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CONFIGURABLE PLATEN FOR LABEL APPLYING MACHINES

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Fig. 1

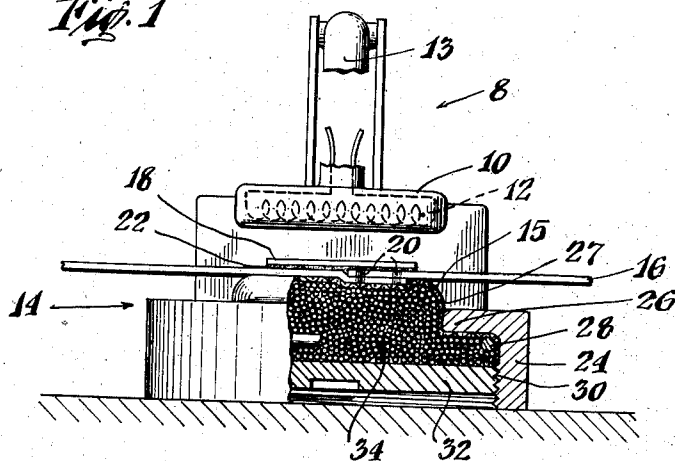


Fig. 2

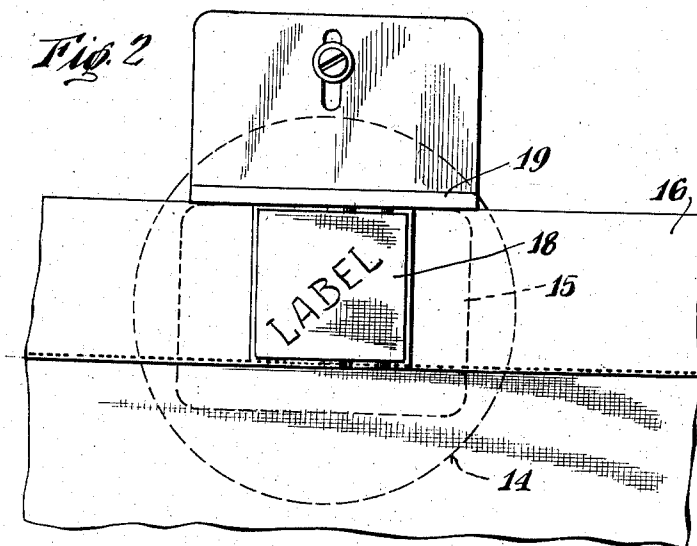


Fig. 4

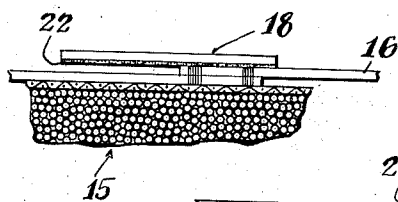
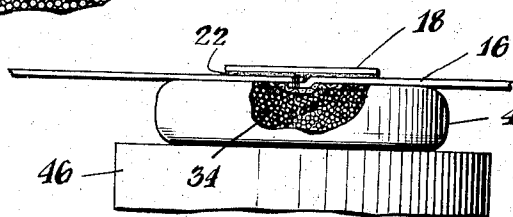


Fig. 3



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CONFIGURABLE PLATEN FOR LABEL
APPLYING MACHINESThomas H. Miller, Wilmington, Del., assignor to
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This invention relates to an improved platen for use in applying a flexible sheet or strip material to a surface of irregular contour or to material of uneven thickness and causing uniform and firm adherence of the two materials throughout the extent of their opposed surfaces by means of an interposed adhesive. Among the many uses to which my platen may be put, it is particularly adapted for use in applying adhesive labels or other flexible strip or sheet material across the seams or other areas of uneven thickness of garments and other articles made of fabric or other soft or flexible materials.

The invention further includes an improved method involving the use of my platen in bringing about uniform adherence between two materials of extended surface areas, at least one of which is flexible and one or both of which carries an adhesive coating or is rendered adherent upon the application of heat or pressure, and more particularly wherein one or both of the materials presents a surface of irregular contour or is of unequal thickness in a localized area thereof. A more particular embodiment of the method has to do with the application of adhesive labels to surfaces of irregular contour or to materials of uneven thickness, such as seamed fabrics and garments as well as various laminated sheet materials built up of laminations of a different number or thickness in different portions of the area to which the label is to be applied.

My invention still further includes as an improvement in a labeling machine a novel combination of parts including my improved platen.

For purposes of illustration, I will describe the invention with particular reference to its application in solving certain problems encountered in attaching labels to garments, but it will be understood, as pointed out further hereinafter, that the invention is of much more general application.

