Oct. 4, 1955 R. W. BRADLEY ET AL 2,719,901

SHOE MAKING APPARATUS

Filed June 9, 1953 4 Sheets-Sheet 1

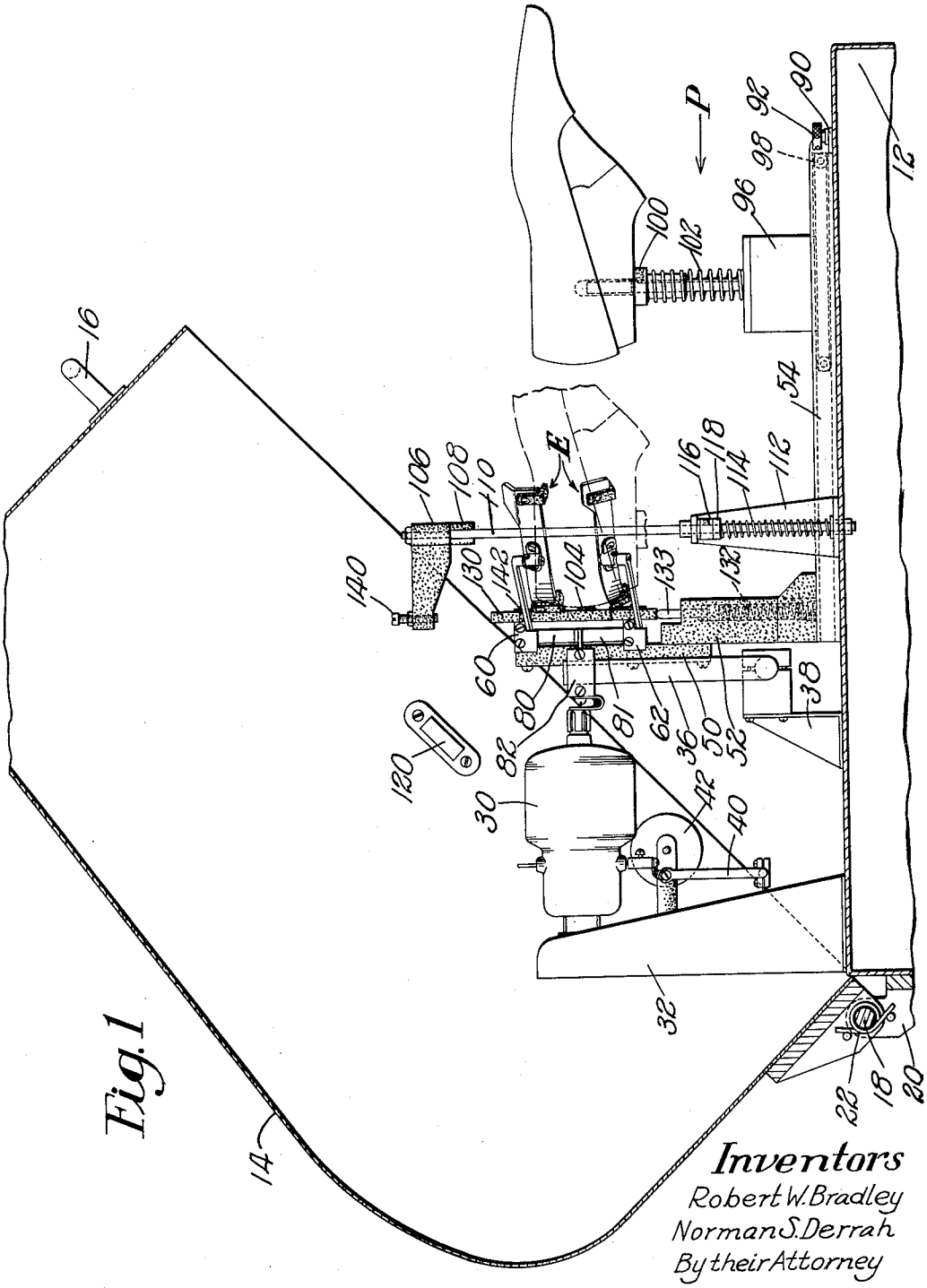


Fig. 1

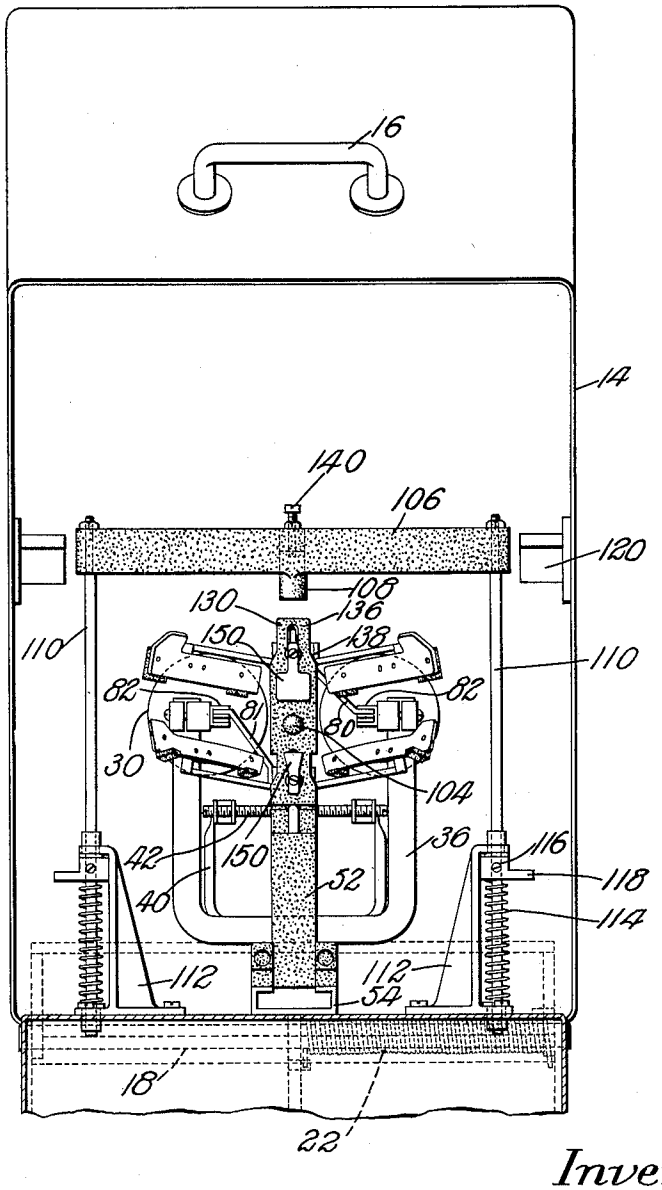
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SHOE MAKING APPARATUS

