Oct. 1, 1957 W. O. KRAMER 2,807,894

PRESSING MACHINE

Filed July 25, 1949 2 Sheets-Sheet 1

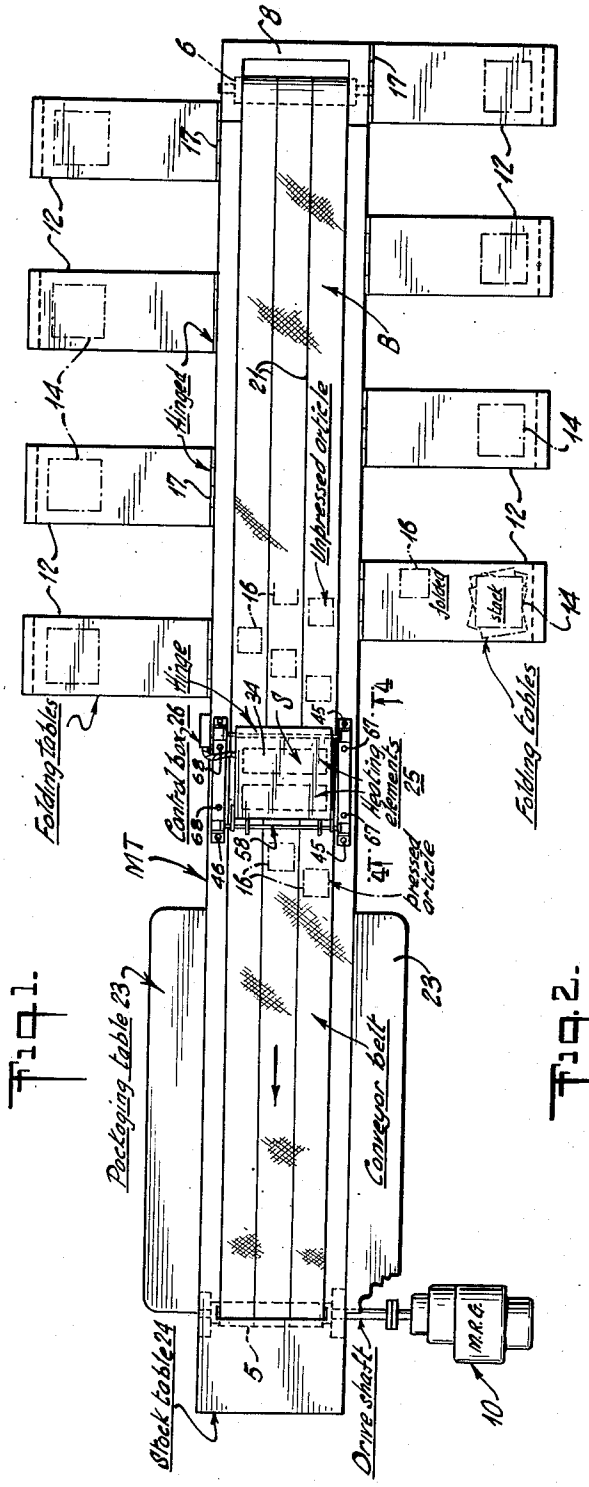


Fig. 1.