In the garment industry it is a more or less general practice to attach a label to each garment. According to one method which is coming into general use, the labels are attached to the garment by means of a thermoadhesive which is applied to the back of the label usually before the label is printed, as disclosed in the United States Patent to Lawrence No. 2,096,750. The adhesive-coated label is laid upon the garment and caused to be attached thereto by means of a heated iron which presses the label against the garment while the latter is disposed upon a suitable supporting surface. Under the heat of the iron and the pressure applied, the adhesive will soften

and become tacky, enabling it to be forced into the surfaces of the fabric and to promote a bond between the label and the fabric.

The labels may be applied either by use of a hand iron or a machine which includes the heated iron, a garment supporting station arranged in proximity thereto and means for bringing the iron into pressing relation to the fabric in stated or determined intervals as desired. One type of machine now used commercially also includes a magazine for feeding the labels to or adjacent the position on the garment where they are to be attached.

In applying labels to certain types of garments, as for example to the waist bands of men's shorts and other under-garments, it is customary to apply the label across a seam where the ends of the band come together and overlap. When adhesive labels are applied in this manner difficulty is experienced in obtaining a uniform and permanent adherence of the label throughout the area of the label and particularly in the areas adjacent but at both sides of the seam. As a consequence of the lack of complete and uniform adherence of the label adjacent the seam, there is a tendency for the label to become dislodged in laundering or at least lose the desired smooth appearance on the garment.

With a view to overcoming this difficulty, various means have been proposed to insure that the label will be firmly attached adjacent and at each side of the seam despite the difference in thickness of the garment at the seam. One means that has been used has consisted of a platen made of steel and provided with a recess or opening of the approximate width, depth and length of the seam with the idea of permitting the seam to be forced into the opening down to the level of the fabric on the top side to which the label is attached. This form of platen, however, has several objections among which are the extreme care required in disposing the garment on the platen so that the seam registers exactly and evenly with the recess. This, of course, slows down the operation. Furthermore, the seams are not always of the same width and thickness so that it is practically impossible to provide one platen that will compensate for all of the variations present in the mill run of seams. Moreover, it is often desired to apply the labels across curved or biased seams of different curvatures, and, unless the platen is similarly curved and closely conforms to the width of the seam, difficulty is experienced with a metal platen in attaching a label to the fabric imme-

diately adjacent to the seam. A platen of a fixed contour and whether straight or curved requires careful registration by the operator and this slows down and retards the application of the labels which is an undesirable factor in mass production.

I have found that these difficulties may be overcome by providing a self-supporting surface or platen of novel characteristics which I shall hereinafter sometimes refer to as a "self-adjusting" or "configurable" platen. More particularly, I have found that if a shiftable medium, having a suitable range of properties as respects density, flowability and particle size or as respects ability to adjust the various parts of a body of the medium to different positions upon the application of pressure to a confined body of the same, is confined in a suitable receptacle which includes a flexible or pliable member serving to close the receptacle on the one hand and to confine the shiftable medium against unrestrained flow on the other hand, the resulting assembly may be used as a platen or pad for supporting the garment and transmitting the pressures applied to the label and fabric uniformly and evenly over the entire overlapping area of such label and fabric. More particularly, I have found that certain granular media such as fine shot, as well as other materials of like form and particle size, behave in the desired manner above described when they are confined in a fabric bag or the like which is shaped to form a pad. A similar result is obtained when the sides and bottom of the pad or platen structure are made of a solid or firm material and the top of the pad is formed of a sheet of soft pliable material which may close the open side of the pad in the form of a diaphragm.

I have found further that the extent to which the shiftable material is closely confined will affect the sharpness of the template outline that will be formed in the pad by the garment seam or other irregularity under the influence of the pressure of the iron, and that, therefore, it is feasible to vary the pressure applied on the shiftable contents of the pad and by so doing to insure the uniform and even pressure contact of the label and garment when dealing with different types and thicknesses of seams or localized irregularities. My invention also includes certain structural features which permit of ready use to this end, and also features which enable my self-adjusting platen to be readily associated with the elements of label applying machines that are presently used.

It is one of the principal objects of my invention to provide a configurable platen that has self-adjusting characteristics which enable it to adjust or compensate for the differences in thickness of the garment and label or other association of fabric or other sheet material in laminated relationship, regardless of the curvature or contour of the seam or other irregularity, and to cooperate with the heated iron in distributing the forces applied by means of the iron, uniformly throughout the overlapping surfaces of the label and garment irrespective of whether or not the juxtaposed surfaces of the label and garment are flat as in the general area of the label or are associated at varying angles as at the line of the seam.

