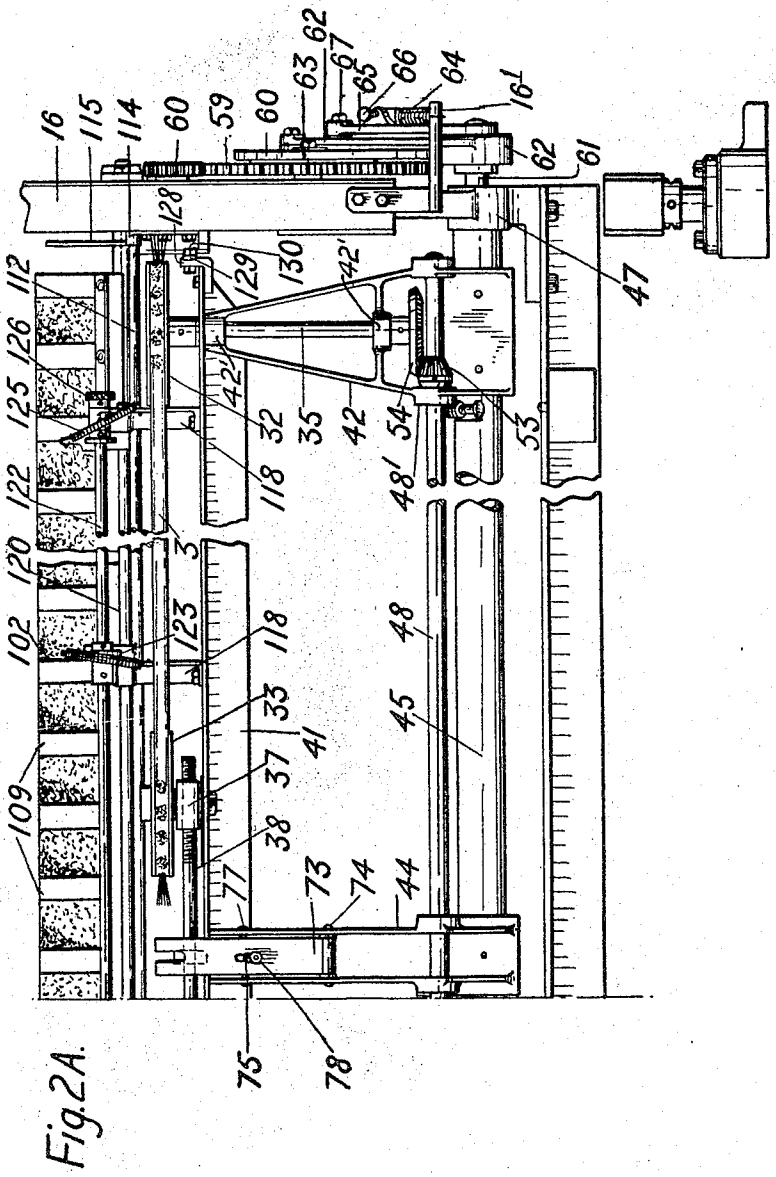

Fig. 2A.

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Fig. 3.