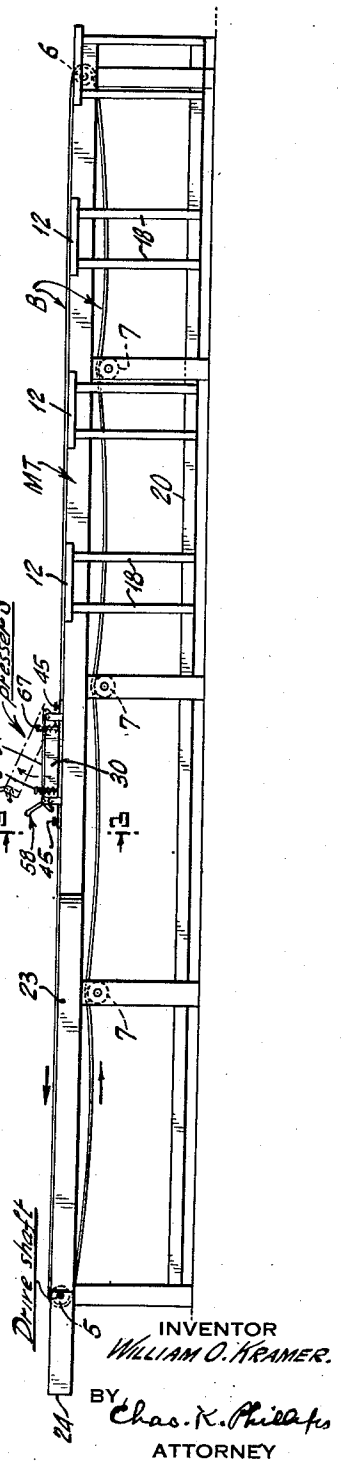


Fig. 2.

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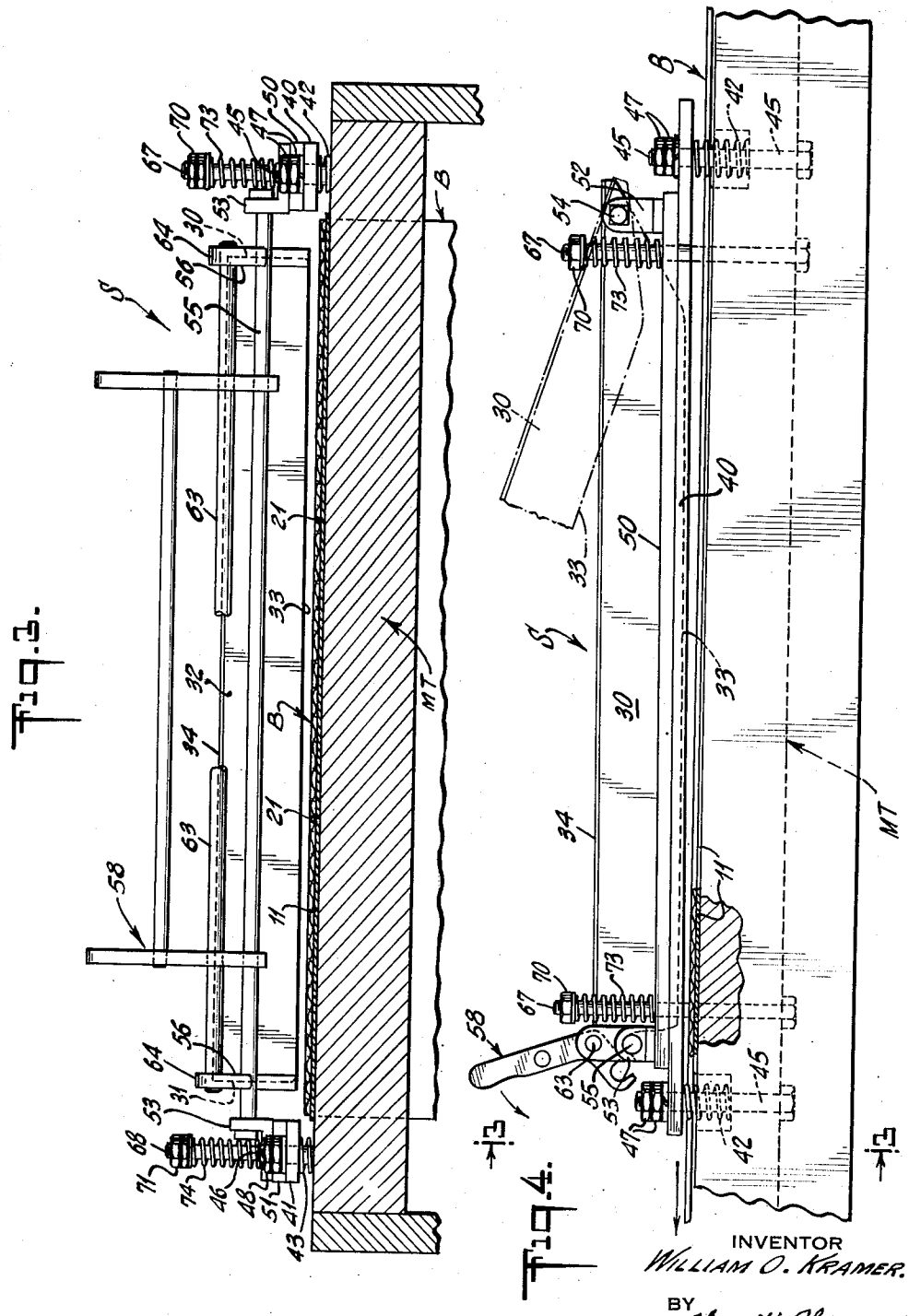


Fig. 3.