It is a further object of my invention to provide a configurable platen which is of simple and sturdy construction and easily adjustable to vary the degree of tautness of the working surface

thereof, and likewise to vary the degree of pressure normally applied on the shiftable material confined in the template pad.

It is a further object of my invention to provide an improved label applying machine which includes my new self-adjusting platen in combination with heating and pressure applying means, the platen having a pliable working surface adapted to cooperate with a pressure applying means to effect uniform distribution of pressure to fabric and label surfaces disposed therebetween throughout the area of overlap of the label and garment or other article or material irrespective of any irregularities in thickness of the garment or material and the label due to a seam or other structure introducing an irregular contour or differing thickness.

It is a further object of my invention to provide an improvement in a label applying machine which includes the combination of my self-adjusting platen with a heated pressure applying means adapted to cooperate with the template to apply heat and distribute pressure uniformly over the surfaces of a fabric or other flexible material disposed between the template and the pressure applying means.

It is still a further object of my invention to provide a self-adjusting pad which is of simple and sturdy construction and which may be easily adjusted to vary the tautness of the working surface and also to vary the sharpness of outline of the self-adjusting area automatically defined therein to adjust for differences in contour or thickness of sheet or other extended surfaced material that is brought into pressure contact with the pad by the pressure applying means.

My invention has for a further object to provide an improved method of adhering a flexible sheet material to an extended surface having localized irregularities or contours therein by application of pressure or heat and pressure uniformly over the opposed surfaces.

My invention has for a further object to provide an improved method of applying adhesive labels to garments and other articles of manufacture and particularly an improvement which insures the uniform and firm adherence of the label to seams and other surfaces of irregular contour or thickness.

Other objects and advantages of my invention will appear from the appended detailed description taken in connection with the accompanying drawing, in which:

Figure 1 is a diagrammatical view in elevation of a label applying machine with parts broken away to show my self-adjusting platen in operative relation therewith and with a label superposed upon a fabric seam in the position assumed at the end of the pressing operation;

Figure 2 is a plan view showing the platen and the positioning in operative relation thereto of a seamed fabric and a label in position to be applied over the seam;

Figure 3 is a view in elevation of a modified form of platen with parts broken away and showing a label and seamed fabric section thereon in the position taken at the end of the pressure-applying step; and

Figure 4 is a detailed view illustrating the relation of the label to the seamed fabric at the time the label is laid on the fabric and before the assembly has been pressed between a heated iron and the platen.

Referring to Figs. 1 and 2 of the drawing, a label applying machine 8 is shown diagram-

matically as including a heated iron 10 having a heating element 12 and an actuating arm 13 by which the iron is reciprocated toward and away from the working surface 15 of a platen 14 made in accordance to the principles of my invention. In operation a portion 16 of a garment to which a label 18 is to be attached is placed against a stop 19 in a position overlying the working surface 15 of the template and a label deposited thereon directly beneath the iron 10. The label 18 is disposed so that the thermoadhesive coating 22 is adjacent the fabric 16. As the heated iron 10 is pressed toward the platen 14 the fabric 16 is forced against the working surface 15 and the temperature of the adhesive 22 elevated to render it tacky for forceful interspersion into the fabric structure of the garment.

Where the working surface is of a pliable character in accordance with this invention, irregularities in the thickness and contour of the fabric 16 are impressed into the working surface of the platen so as to render the upper surface on the fabric substantially flat for the uniform application of the label. The yielding, self-forming and pressure exerting characteristics of the pliable working surface urge the thinner portions of fabric immediately adjacent those portions of greater thickness, such as the seams 20, upwardly with a pressure substantially equal to the force exerted on the thicker portions whereby a uniform adherence of the label is effected throughout the entire area thereof.

The form of platen illustrated in Figs. 1 and 2 comprises an annularly shaped member or receptacle 24 having an inwardly extended flange 26 to provide an aperture of the shape and size desired for a working surface. As shown in Fig. 2, the shape of the working surface of this form is rectangular. It is to be understood, however, that various shapes and areas of working surfaces may be provided, depending upon the shape and area of the labels to be attached.