Filed June 9, 1953 4 Sheets-Sheet 2

Fig. 2



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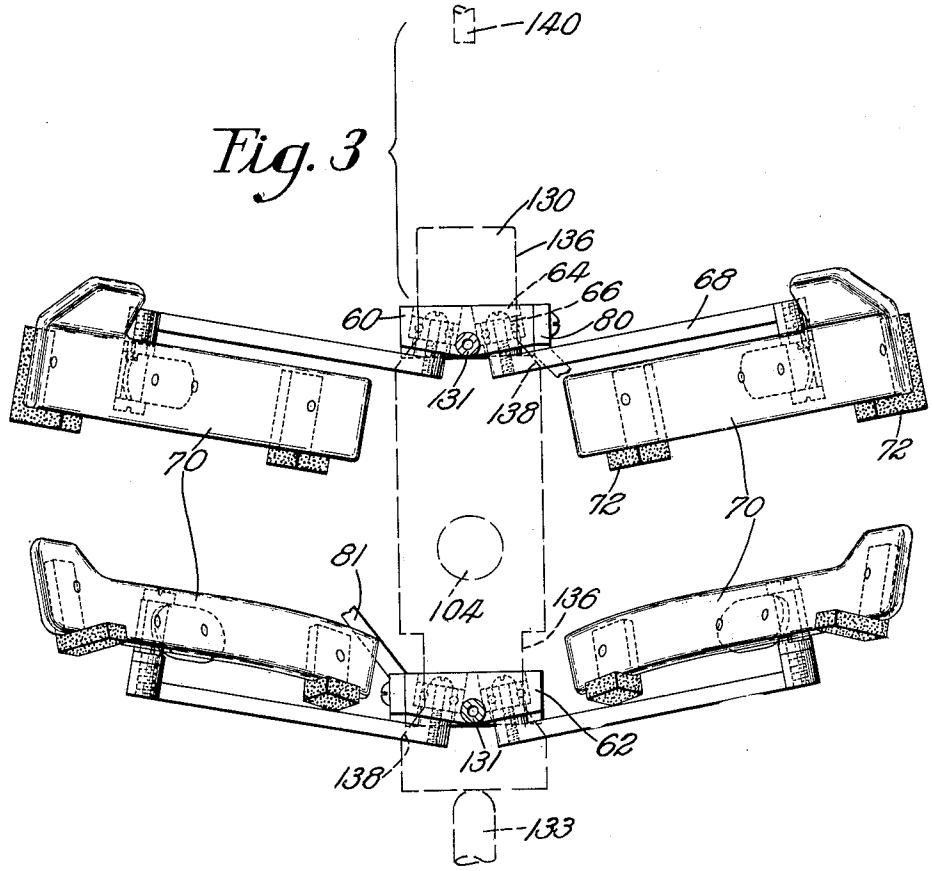
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SHOE MAKING APPARATUS