Fig. 4.

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United States Patent Office 2,807,894
Patented Oct. 1, 1957

2,807,894

PRESSING MACHINE

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Application July 25, 1949, Serial No. 106,565

15 Claims. (Cl. 38—10)

This invention relates to the method of and a machine for smoothing, pressing, ironing, and compressing folded garments, to give them a more appealing appearance and to facilitate packaging.

Heretofore pressing operations were effected by the use of small presses which required a press operator and a folding operator for each press. The garments were folded and placed on a roller that carried the garments over the ironing surface of an electrically heated shoe arranged in vertical position and let the garments drop out vertically at the lower end of the press.

One of the main objects of this invention is the provision of a method of pressing folded garments which consists in arranging garments folded by a number of operators, flatwise in a horizontal plane, in transporting said garments horizontally flatwise into a pressing region, in pressing said garments and in delivering the pressed garments horizontally flatwise in front of packaging operators in a packing region.

Another main object of this invention is the provision of a machine which will automatically transport garments folded by a number of folding operators, flatwise horizontally through a single automatically operating pressing mechanism and deliver the pressed garments horizontally flatwise in front of a number of packaging operators to be placed in envelopes, to be cellophane wrapped and/or otherwise packed in small containers.

It is a more specific object of this invention to employ a continuously moving horizontal carrier belt providing a long receiving apron or table on one side of a pressing mechanism and a long delivery apron or table on the other side of the pressing mechanism and preferably providing transversely a plurality of zones in which folded garments may be placed, whereby a slow moving carrier belt may be employed to transport the garments folded by a number of folding operators on each side of the machine through the pressing mechanism.

Another object of this invention is the provision of improved means for supporting a presser shoe over a carrier belt including readily adjustable means for raising and lowering the presser shoe to accommodate folded garments of different thicknesses such as light and heavy weight goods and for setting the shoe at an angle with respect to the horizontal to apply increasing pressure on the folded garments in the course of their travel under the shoe, and the provision of means for yieldingly opposing the upward movement of the shoe under the action of the folded garments to control the pressure of the shoe on the folded garments and thereby the compactness of the pressed folded garments.

Numerous other objects and advantages will become apparent from the following description of the invention made with reference to the accompanying drawings in which;

Fig. 1 shows more or less diagrammatically in plan the general layout of the machine and associated operators' tables;

Fig. 2 is a side elevational view of the machine shown in Fig. 1;

Fig. 3 is a vertical cross section through the carrier belt and table at the rear of the presser shoe taken on the line 3—3 on Figs. 2 and 4; and

Fig. 4 shows the presser shoe in its relation to the table and carrier belt when viewed as indicated by the arrows 4—4 in Fig. 1.

The drawings illustrate a preferred mechanism for practising the method according to this invention.

The machine includes, Figures 1 and 2, a long and relatively wide main table generally indicated at MT provided with a smooth table top on which is supported the upper horizontal course of a carrier belt B that passes over rollers **5** and **6** mounted at the ends of the table top and rollers **7** suitably journalled below the table top as shown to support the lower course of the belt. The roller **6** may be journaled in a guard bracket **8** as shown.

The roller **5** is driven counter-clockwise, Figs. 1 and 2, at any desired suitable speed by any well known motor reduction gear mechanism such as indicated broadly at **10** to give the upper course of the carrier belt B a continuous movement at any desired speed toward the left as indicated by the arrow thereon, to carry folded garments under and past a presser shoe S, the construction of which will be described later. A smooth faced plate **11** is preferably affixed in the top of the table directly under the presser shoe S.

