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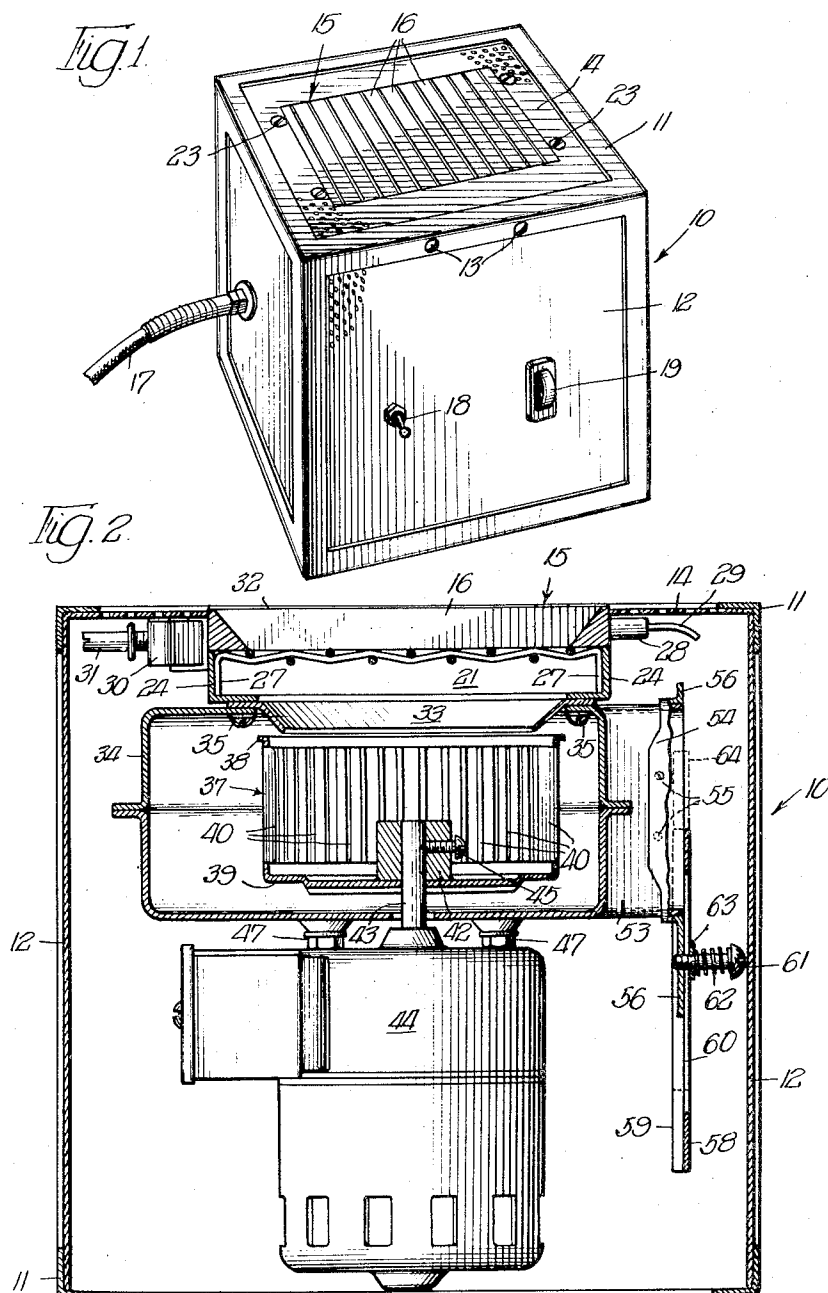
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LABEL ACTIVATOR

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LABEL ACTIVATOR

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The present invention relates generally to a label activating device for use with labels containing coatings of thermo-activated adhesives. More specifically the present invention is directed to a label activating device utilizing a grid-type heating element associated with air-inducing means capable of retaining the label in position on the heating element during activation thereof.

Among the types of heating devices used in activating thermo-activated adhesive coatings on labels are those of the hot-plate variety. Such devices make use of a solid heating surface and a suitable heating unit. In utilizing labels coated with thermo-activated adhesives it is desired to position the label on a heating surface with its adhesive coating facing upwardly, activating the adhesive coating by allowing the label to dwell on the heated surface for a sufficient length of time and introducing a wrapped product into contact with the activated adhesive coating, thereby causing adherence between the label and the wrapping, ultimately resulting in a finished packaged product. Difficulty has been experienced in this type of operation where a solid heating surface is utilized due to the tendency of the label to curl upon the application of heat. Another difficulty experienced is that of attempting to regulate the dwell time necessary to properly activate the adhesive and seal the label to the wrapper. This latter problem is normally overcome merely by the increased experience and ability of the operator to correctly judge the proper time necessary to activate the coating. It has also been found that in bringing the packaged product into contact with the label, the packaged material either directly contacts the heated surface of the device or is sufficiently heated by the radiation of the device to be damaged, particularly in the instance where heat-sensitive films are used. This latter difficulty requires considerable care on the part of the operator in bringing the product wrapped in heat-sensitive film into contact with the activated label.

