Jan. 30, 1962 C. O. KILHAM 3,018,756

FLUID APPLYING MACHINES

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Fig. 1

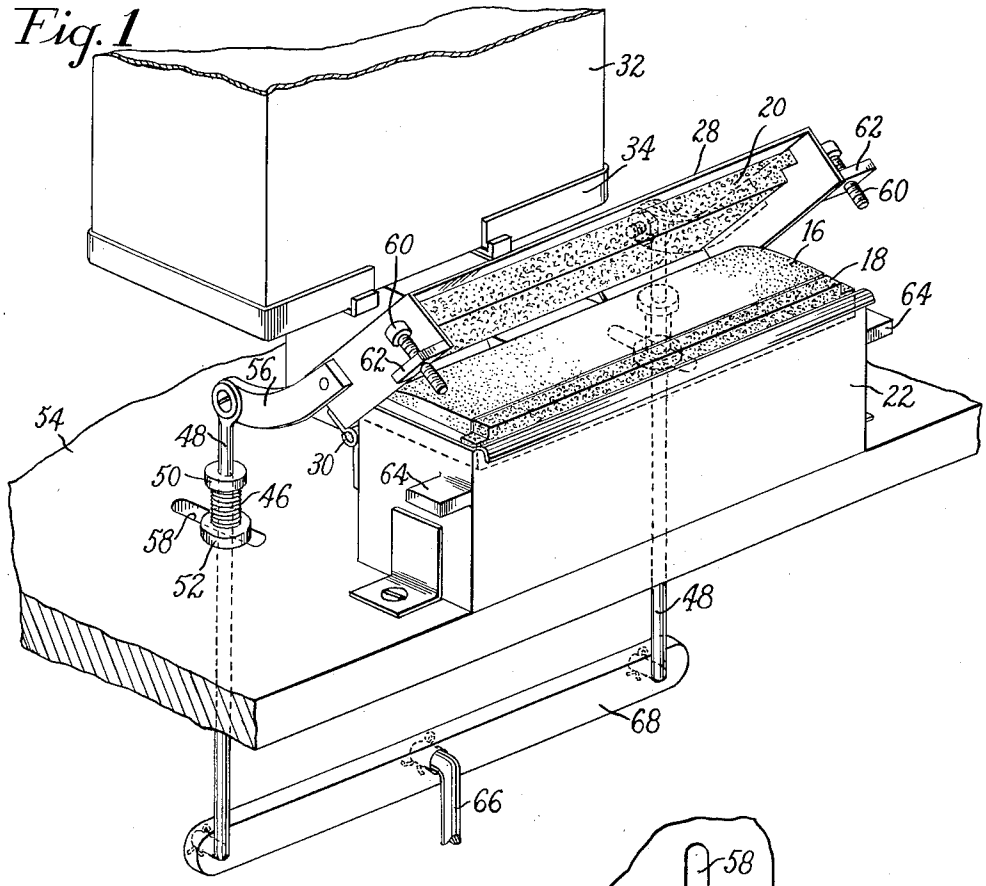
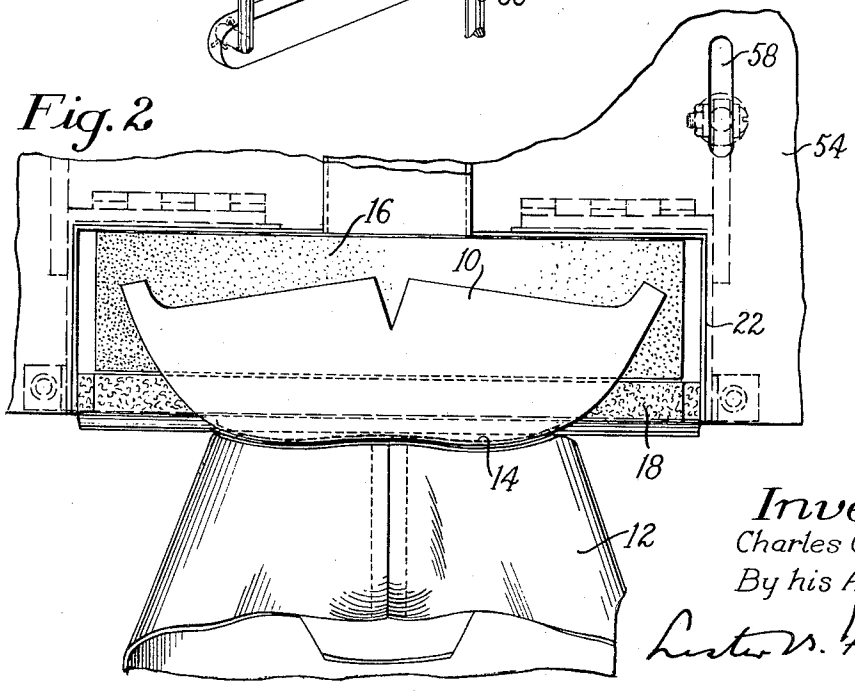