The right hand section of the upper course of the carrier belt, Figs. 1 and 2, constitutes a receiving apron or table upon which the folded garments are placed. The carrier belt is preferably made wide enough so that folded garments may be arranged thereon in a plurality of rows for the convenience to folding operators on opposite sides of the table and for increasing the capacity of the machine. It is made long enough to accommodate a plurality of folding operators on each side of the machine and preferably a folding table **12** is provided for each folding operator. These folding tables may be arranged in staggered relation to save space and for the convenience of right and left handed operators.

Each folding table **12** may be rectangular as shown providing an area for receiving a pile or stack **14** of unfolded garments and a working area on which the garments may be folded as indicated by a folded garment at **16**. The inner end of each folding table **12** may be suitably supported on the edge of the main table by any suitable hinge construction **17** and its outer end by legs **18** which may be hinged thereto (not shown) and resting preferably on a base rail **20** as indicated. The folding tables **12** may be separably mounted on or integrally connected to the main table as desired. It is preferable to mount these tables with their upper surfaces substantially in the plane of the carrier belt so that the folded garments may be removed from the folding tables and placed on the carrier belt by a horizontal movement to prevent any disturbance of the folded condition of the garments.

As shown in Figs. 1 and 3, the wide carrier belt B may be divided by demarcations, such as threads **21** in a woven belt, into a plurality of zones, and if desired folded garments may be placed and arranged in these zones to approach the presser shoe in the order shown in Fig. 1 so that the folded garments are carried in succession under the presser shoe successively in different transverse zones, thus facilitating uniform heating of the presser shoe and uniform pressing, ironing and compressing of the folded garments.

The folded garments so arranged or placed on the carrier belt or in any other desired or casual arrangement are carried without being disturbed under and past the presser shoe into a packaging and packing region at

the left hand end of the machine, Figs. 1 and 2, where they are removed by packaging operators stationed on each side of the main table for the convenience of which long narrow working or boxing tables **23** may be provided formed on or secured to the main table in any suitable manner. It is desirable for the convenience of the packaging operators to arrange the top surfaces of these tables substantially in the plane of the carrier belt B. This also permits the pressed folded garments to be transferred flatwise horizontally to the packaging operators' tables.

It is clear now that the folded garments are always moved flatwise horizontally from the folding tables to the continuously moving carrier belt to the packaging or boxing tables. The entire pressing operation as will appear more clearly later is automatic thereby avoiding the necessity of employing as heretofore, operators for starting and stopping the machines for each folded garment pressed.

A stock table **24** may, if desired, be provided at the left hand end of the machine to support a supply of envelopes, etc., or packaged goods as desired.

The method can be practised best and the advantages of the system can be obtained more fully by the use of a presser shoe S shown in detail in Figs. 3 and 4.

Referring to Figs. 3 and 4, the presser shoe S, which is rectangular in plan as shown in Fig. 1, may be of any suitable construction and could be a single solid block of any material, of metal in case it is to be heated by burner jets playing on its upper face. It is desired however to make the shoe hollow to receive any suitable preferably electrical heating elements **25**, Fig. 1, regulated from any suitable known control box **26** as indicated. It may comprise identical side members **30** and **31**, Figs. 3 and 4, a back piece **32**, and a bottom smoothing plate **33**, integrally cast or connected together in any suitable manner, and a removable top cover plate **34**.

The lower edges of the side members and the lower face of the smoothing plate are preferably curved at their forward ends as shown in Fig. 4 to press the folded garments against the carrier belt B, the surface of which is preferably rough, to be carried by the carrier belt against and under the smoothing face of the presser shoe to be smoothed, pressed, ironed and compressed thereby without disturbing the folded condition of the garment as by pushing back the front end of the folded garment. The presser shoe S is preferably longer than the width and length of the folded garment so as to press on the entire area of the folded garment at some time during its movement under the presser shoe. By the means about to be described, the presser shoe may be raised and lowered for different thicknesses of folded garments and may be inclined to the rear so that the pressing pressure will increase as the folded garment is moved past the presser shoe.

The presser shoe S, Figs. 3 and 4, is supported on plates **40** and **41** located laterally of the sides of the presser shoe supported respectively on compression springs **42** and **43** seated in recesses in the table MT and surrounding bolts **45** and **46** suitably anchored against the upward movement in the table MT and pasisng loosely through apertures in the plates **40** and **41**. The upper ends of the bolts are equipped with nuts **47** and **48** as shown bearing on the upper faces of the plates to lower the presser shoe against the expansion of the springs to provide the proper spacing of the presser shoe from the carrier belt for folded garments of different thicknesses and to position the front end of the presser shoe farther from the carrier belt than its rear end to prevent pushing up the forward edges of the folded garments as they are carried below the presser shoe and to increase the pressing pressure as the folded garments are carried toward the rear end of the presser shoe.