The working surface 15 is formed by a sheet of soft pliable material 27 which may be either of fabric, chamois skin or other suitable material which is flexible but substantially non-expandable. The sheet of material is anchored at its marginal edges adjacent the member 24 beneath the flange 26 by a spring 28 or other suitable means. The inner surface of the member 24 is provided below the flange 26 with threads 30 for cooperation with a threaded plate 32. The member 24, sheet 27 and plate 32 thus define a chamber, the capacity of which is rendered adjustable by changing the position of the plate 32 with respect to the member 24. Contained in this chamber is a substantially non-compressible medium 34 which is readily shiftable or flowable to provide a yieldable, pressure exerting backing for the diaphragm formed by the sheet 27. By adjusting the size of the chamber the diaphragm is correspondingly loosened or tightened and the free movement of the medium is thus increased or decreased.

It is important that the medium selected be substantially non-compressible and yet sufficiently shiftable or flowable to provide a pliable working surface. Where solids are selected as a medium, they should be of small size and substantially spherular or granular so as to present readily shiftable or flowable characteristics. Relatively smooth surfaced granular and substantially spherular materials, such as bird shot, i. e., shot of about No. 10 size, small ball bearings, glass beads, etc., satisfactorily provide these

characteristics. Various liquids, for example, mercury, which are substantially noncompressible, may also be used as a satisfactory backing medium.

While the receptacle shown in Figs. 1 and 2 is made of rigid material, except for the diaphragm, it may be made entirely of flexible, substantially non-stretchable material. Such a platen is shown in Fig. 3, wherein 44 indicates a closely woven fabric bag filled with a suitable quantity of shot or other spherular bodies 34. The bag 44 is so shaped as to form a flat pad which, when it rests on a suitable supporting surface 46, serves to support the seamed garment or other fabric 16 and a superposed label 18 in position to be pressed together by means of a heated iron or other pressure or heat and pressure-applying means. The confined medium 34 when subjected to pressure distributes the pressure substantially equally in all directions, whereby the portions in and about the seam of a fabric pressed against the receptacle receive evenly distributed pressure so that the entire area to which a label is applied is assured of being urged into effective attachment with the label. The label 18 and seamed fabric 16 are shown in Fig. 3 in the position taken as a result of the application of pressure from an iron, not shown.

In Fig. 4 the label 18 and the seamed fabric are shown in the position they occupy when laid on the platen and before applying pressure. By comparing Figs. 3 and 4 it will be seen that under the pressure of the iron the overlap or seamed portion of the fabric is depressed into the face of the platen upon application of pressure from an iron, thus bringing the opposed surfaces of the label and the fabric into continuous contact in a single plane.

In each of the forms illustrated, it will be readily apparent that the medium used adjacent the membrane is capable of withstanding pressure from the iron 10 while at the same time providing for the reception of any irregularities in the contour and thickness of the fabric disposed between the iron and the working surface of the platen.

While the platen has been described as the stationary member which supports the fabric and label, it will be understood that it is within the scope of the invention to interchange the elements and to mount the platen for movement to and away from a supporting surface, such as 46, upon which the label and fabric assembly are placed. In this arrangement, as well as in the forms illustrated in the drawings, pressure is applied uniformly and effectively along all of the marginal edges of the label, as well as across the seam when the label is being applied to seamed fabrics. In this modified arrangement, heat may be supplied through the support 46 or through the platen, if desired.

As indicated in the statement of the objects of the invention, it is not limited to use in attaching labels of sheet materials to another surface through the medium of a thermoadhesive. The principles of the invention are likewise applicable in applying labels by pressure alone, without heating, in which case any of the various commonly known adhesives that do not require heat may be used. The adhesive may be applied to the label or other sheet material that is to be joined to the base material either before or as a part of the laminating or label-applying operation. Alternatively, the base material may be coated with a liquid adhesive in the localized

area to which the label or other lamination is to be applied, whereupon the label will be applied thereto and pressed into adhering relation.

It is also to be understood that the label or the surface to which it is to be applied may be formed of a material that is softened or otherwise rendered adherent upon the application of heat and pressure, in which case the use of an adhesive to bring about the union of the two surfaces is not required.

While the invention has been described with particular reference to the application of labels to seamed garments and fabrics, it is to be understood that this is only one of many applications of the principle of the invention. For example, it has been found that the invention is particularly adapted for use in applying a reinforcing fabric strip around eyelets and other openings in various textile articles or fabrics. A specific example of such an application is found in the type of towel that is provided with a grommet received in an eyelet near one end of the towel, and which serves to receive a retaining rod or bail for the purpose of retaining the towel so that it may not be carried away by the user. Another specific example of such an application is found in the application of reinforcing strips or gores at various places on undergarments or other fabric articles of manufacture. Where the term "label" is used in the appended claims it is to be understood as used in a general sense to include besides labels per se, reinforcing strips, gores and similar fabric and sheet material that is laminated to a base material.