Fig. 2



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Fig. 3

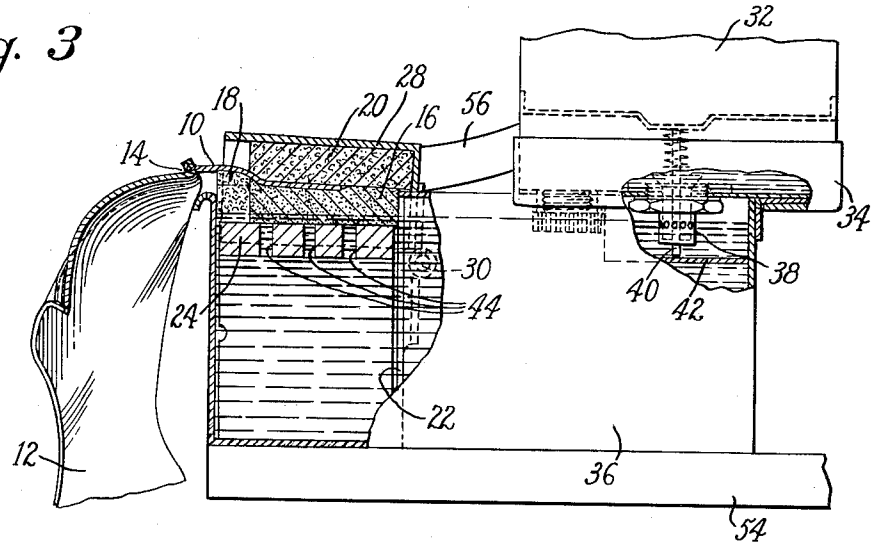
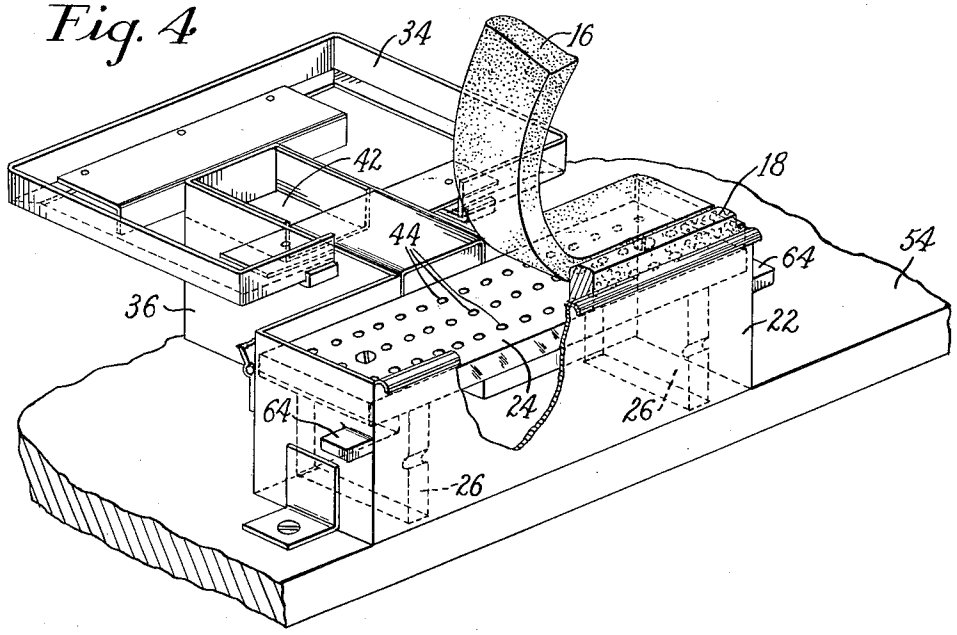