In order that the presser shoe may be lifted by the folded garments to prevent pushing together of the folded garments and in order also to regulate the pressure of

the presser shoe on the garments, the presser shoe S is indirectly supported on the plates **40** and **41** by means of plates **50** and **51** resting on the plates **40** and **41**. Each plate **50** and **51** is provided with perforated lugs **52** and **53** to support rods **54** and **55**. The rod **54** is supported in the lugs **52** and extends through apertures in the side walls of the front end of the presser shoe and the rod **55** is supported by the lugs **53** and extends along the rear end of the presser shoe and under lugs **56** on the rear ends of the side plates of the presser shoe. The presser shoe is connected to the supporting plates **50** and **51** by any quickly releasable hook lock connection **58** pivoted on a rod **63** supported in upstanding ears **64** on the upper edges of the rear ends of the side plates of the presser shoe and movable into and out of the locking engagement with the rod **55** carried by the rear ends of supporting plates **50** and **51**. By means of this constructon the rear end of the presser shoe may be lifted away from the carrier belt to prevent overheating of the carrier belt at the conclusion of a run of the machine, and for inspection and cleaning of the smoothing surface of the presser shoe. Any suitable means (not shown) may support the presser shoe in raised position.

The supporting plates **50** and **51** are held against movement longitudinally respectively by the bolts **67** and **68** suitably anchored against upward movement in the table MT as shown and passing loosely through alined apertures in the plates **40** and **50** and **41** and **51**, and which at their upper ends are threaded to receive tension adjusting nuts **70** and **71** for adjusting the tension of springs **73** and **74** to regulate the pressure of the presser shoe on folded garments being pressed. The springs **42** and **43** are strong enough to raise the presser shoe under control of the nuts **47** and **48**. The springs **73** and **74** are weaker to permit the presser shoe to rise as a folded garment is carried under it and are so adjusted as to press the presser shoe against the folded garment with the pressure necessary to produce the desired appearance and compactness of the folded garment.

The machine is prepared for operation for pressing a run of folded garments of the same weight by raising or lowering the presser shoe S as required. The front end of the presser shoe S is positioned under control of the springs **42** and **43** and the adjusting nuts **47** and **48** at the front ends of the supporting plates **40** and **41**, to receive the folded garments and press them against the carrier belt B without disturbing the folded condition of the garment. The rear end of the presser shoe S is raised or lowered by means of the springs **42** and **43** and the adjusting nuts **47** and **48** at the rear ends of the supporting bars **40** and **41** to incline the presser shoe toward the rear to cause the folded garment to be compressed under increasing pressure as it is carried along the lower surface of the presser shoe and to limit the degree of compacting that may be effected by the presser shoe.

The springs **73** and **74** engaging the front ends of the supporting plates **50** and **51** are then adjusted to yield to permit the presser shoe to be raised by the moving folded garments without disturbing the folded condition of the folded garments and at the same time slightly compress the folded garments and press them into frictional engagement with the carrier belt B to be carried thereby under the presser shoe S. The springs **73** and **74** engaging the rear ends of the supporting plates **50** and **51** are adjusted to control the final pressing and compacting pressure of the presser shoe S on the folded garments.

It may be necessary to set or reset the control box for the heating elements **25** to heat the presser shoe S to the temperature best suited for the weight or character of the garments to be pressed and the rate at which they are pressed. Likewise it may be necessary or desirable to adjust the speed of travel of the carrier belt B to control the length of time during which the folded garments are subjected to heat and pressure by the presser shoe. The presser shoe S may be pivoted away from the carrier belt as it is brought up to the desired temperature. In

any event, the carrier belt should be in motion whenever the presser shoe is in operating position to prevent injury to the carrier belt.