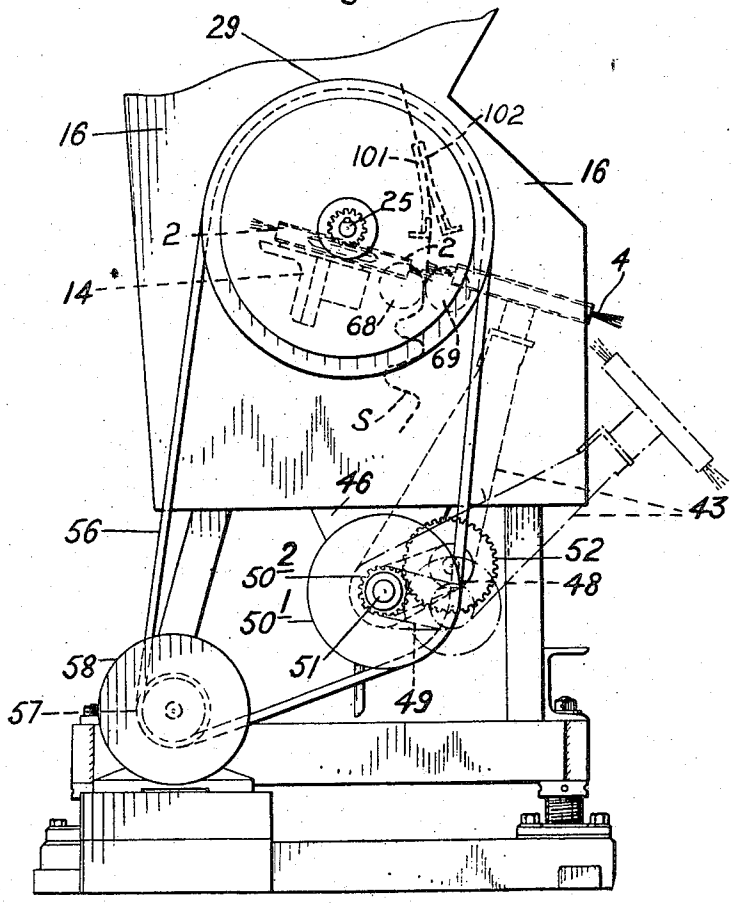

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Fig. 4.

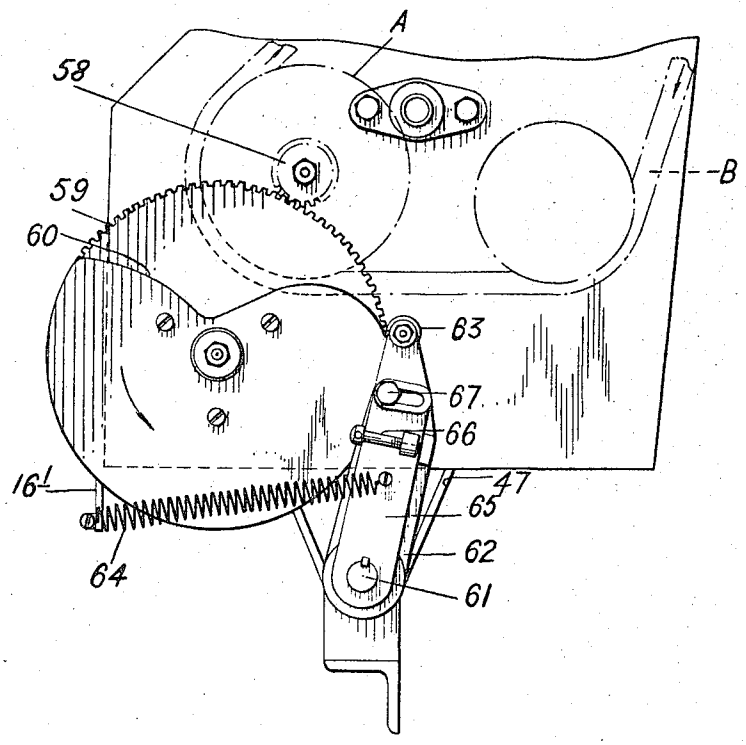

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Fig.5.