Filed June 9, 1953 4 Sheets-Sheet 3

Fig. 3



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Oct. 4, 1955 R. W. BRADLEY ET AL 2,719,901

SHOE MAKING APPARATUS

Filed June 9, 1953 4 Sheets-Sheet 4

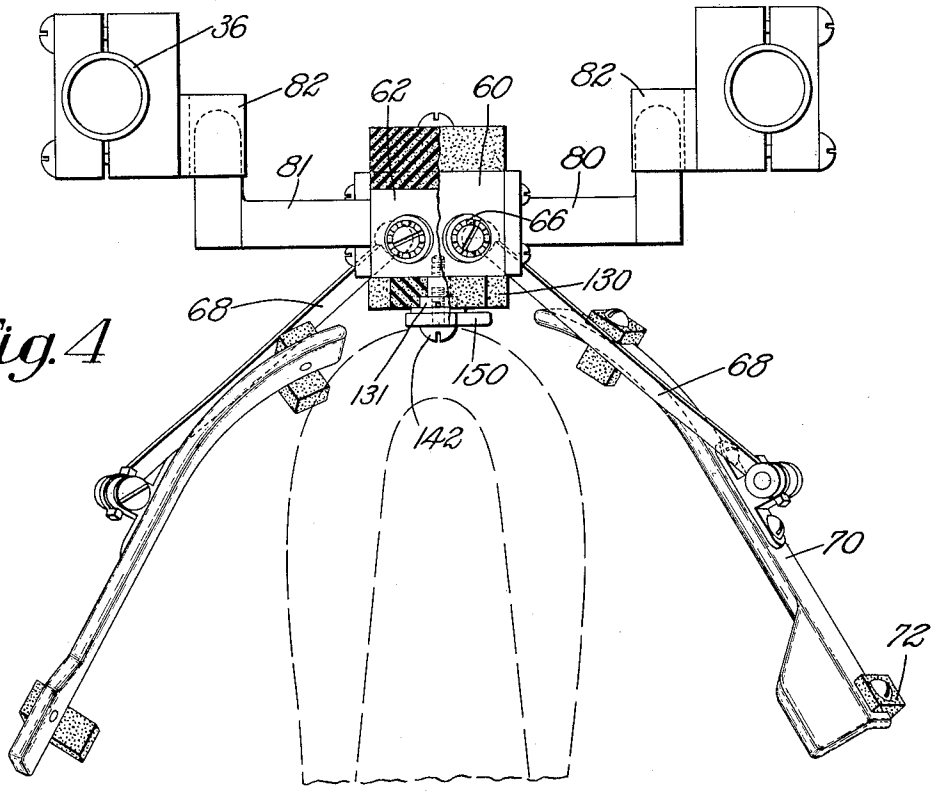


Fig. 4

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SHOE MAKING APPARATUS

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Application June 9, 1953, Serial No. 360,568

3 Claims. (Cl. 219—10.63)

This invention relates to an apparatus for making shoes and more particularly to improvements in apparatus for dielectrically heating the end portion of a lasted shoe for the purpose of converting limp stiffener material incorporated in the upper thereof to a stiffened condition for the purpose of providing a stiffened shoe end portion.

In an advantageous method of stiffening selected upper portions of the end of a shoe, it has been the practice to incorporate into the selected portion, in limp condition, a material which may be converted to a stiffened condition by subjection to a high-frequency electric field. Such a method, for example, is described in United States Letters Patent No. 2,539,608, issued January 30, 1951, upon an application filed in the name of John J. Brophy. The stiffener material is in general convertible by any form of heat, but a high-frequency electric field has been found particularly advantageous in converting the material since its location beneath the upper leather makes difficult rapid heating of the material by conduction through the upper materials.

Apparatus for dielectrically heating an end portion of a shoe may be provided in which an alternating electric field is established between electrodes operatively positioned adjacent to such portion. In such apparatus the operative position of the electrodes may differ with different sizes and styles of shoes. Because of the need for rapid operation in factory production and because of the need to accommodate a large range of styles and sizes of shoes, it is desirable to provide for quick and easy positioning of the electrodes in operative position for each shoe to be heated in its turn and yet to provide for minimizing interference by the electrodes with loading and unloading.