Fig. 4



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FLUID APPLYING MACHINES

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6 Claims. (Cl. 118—226)

This invention relates to machines for applying fluid to sheet material, and is herein illustrated in its application to machines in which fluid is applied to porous sheet material by suitable dispensing pads. In the accompanying drawings the invention is illustrated in its application to machines intended primarly for the application of solvent to an initially flaccid heel end stiffener or counter in order to cause the counter to become hard or stiff after its insertion into the heel end portion of the upper. It will be understood that the invention is not limited to the embodiment illustrated in the drawings but in its broadest aspects is applicable generally to machines for applying fluid to sheet material.

In stiffening the heel end portions of shoe uppers it is considered desirable to provide a marginal area adjacent to the top line which is resiliently flexible, at least to a degree sufficient to obviate abrasion of the heel of the wearer by penetration of the top edge at the extremity of the heel portion of the upper into the flesh at the back of the heel of the wearer during walking. In some types of shoe construction this result is achieved by so positioning the counter in the heel end portion of the upper that its top edge is spaced from the top edge of the upper sufficiently to leave a flexible margin of the upper above the counter. In other types of shoe construction this result is achieved, at least to a degree, by beveling the top margin of the counter to a thin edge in order to increase its flexibility.

It is an object of the present invention to provide the desired flexibility in the top margin at the extremity of the heel portion of the upper by providing the upper with a counter of the type which is initially flaccid and is rendered hard or stiff by the activation of a stiffening medium incorporated therein, said counter being characterized by the fact that its top marginal portion is stiffened only to a degree sufficient to give the upper stability while still affording sufficient flexibility to permit the desired flexing of the top margin at the heel end of the upper in the wear of the shoe.

To this end it is proposed to provide a machine or device which may be employed to apply to the top margin of a counter a small charge of fluid for effecting a partial or limited activation of a stiffening medium incorporated in the counter and to apply to the remainder of the counter a charge of activating fluid sufficient to activate the stiffening medium in that portion of the counter to a substantially greater degree.

With the above and other objects in view as will hereinafter appear the present invention contemplates the provision in a machine for applying fluid to porous sheet material of a first porous elastic dispensing pad which, in the illustrated organization, applies activating fluid, such for example as a ketone type of solvent, to all but the top margin of an initially flaccid counter impregnated with stiffening medium and a second porous elastic dispensing pad for applying activating fluid to the top margin. The two pads together define a total application area large enough to receive the largest size counter to be treated in the machine. The pads, which are of the type which dispense fluid upon compression thereof, are characterized by the fact that the first pad is a structure of high porosity capable of receiving and dispensing a major

charge of fluid per unit of application area while the second pad is a structure of low porosity capable of receiving and dispensing only a minor charge of fluid per unit of application area, the charge dispensed by the second pad being sufficient only to activate the stiffening medium in the top margin of the counter sufficiently to give said marginal portion a limited degree of stability while leaving it sufficiently flexible to permit the desired flexing of the top margin at the extremity of the heel end of the upper in the wear of the shoe. It will be understood that the first pad constitutes the greater part of the total application area of the dispensing pads, the second pad being only wide enough to treat the top marginal portion of the counter.