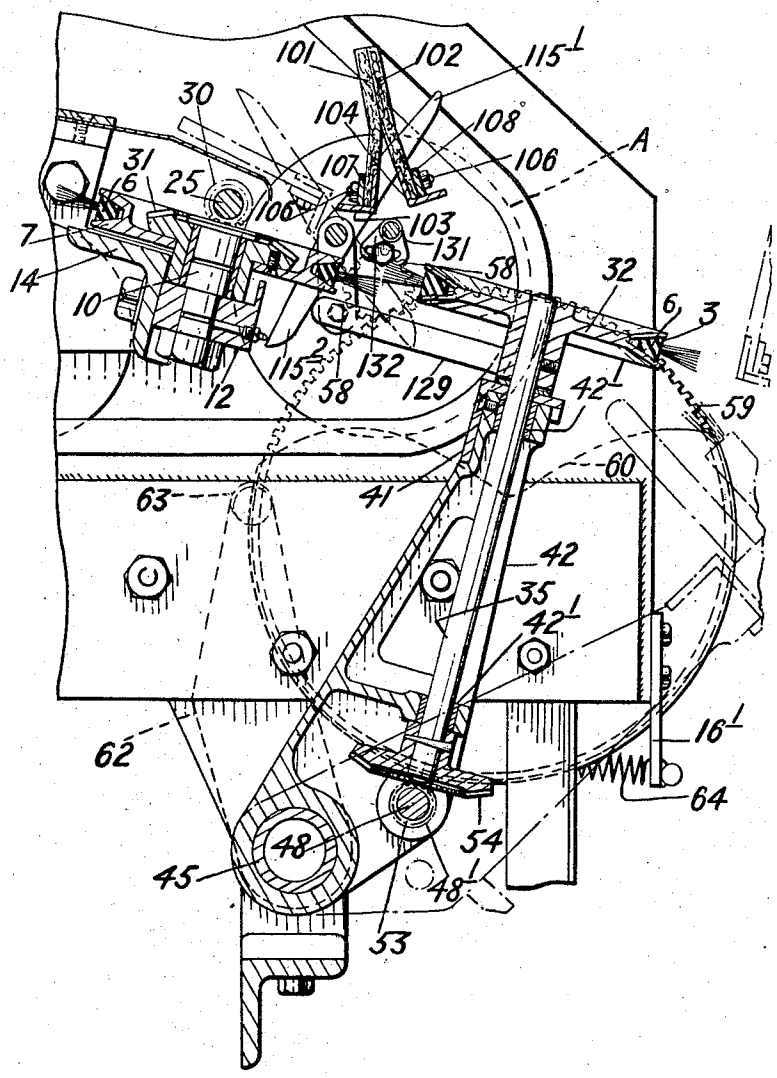

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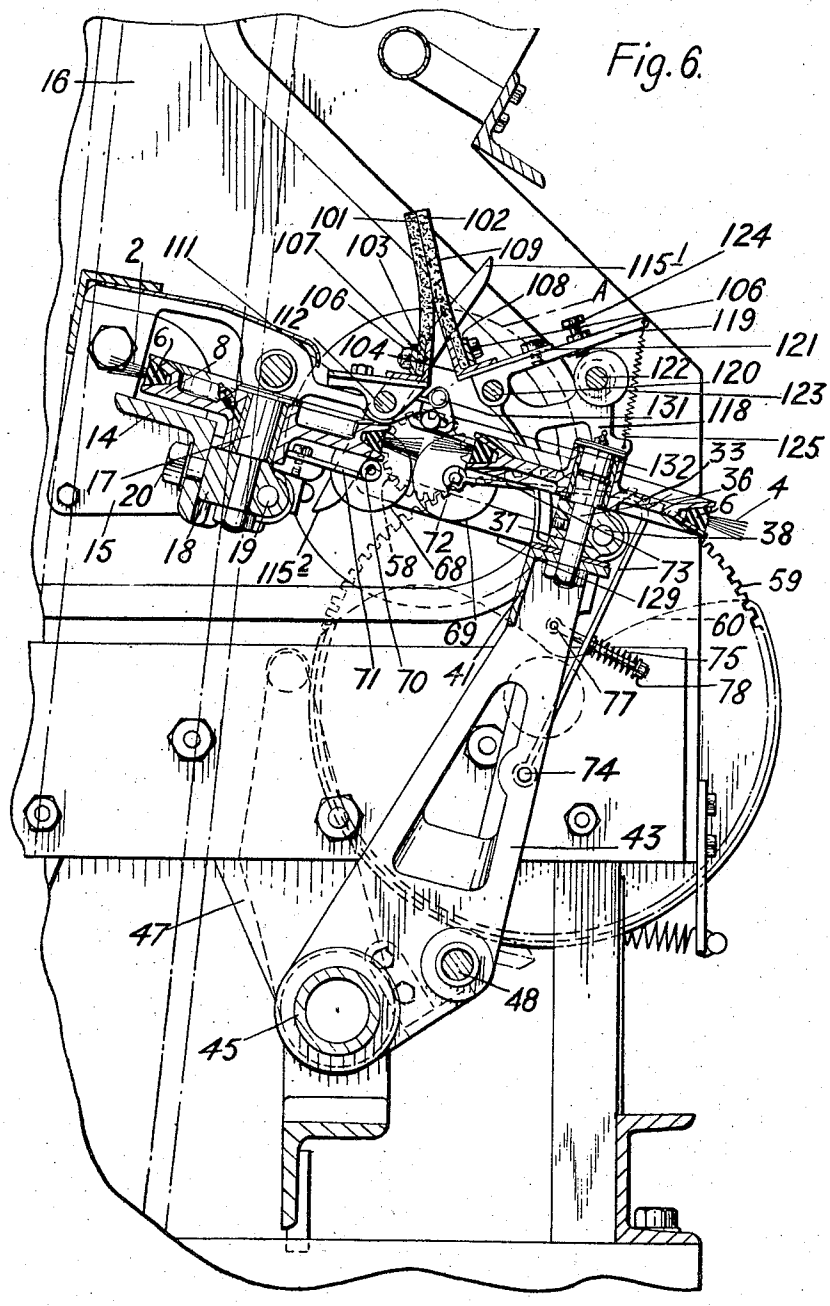
Fig. 6.