At the same time, any means for operatively positioning the electrodes must avoid, during the heating operation, excessive pressure upon the upper materials, particularly at the sides of the shoe, since some delicate upper materials may be marked thereby.

An important object of the invention accordingly is the provision of an electrode arrangement for establishing an electric field in the heel end portion of a shoe, and in which electrode members may be quickly and easily moved into operative position adjacent to the sides of the shoe and there supported with a minimum of inward pressure.

To this end and in accordance with a feature of this invention, an electrode assembly is provided wherein each of a pair of electrode elements is supported upon a carrier for movement therewith toward and away from the other element in a predetermined oblique path inclined slightly downward toward the other, so that the electrode elements tend to fall together and are adapted thereby gently to engage opposite sides of a workpiece. In the illustrative embodiment, the pair of electrode elements is supported by a pair of pivoted arms which, in accordance with a feature of this invention, have inwardly and upwardly tilted co-planar pivot axes so that

gravity provides an inwardly biasing force to the electrode members, which force can conveniently be maintained at a very small and constant magnitude.

Another object of the invention is to provide improved means for facilitating the insertion of a workpiece into such apparatus. In accordance with another feature of the invention, a cover-operated sliding wedge separator is provided to separate the arms when the cover is opened and to release the arms when the cover is closed.

These and other features and advantages of the invention to be defined in the claims are described in detail in the following specification in connection with the accompanying drawings in which

Fig. 1 is a side elevation partly in section of an apparatus embodying the invention;

Fig. 2 is a front elevation partly in section of the apparatus shown in Fig. 1;

Fig. 3 is an enlarged front elevation of the electrode assembly shown in Fig. 1; and

Fig. 4 is an enlarged plan view partly in section of the electrode assembly shown in Fig. 1.

Referring to Figs. 1 and 2, the apparatus comprises a lower section or cabinet (not shown) containing a power supply and an upper section or chassis **12** on and within which are mounted the components of a high-frequency oscillator and on which are mounted counter activating electrodes E and a shoe supporting mechanism P. A tiltable cover **14** having a handle **16** is mounted on the chassis **12** by a rod **18** journaled in brackets **20** secured to the chassis. The cover is normally held open by a spring **22** but may be moved down by the handle **16** to a position completely enclosing the top of the chassis, in which position it may be automatically locked for the duration of the treatment by means not shown. In the illustrative apparatus, the oscillator tubes **30** are supported on a bracket **32** at the rear of the chassis. The anodes of the tubes are connected to the ends of an anode tank **36** which is mounted on a support **38** secured to the chassis **12**, while the tube grids are connected to a grid tank **40**. A variable condenser **42** is provided for adjusting the resonant frequency of the grid circuit.

The electrodes E are mounted on an upright member **50** (Fig. 1) of insulating material, the upright member **50** being secured in turn to the back of a support **52** which is fastened at the rear of a removable track **54** on which the shoe supporting mechanism P rides. At the top of the upright member **50** is secured a bearing mount **60** for the upper electrode while beneath this mount there is secured another bearing mount **62** for the lower electrode. Each mount is formed with a pair of holes **64** (Fig. 3) to receive a pair of ball bearings **66** on which the arms **68**, which support the pairs of electrode elements **70**, are pivoted. The holes **64** and accordingly the bearings **66** are not axially aligned, but are inclined with the pivot axes converging at an acute angle at a point above the bearings so that the arc of the swing of the arms **68** as they bring the electrode element **70** against the shoe has a downward component of movement which is small with respect to the horizontal component of movement but which nevertheless suffices to provide an inward bias force to the arms **68** and electrode elements **70** because of the effect of gravity. Each electrode element **70** is provided with a pair of insulating spacer members **72** which engage the side of a shoe to align the electrode elements with such sides.

Energization of the electrodes by the oscillator is provided through a connection between each bearing mount **60**, **62** and one end of the anode tank **36**. For this purpose conductors **80**, **81** (Fig. 2) are used and each is connected at one end to one of the bearing mounts **60**,

62 while its other end is formed to cooperate with a spring clip connection 82 at one or the other end of said tank in the manner of a knife switch, so that the connection may be made by sliding of the track 54 rearwardly as it is brought into the position shown in Fig. 1. The track 54 may be clamped to the chassis by thumb screws 92 engaging ears 90 at the front ends of the track.