It has been found desirable in the manufacture of certain types of shoes, for example those types in which the counter itself provides the foot contacting surface at the heel end of the shoe upper, to stitch the top edge portion of the counter to the top edge portion of the shoe upper before applying activating fluid to the counter. In this type of construction it is usually desirable to obviate the flow of activating fluid into the stitches securing the counter to the upper. To this end the second dispensing pad is constructed and arranged to delineate a boundary of the fluid application area, for example by the formation of a well defined edge therein. In the operation of the machine the operator places the counter on the dispensing pads so that that edge of the second pad delineating the boundary of the application area is spaced from the stitches attaching the counter to the upper sufficiently to obviate the flow of activating fluid into said stitches.

In order to provide for the application of activating fluid to both surfaces of the counter a third dispensing pad is arranged opposite the first pad. This pad is charged with activating fluid by capillary attraction from the first pad when the pads are in mutual contact without a counter being positioned between them. Preferably, the third pad has a contacting surface of substantially the same dimensions as the first pad. The third pad is mounted in a carrier which is actuated first to bring the third pad into work engaging position and then to effect compression of the pads sufficient to effect dispensation of fluid therefrom into a counter positioned between the pads.

In order to insure the application to the top marginal portion of the counter of a relatively small charge of fluid, thereby to effect a limited activation of the stiffening medium, it is desirable to provide an organization whereby the flow of fluid from the first pad onto the second pad is prevented. To this end, the second pad is constructed to provide an upstanding portion providing a dam for restricting the flow of fluid from the first pad.

The invention will now be described with reference to the accompanying drawings and pointed out in the appended claims.

In the drawings,

FIG. 1 is a perspective view illustrating a machine or device embodying the features of the present invention;

FIG. 2 is a plan view illustrating a portion of the machine with a work piece mounted thereon;

FIG. 3 is a right side elevation of the machine, certain parts being shown in section on a plane common to the back line portion of a shoe upper the heel stiffener of which is positioned between the activating pads of the machine; and

FIG. 4 is a perspective view of the machine with certain parts removed therefrom and other parts broken away.

The invention is illustrated in the drawings as embodied

in a machine for activating heel stiffeners or counters impregnated with a stiffening material which is rendered effective by the application thereto of a suitable activator. Referring to FIG. 2, a counter **10**, preferably made of cotton sheeting, is secured to the top edge portion of a shoe upper **12** by stitches **14**. The shoe illustrated in the drawings has no lining in its heel portion, the counter being coated with flocking to provide a suitable foot contacting surface. The counter is impregnated with a compound which becomes effective upon the application to the counter of a solvent or activator to harden or stiffen the counter sufficiently to give the heel portion of the upper the required rigidity. The impregnating compound is preferably cellulose nitrate and the activator is a ketone type solvent.

In the illustrated machine the solvent or activator is applied to the counter by a highly porous elastic dispensing pad **16** on which the counter is positioned as shown in FIG. 2, a relatively dense elastic dispensing pad **18** positioned in front of, and in contiguous relation to, the pad **16** and a porous elastic dispensing pad **20** positioned above the pad **16** and arranged for movement relatively to the pad **16** first to bring the pad **20** into engagement with the pad **16** or with a counter positioned thereon and, second, to effect compression of both the pad **16** and the pad **20** thereby to effect dispensation of fluid therefrom into the counter.