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United States Patent Office 2,878,602
Patented Mar. 24, 1959

2,878,602

FEEDING AND SPREADING APPLIANCES FOR IRONING MACHINES

Leonard Frederick Broad, London, England

Application February 14, 1955, Serial No. 487,946

Claims priority, application Great Britain February 18, 1954

5 Claims. (Cl. 38—143)

This invention relates to feeding and spreading appliances for ironing machines and has for its object the provision of improved means for automatically smoothing 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 coordinated Figs. 1 and 1A, the latter being broken to illustrate only the extreme ends of one pair of endless brushes, show 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 is 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 being mounted 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 (Figure 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 idler pulleys 34. Each driving pulley 32 is mounted on one end of a spindle 35 (see Figure 5), and each idler pulley 33 is rotatably mounted on a spindle or pin 36 (see Figure 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 brackets 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 a shaft 45 which can oscillate in bearings 46, 47 in the sides frames 16. Furthermore the arms 42, 43 are provided with bearings 42^1, 43^1, respectively, for the spindles 35.

Motion is imparted to the driving pulleys 32 by a lay shaft 48 supported by bearings 48^1 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 50^1, 50^2 (see Figs. 2, 2A and 3) freely mounted on an extension 51 of the shaft 45. The gear 50^2 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 50^1 (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 from 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 (see 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 **16¹** 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 **14**. 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 **106** 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 feeder 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 **115¹** and **115²** (see Figure 6).

The wiper **102** 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 postion 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 **115¹**. 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** at one end of this assembly is a forwardly extending bar **129** which is adapted to strike the arm **115²** and thus rock the wiper **101** rearwardly again. The engagement of the bar **129** with the arm **115²** serves to hold the wipers **101, 102** together, the pressure between the wipers being variable 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, and it should be borne in mind that this machine operates with the feeding machine described in my aforementioned Patent No. 2,767,492. A sheet S will first be inserted into the carrier of the feeding machine and the chains B thereof started. Due to the cam **60** and the parts associated therewith the rear brushes **3, 4** are caused to move rearwardly thus allowing the carrier to pass between them and the front brushes **1, 2**, and then, after the carrier has passed, to move forwardly again. As the front and rear brushes come together on opposite sides of the sheet trailed by the carrier the wheels **68, 69** grip the sheet between them, and while these wheels allow the sheet to move freely in the direction of pull of the carrier they prevent the sheet being drawn wholly or for the greater part to one side of the machine by the brushes on that side. Moreover, as the front and rear brushes come together the wipers **101, 102** also come together on opposite sides of the sheet; it will be remembered that the wiper **101** is swung clear to enable the carrier to pass it, but is caused to swing forwardly again by the bar **129**. The wipers press on the opposite sides of the sheet and so tension it as it is drawn along by the carrier, and they also serve to smooth out the trailing edge of the sheet as it leaves the brushes **1, 2, 3, 4**.

While one specific embodiment of my invention has been shown and described in detail to illustrate the application of the principles of my invention, it will be understood that the same may be otherwise embodied without departing from such principles and without according the scope of the appended claims.

I claim:

1. 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 brushes in a direction perpendicular to 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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