After the machine has been started, the folding operators fold the garments on the folding tables and transfer them horizontally flatwise onto the slow moving carrier belt in any spaces available or in spaces and zones to each folding operator. The carrier belt then carries the folded garments horizontally flatwise under and across the smoothing face of the presser shoe into the delivery region where the packaging operators remove them preferably horizontally flatwise from the carrier belt to package or pack them as desired. The pressing operation is entirely automatic requiring no press operator and no attention from any of the folding or packaging operators, except to start and stop the machine and pivot the presser shoe away from the carrier belt at the end of a run.

The invention has been described in detail with reference to a specific embodiment of mechanism well-adapted for attaining the objects stated. This specific disclosure is not to be considered as limiting as variations of the invention may become apparent to those familiar with this art after understanding of the principles of this invention.

What is claimed is:

1. In a pressing machine, the combination of a continuously moving carrier belt having a long upper horizontal course extending through receiving, pressing and delivery regions, means for moving said belt to carry folded garments from the receiving region into the pressing region and from thence into the delivery region and a vertically movable presser shoe disposed over said belt in said pressing region and provided with a flat ironing face inclined in the direction of movement of said belt for applying downward pressure on folded garments in said pressing region.

2. In a pressing machine, the combination of an endless carrier belt, means supporting said belt to provide it with a straight course, a presser shoe disposed to cooperate with said straight course, said shoe having its entire pressing face inclined toward said straight course in the direction of movement of said belt.

3. In a pressing machine, the combination of an endless carrier belt, means supporting said belt to provide it with a straight course, a presser shoe disposed to cooperate with said straight course, said shoe having its entire pressing face inclined toward said straight course in the direction of movement of said belt, and means for adjusting the distance between said shoe and belt and the angle of inclination of said pressing face.

4. In a pressing machine, the combination of an endless carrier belt, means supporting said belt to provide it with a straight course, a presser shoe disposed to cooperate with said straight course, said shoe having its entire pressing face inclined toward said straight course in the direction of movement of said belt, means for adjusting the distance between said shoe and belt and the angle of inclination of said pressing face, and adjustably controlled spring pressure means for urging said shoe toward said belt.

5. The combination with a horizontally movable article transporting belt, a pressing shoe disposed above said belt to press articles carried under said shoe by said belt, said shoe being provided with a flat smoothing face extending in the direction of movement of said belt and curved upwardly at its forward edge to compress said articles and press them into frictional contact with said belt, means supporting said shoe to incline its smoothing face in the direction of travel of the belt, and means resiliently holding said shoe on said supporting means whereby said shoe may be raised by articles passing under it.

6. The combination with a horizontally movable article transporting belt, a pressing shoe disposed above said belt to press articles carried under said shoe by said belt, said shoe being provided with a flat smoothing face extending in the direction of movement of said belt and curved upwardly at its forward edge to compress said articles and press them into frictional contact with said belt, means supporting said shoe to incline its smoothing face in the direction of travel of the belt, and means resiliently holding said shoe on said supporting means whereby said shoe may be raised by articles passing under it, said latter means being adjustable to control the pressing pressure of said shoe.

7. In a pressing machine, the combination with a supporting table, of an endless carrier belt provided with a long horizontal course supported on said table, a presser shoe disposed above said horizontal course intermediate of its ends, means on said table supporting said shoe to incline its smoothing face in the direction of travel of said belt and at any desired distance from said belt, and yielding means pressing said shoe downwardly against its supporting means.

8. In a pressing machine, the combination with a supporting table, of an endless movable carrier belt provided with a long horizontal course supported on said table, a presser shoe disposed above said belt intermediate of the ends of said horizontal course and having a flat smoothing face inclined toward said belt in the direction of movement of said belt, a shoe supporting plate at each side of said shoe, means supporting each plate at any desired distance from said table, a plate connected to each side of said shoe and seated on the corresponding supporting plate, and means yieldingly holding said second mentioned plates on said first mentioned plates.

9. In a pressing machine, the combination with a supporting table, of an endless movable carrier belt provided with a long horizontal course supported on said table, a presser shoe disposed above said belt intermediate of the ends of said horizontal course and having a flat smoothing face inclined toward said belt in the direction of movement of said belt, a shoe supporting plate at each side of said shoe, means supporting each plate at any desired distance from said table, a plate connected to each side of said shoe and seated on the corresponding supporting plate, and means yieldingly holding second mentioned plates on said first mentioned plates, said last mentioned means comprising spring means interposed between said second mentioned plates and said table.