As shown in FIG. 2, the pads **16** and **18** together define a total application area rectangular in shape with the pad **18** in front of the pad **16**. The pad **18**, which is relatively narrow, engages a portion of the counter proximate to the stitches **14** and the pad **16** engages in its entirety the portion of the counter extending downwardly from the portion treated by the pad **18**. All three pads are of the type which dispense fluid upon compression of the pad. The pad **16**, by virtue of its relatively high porosity, is capable of receiving, by capillary attraction, a relatively heavy charge of solvent per unit of application area, hereinafter referred to as a major charge, while the pad **18**, because of its relatively low porosity, is capable of receiving by capillary attraction, only a relatively light charge of solvent per unit of application area, hereinafter referred to as a minor charge. The pad **20** is preferably of somewhat greater density than the pad **16** while substantially more porous than the pad **18**. As shown in FIG. 3, the pad **18** extends above the pad **16** sufficiently to provide a dam or barrier preventing the flow of solvent from the pad **16** or the pad **20** onto the work engaging surface of the pad **18**.

The illustrated construction and arrangement of the pads **16**, **18** and **20** affords a relatively high saturation of that portion of the counter engaged by the pads **16** and **20** and a relatively low degree of saturation of that portion of the counter engaged by the pad **18**. By varying the degree of saturation by the solvent of different portions of the counter the degree of hardening or stiffening of the counter is varied so that the upper portion of the counter proximate to the top line of the upper is left relatively flexible but nevertheless sufficiently stable to maintain the shape of the adjacent portion of the upper while the lower portion of the counter is stiffened to a degree sufficient to render it substantially inflexible.

In order that the forward edge of the pad **18** may serve to delineate accurately the forward boundary of the application area the pad is so shaped that the upper or work contacting surface of the pad slopes downwardly toward the pad **16** and forms an acute angle with the vertical surface forming the forward extremity of the pad **16**.

In the illustrated organization the pad **16** is made of synthetic sponge material while the pad **18** is a relatively dense wool felt and the pad **20** is a relatively porous wool felt.

The pads **16** and **18** are mounted in the upper portion of a reservoir **22** (FIG. 4) on a perforated plate **24** supported by legs **26**. The pad **20** is cemented to the bottom surface of a cover **28** (FIG. 1) hinged at **30** on the rear panel of the reservoir **22**. The reservoir receives solvent from a container **32** (FIG. 3) mounted in inverted position on a flanged platform **34**. Solvent flows by gravity from the container into a passage communicating with the reservoir and provided by an angular extension **36** of the rear wall of the reservoir. Solvent in the reservoir is maintained at a constant level by a suitable valve **38** extending downwardly from the inverted container and maintained in an open position by the engagement of the valve stem **40** with a shelf **42** fixed in the extension **36**. The solvent flows freely through perforations **44** in the plate **24** and is maintained at a level such that the pads **16** and **18** are always partially immersed in the solvent. The cover **28** is normally held closed by springs **46** (FIG. 1) surrounding suitable rod-shaped links **48** and confined between collars **50** fixed to the links **48** and collars **52** slidably mounted on the links and supported on the upper surface of a bench or table **54**. At its upper end each link **48** is pivoted to the rear end portion of an arcuate arm **56** fixed to the cover **28**. Each link **48** extends downwardly through a slot **58** formed in the bench. The closed position of the cover is adjustably determined by the engagement of screws **60** mounted in ears **62** projecting in opposite directions from the cover **28** with ears **64** projecting in opposite directions from the end walls respectively of the reservoir **22**. For swinging the cover **28** into its open position shown in FIG. 1 to permit the mounting of a counter on the pads **16** and **18** a treadle (not shown) is connected by means including a link **66** to a crossbar **68** pivoted at its ends to the lower extremities of the links **48**.

In the operation of the machine the counter **10** is swung outwardly from the upper **12** into its position shown in FIGS. 2 and 3 and positioned on the pads **16** and **18**, the position of the counter with relation to the forward edge of the pad **18** being determined by bringing the top edge of the upper into contacting relation to the forward wall of the reservoir **22**. Thereupon the cover **28** is caused to move downwardly into its position shown in FIG. 3. The screws **60** are so adjusted that the pads **16** and **20** are compressed to the degree required to effect a proper dispensation of fluid into the counter and to effect sufficient pressure of the inner surface of the counter against the pad **20** to effect the required dispensation of solution upon the upper portion of the counter. The pressure of the inner surface of the counter against the pad **18** is determined largely by the downward force exerted on the upper **12** by the operator.