The shoe positioning mechanism includes a carriage 96 having wheels 98 rolling in the track 54 and carrying a jackpost 100 mounted for vertical movement and biased upwardly by a spring 102. The upper limit of movement of the jackpost is arranged to present the heel end portion of the shoe to the electrodes at the right height for a shoe having a last of the lowest cone height. Accordingly the position of the heel end portions of shoes having greater last cone heights will be somewhat above the correct operating position when the shoe is pushed into the dotted position shown in Fig. 1 in which the heel end engages a stop gage 104. Accordingly a bridge member 106 having a heel-end engaging projection 108 is arranged above the electrodes to push the shoe down to operating position when the cover 14 is closed. For this purpose the bridge member 106 is supported by a pair of rods 110 slidable vertically in brackets 112 secured to the chassis and biased upwardly by springs 114 which act upon collars 116 secured to the rods. Each collar 116 has a projecting shoulder portion 118 (Fig. 2) which is engaged by a lug 120 secured to the cover in such a position that, when the cover is closed, the lug engages the shoulder portion to move the rods 110 and hence the bridge member 106 downward.

For opening the electrodes, that is for spreading the arms 68 so that the electrode assembly may receive the heel end portion of a shoe when the cover is raised, a slotted wedge separator 130 is supported upon screws 131 threaded in the bearing mounts 60, 62 for vertical sliding movement between the arms, the member 130 being biased upwardly by a spring 132 acting through a slidable rod 133 (Fig. 1). Adjacent to the point where the separator 130 passes between the arms of each electrode, the wedging member has a neck portion 136 (Figs. 2 and 3) and beneath it a portion 138 having sloping shoulders. The width of the neck portion 136 is sufficiently narrow to permit the arms 68 to swing in on opposite sides of the neck to bring the electrode elements against the side of the heel. Normally, however, the wedging member 130 is urged upwardly by the spring 132 and rod 133 into a position in which the shoulders engage the arms and force them apart as shown in Fig. 4. Downward movement of the bridge member 106 brings an adjustable set screw 140 down upon the top of the member 130, thereby moving it downwardly to release the electrodes to swing inwardly into operative position when the cover is closed. Threaded into the screws 131 are screws 142 (Fig. 4) which serve to support and conduct electric energy to a pair of auxiliary electrode elements 150 (Fig. 2).

In operation, with the oscillator circuits warmed up and ready to supply high-frequency energy to the electrodes, a lasted shoe having stiffener material incorporated into its upper at the heel portion is jacked on the post 100. The carriage 96 is then advanced until the heel end of the shoe engages the stop gage 104. The cover is then lowered to release the electrode elements 70 to swing inwardly into operative position against the shoe and at the same time the shoe is correctly positioned heightwise of the electrodes by the cover lugs 120. At the end of the operating cycle the cover is raised, the resulting upward movement of the bridge member 106 releasing the engagement between the shoe and the projection 108 and at the same time allowing the member 130 to rise and wedge open the electrodes to receive a further shoe.

Having thus described our invention, what we claim as new and desire to secure by Letters Patent of the United States is:

1. In apparatus for establishing an electric field in the end portion of a shoe, in combination, a support, a pair of electrode elements adapted to be operatively positioned on opposite sides of the end portion of a shoe, and a pair of bearings each supporting one of said elements for free swinging movement about a pivot axis, the pivot axes being convergent at a point which in normal operation, lies above the bearings, whereby the said elements are gravity-biased to swing toward the sides of an intervening shoe.

2. In apparatus for establishing an electric field in a portion of a workpiece, in combination, a pair of electrode elements adapted to be operatively positioned adjacent to opposite sides of said portion, carriers on which said elements are mounted for relative movement into and out of operative position, said carriers being biased normally to carry said elements into operative position, a cover adapted to enclose said electrode elements and movable between opened and closed positions, and a movable wedge separator having sloping shoulders, said separator being yieldingly biased into a position wherein said shoulders are interposed between the carriers to separate the elements, said separator being arranged to be transferred from said position by closing movement of the cover to allow said carriers to move to operative position.

3. In apparatus for establishing an electric field in the end portion of a shoe, in combination, a support, a pair of electrode elements adapted to be operatively positioned on opposite sides of the end portion of a shoe, and a pair of ball bearings disposed on said support with pivot axes convergent at an acute angle at a point which in normal operation lies above the bearings, each of said bearings supporting one of said elements for swinging movement about its pivot axis, whereby the said elements are gravity-biased gently toward the sides of an intervening shoe.

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