10. In a pressing machine, the combination with a supporting table, of an endless movable carrier belt provided with a long horizontal course supported on said table, a presser shoe disposed above said belt intermediate of the ends of said horizontal course and having a flat smoothing face inclined toward said belt in the direction of movement of said belt, a shoe supporting plate at each side of said shoe, means supporting each plate at different distances from said table, a plate connected to each side of said shoe and seated on the corresponding supporting plate, and means yieldingly holding said second mentioned plates on said first mentioned plates, said last mentioned means comprising bolts anchored in said table, adjusting nuts in the upper ends of said bolts and expansion springs interposed between said nuts and the upper faces of said second mentioned plates.

11. In a pressing machine, the combination with a supporting table, of an endless movable carrier belt provided with a long horizontal course supported on said table, a presser shoe disposed above said belt intermediate of the ends of said horizontal course and having a flat smoothing face inclined toward said belt in the direction of movement of said belt, a shoe supporting plate at each side of said shoe, means supporting each plate at different distances from said table, a plate connected to each side of said shoe and seated on the corresponding supporting plate, and means yieldingly holding said second mentioned plates on said first mentioned plates, said last mentioned means comprising bolts anchored in said table, adjusting nuts on the upper ends of said bolts and expansion springs interposed between said nuts and the

upper faces of said second mentioned plates, said bolts passing through alined apertures in said first and second mentioned plates.

12. In a pressing machine, the combination with a supporting table, of an endless movable carrier belt provided with a long horizontal course supported on said table, a presser shoe disposed above said belt intermediate of the ends of said horizontal course and having a flat smoothing face inclined toward said belt in the direction of movement of said belt, a shoe supporting plate at each side of said shoe, means supporting each plate at different distances from said table, a plate connected to each side of said shoe and seated on the corresponding supporting plate, and means yieldingly holding said second mentioned plates on said first mentioned plates, said last mentioned means comprising spring means interposed between the front and rear ends of said second mentioned plates and said table.

13. In a pressing machine, the combination with a supporting table, of an endless movable carrier belt provided with a long horizontal course supported on said table, a presser shoe disposed above said belt intermediate of the ends of said horizontal course and having a flat smoothing face inclined toward said belt in the direction of movement of said belt, a shoe supporting plate at each side of said shoe, means supporting each plate at different distances from said table, a plate connected to each side of said shoe and seated on the corresponding supporting plate, and means yieldingly holding said second mentioned plates on said first mentioned plates, said last mentioned means comprising bolts anchored in said table at the front and rear ends of said second mentioned plates and spring means cooperating with said bolts and second mentioned plates to yieldingly hold said second mentioned plates on said first mentioned plates.

14. In a pressing machine, the combination with a supporting table, of an endless movable carrier belt provided with a long horizontal course supported on said table, a presser shoe disposed above said belt intermediate of the ends of said horizontal course and having a flat smoothing face inclined toward said belt in the direction of movement of said belt, a shoe supporting plate at each side of said shoe, means supporting each plate at different distances from said table, a plate connected to each side of said shoe and seated on the corresponding supporting plate, and means yieldingly holding said second mentioned plates on said first mentioned plates, said last mentioned means comprising bolts anchored in said table at the front and rear ends of said second mentioned plates and spring means cooperating with said bolts and second mentioned plates to yieldingly hold said second mentioned plates on said first mentioned plates, said bolts passing through alined apertures in said first and second mentioned plates.

15. In a pressing machine, the combination with a supporting table, of an endless movable carrier belt provided with a long horizontal course supported on said table, a presser shoe disposed above said belt intermediate of the ends of said horizontal course and having a flat smoothing face inclined toward said belt in the direction of movement of said belt, a shoe supporting plate at each side of said shoe, means supporting each plate at different distances from said table, a plate connected to each side of said shoe and seated on the corresponding supporting plate, and means yieldingly holding said second mentioned plates on said first mentioned plates, means pivotally supporting the front end of said shoe on said second mentioned plates, and means on said second mentioned plates providing a rest for the rear end of said shoe.

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