While I have shown and described different forms illustrating my invention and specified several different media applicable for use with my configurable platen, many other modifications in construction and choice of materials as working media are possible. It is to be understood, therefore, that the forms illustrated and described are intended to be illustrative of the invention only and not as limiting the scope of the appended claims.

I claim:

1. A self-adjusting platen adapted for use in applying a flexible sheet material across a seam or a similar irregular surface of a base material, which comprises a receptacle, a body of a packing resistant, readily flowable medium confined in said receptacle by an extended pliable member normally in contact with said medium on one side and on the other side providing a yielding surface adapted when pressed against a seam or a similar irregular surface of a base material to readily conform to the irregularities thereof and substantially evenly distribute the applied pressure throughout the confined areas of said sheet material and said base material.

2. A platen adapted for use in applying adhesive labels across a seam of a garment or a similar irregular surface comprising a body of a smooth shot-like medium held in confined shiftable position by a pliable member which cooperates therewith to form a yielding, self-adjusting, work-supporting surface.

3. A platen adapted for use in applying adhesive labels over a seam of a garment or a similar irregular surface comprising a body of smooth surfaces granular, readily shiftable material held in confined shiftable position by a pliable member which cooperates therewith to form a yielding, self-adjusting, work-supporting surface.

4. A platen adapted for use in applying ad-

hesive labels over a seam of a garment or a similar irregular surface comprising a multitude of smooth spherular bodies held in confined shiftable position by a pliable member which cooperates therewith to form a yielding, self-adjusting, work-supporting surface.

5. A platen adapted for use in applying labels over a seam of a garment or a similar irregular surface which comprises a receptacle filled with a body of smooth spherular material, said material being held in a confined but shiftable position in said receptacle by a flexible diaphragm serving as a closure for said receptacle and as a pliable work-supporting surface.

6. A platen adapted for use in applying labels over a seam of a garment or a similar irregular surface which comprises a receptacle filled with a body of spherular material, said material being held in a confined but shiftable position in said receptacle by a flexible diaphragm serving as a closure for said receptacle and as a pliable work-supporting surface, and means for adjusting the tautness of said diaphragm.

7. A platen adapted for use in applying labels over a seam of a garment or a similar irregular surface which comprises a receptacle filled with a body of spherular material, and having an opening in one side thereof, a flexible diaphragm extending across and closing said opening, said diaphragm also forming a pliable work-supporting surface, and means for adjusting the size of said receptacle to vary the pressure of the confined spherular bodies on said diaphragm.

8. In a machine for applying thermoadhesive labels to fabric and the like including two members between which the fabric and a label are subjected to heat and pressure to effect adhesion of the label to the fabric; said members being characterized in that one of the members provides a firm surface and the other of said members provides a yielding surface backed by a multitude of smooth spherular bodies which conforms readily to irregularities presented thereto and substantially evenly distributes pressure throughout the area of the label.

9. In a machine for applying thermoadhesive labels to fabric and the like including two members between which the fabric and a label are subjected to heat and pressure to effect adhesion of the label to the fabric; said members being characterized in that one of the members provides a firm surface and the other of said members provides a self-adjusting surface backed by a body of smooth shot-like medium adapted to conform to irregularities in the thickness of the fabric and substantially evenly distributes pressure applied to said surface throughout the area of contact thereof with said fabric and label.

10. In a machine for applying thermoadhesive labels to fabric and the like including two members between which the fabric and a label are subjected to heat and pressure to effect adhesion of the label to the fabric; said members being characterized in that one of the members provides a substantially flat, heated surface and the other of said members provides a self-adjusting surface backed by a smooth surfaced readily shiftable material adapted to conform to irregularities in the thickness of the fabric and substantially evenly distributes pressure applied to said surface throughout the area of contact thereof with said fabric and label.

11. A platen adapted for use in applying labels over a seam of a garment or a similar irregular

surface, which comprises a receptacle filled with a readily flowable medium, a flexible diaphragm arranged as a closure for said receptacle to hold said medium in a confined but shiftable position in the receptacle, said diaphragm serving as a pliable work supporting surface backed by said medium, and means for adjusting the tautness of said diaphragm.

12. In a machine for applying thermoadhesive labels to fabric and the like including two members between which the fabric and a label are

subjected to heat and pressure to effect adhesion of the label to the fabric; said members being characterized in that one of the members provides a firm surface and the other of said members provides a yielding surface backed by a body of packing resistant readily flowable medium which conforms readily to irregularities presented thereto and substantially evenly distributes pressure throughout the area of the label.

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