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

1. In a machine of the type in which fluid from a reservoir is applied to porous sheet material by pressing the sheet material against dispensing pads, a first porous elastic dispensing pad and a second such pad, the two pads together defining a total application area, said pads being of the type characterized by the fact that dispensation of fluid therefrom is effected by compression, the first pad being a structure of high porosity capable of receiving by capillary attraction a major charge of fluid per unit of application area and the second pad being a structure of low porosity capable of receiving by capillary attraction only a minor charge of fluid per unit of application area.

2. In combination, a first porous elastic dispensing pad and a second such pad, the two pads together defining a total application area, said pads being of the type characterized by the fact that dispensation of fluid therefrom is effected by compression, the first pad being capable of receiving by capillary attraction a major charge of fluid per unit of application area and the second pad being capable of receiving by capillary attraction only a minor charge of fluid per unit of application area, said first pad constituting the greater part of the application area and

said second pad constituting the lesser part of the application area.

3. In a machine of the type in which fluid from a reservoir is applied to porous sheet material by pressing the sheet material against dispensing pads, a first porous elastic dispensing pad and a second such pad, the two pads together defining a total application area, said pads being of the type characterized by the fact that dispensation of fluid therefrom is effected by compression, the first pad being capable of receiving by capillary attraction a major charge of fluid per unit of application area and the second pad being capable of receiving by capillary attraction only a minor charge of fluid per unit of application area, said second pad delineating a boundary of the application area.

4. In a machine of the type in which fluid from a reservoir is applied to porous sheet material by pressing the sheet material against dispensing pads, a first porous elastic dispensing pad, a second such pad, the two pads together defining a total application area, said pads being of the type characterized by the fact that dispensation of fluid therefrom is effected by compression, the first pad being capable of receiving by capillary attraction a major charge of fluid per unit of application area and the second pad being capable of receiving by capillary attraction only a minor charge of fluid per unit of application area, and a third dispensing pad of the same type as the other two arranged to receive by capillary attraction from the first pad a charge of fluid.

5. In a machine of the type in which fluid from a reservoir is applied to porous sheet material by pressing the sheet material against dispensing pads, a first porous elastic dispensing pad, a second such pad, the two pads together defining a total application area, said pads being of the type characterized by the fact that dispensation of fluid

therefrom is effected by compression, the first pad being capable of receiving by capillary attraction a major charge of fluid per unit of application area and the second pad being capable of receiving by capillary attraction only a minor charge of fluid per unit of application area, and a third pad of the same type as the other two arranged to receive by capillary attraction from the first pad a charge of fluid, said third pad having a contacting surface of substantially the same dimensions as the first pad.

6. In a machine of the type in which fluid from a reservoir is applied to porous sheet material by pressing the sheet material against dispensing pads, a first porous elastic dispensing pad, a reservoir in which the pad is mounted, a second porous elastic dispensing pad mounted in the reservoir in edge-to-edge registration with the first pad, a third porous elastic dispensing pad, and a presser member in which the third pad is mounted, said presser member being mounted for movement to bring the third pad into face-to-face contact with the first pad, said second pad being offset horizontally from the third pad when the third pad is in contact with the first pad, said second pad being characterized by an upstanding portion providing a dam for restricting the flow of fluid from the other two pads.

References Cited in the file of this patent

UNITED STATES PATENTS

379,793	Laughton	Mar. 20, 1888
1,027,204	Hammond	May 21, 1912
1,633,015	Harris	June 21, 1927
1,712,600	Westphal	May 14, 1929
1,871,998	Jennings	Aug. 16, 1932
2,500,066	Gaunt	Mar. 7, 1950
2,827,012	Kesling	Mar. 18, 1958