It is therefore an object of the present invention to provide an improved label activating device having means incorporated therein to prevent curling of the label during the application of heat along with constant temperature controlling means to remove guesswork from the proper determination of dwell time.

A further object is to provide an improved label activating device which will not adversely affect heat-sensitive wrapping material during the contact of the wrapping material with the activated label and with some portion of the grid.

Still a further object is to provide an improved label activating device incorporating air-induction means in combination with a grid-type heating surface and having additional means for preventing the labels or portions thereof from inadvertently slipping down between the grids into contact with the air-induction means.

Another object of the present invention is to provide an improved label activating device of portable construction, greater operating efficiency and relatively low maintenance and manufacturing costs.

Further objects not specifically set forth will become

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apparent from the following detailed description of the invention.

In the drawings:

Fig. 1 is an isometric view of an assembled device of the present invention;

Fig. 2 is a vertical section of the device

Fig. 3 is a partial vertical section of the device, taken at right angles to the vertical section of Fig. 2; and

Fig. 4 is a sectional plan view of the device taken along line 4—4 of Fig. 3.

Referring in particular to Fig. 1, the assembled device, as shown therein, is designated by the general reference numeral 10. The device includes a frame 11 having perforated side panels 12 associated therewith, and a perforated top panel 14 which has incorporated therein a grid or plate 15 composed of grid members or bars 16.

The device, as shown, consists of a rectangularly shaped portable casing but can, of course, be of any desired shape. The particular construction described allows the label activating unit to be utilized in various positions; for example, the device can be used in an upright position with the grid 15 at the top, as shown in Fig. 1, or can be positioned on one of its sides, thereby allowing the grid 15 to be vertically placed, or can be inverted.

One of the side panels 12 has extending therethrough an electrical inlet 17 of any suitable construction. The front side panel 12 of Fig. 1 has mounted thereon a switch 18 and operating light 19. The switch 18 sets into operation all of the various components of the unit while the light 19 indicates such operation. The heat conductive means or grid 15, as shown, is relatively flat and contains grid members 16 which are spaced so as to present a slotted heating surface. The preferred type of grid structure makes use of a one-piece unit, however, individual detachable grid members can be suitably provided if so desired.

Referring to Figs. 2 and 3, the grid 15 is supported by a grid housing 21 which, as in Fig. 3, contains end flanges 22 attached to the under-surface of the top panel 14 by screws 23 (see Fig. 1). Sides 24 of the grid housing 21 are low as compared to the ends of the grid housing and, in turn, support the grid 15 along the top surfaces thereof. The sides 24 can be seen clearly in Fig. 2. Positioned within the grid housing 21 is a screen 26 having the ends of the screen elements 27 bent along the sides thereof to properly position the screen 26 within the grid housing 21. The grid members 16 each contain imbedded therein and extending longitudinally thereof an electrical resistance heating cartridge 28 to supply the requisite heat to the grid for activating the labels. The cartridges 28 include electrical inlets 29, shown in Fig. 2, and a thermostat control 30. Any number of thermostat controls can be utilized, depending on the type of control desired. Each of such controls contains an adjusting screw 31 which can be used to properly regulate the degree of temperature desired in the grid 15. Access to the adjusting screws can be gained through holes 13 in frame 11 (see Fig. 1). It is preferred that the grid 15 be coated with a suitable material capable of withstanding the temperatures utilized and alleviating sticking between the label and the grid surface. A coating that has been found desirable is a polymer of tetrafluoroethylene which is sold under the trade name of "Teflon." Such a coating is designated in Figs. 2 and 3 by the reference numeral 32. This coating may be applied by a suitable spraying operation and has been found to exhibit long wearing properties when present in a thickness of approximately three or four mils. If desired, a sheet or jacket of material such as "Teflon" can be suitably placed on top of the grid 15 for the same purpose as the coating 32 thereby alleviating the coating.

The grid housing 21 is open at the bottom central portion and is in contact with baffle plate 33 which, in turn,

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extends into a vacuum unit housing 34. The vacuum unit housing 34 and baffle plate 33 are suitably attached to the grid housing 21 by screws 35 seen in Fig. 2. Mounted within the vacuum unit housing 34 is a vacuum-type fan designated by the general reference numeral 37, which is of the squirrel cage variety. The suction fan 37 includes an upper baffle 38 and bottom plate 39 between which are positioned a plurality of vanes 40. Positioned on the bottom plate 39 is a fan core 42 into which is inserted an output shaft 43 extending from an electric motor 44 mounted below the vacuum unit housing 34. The output shaft 43 is suitably detained from rotation within core 42 by a screw 45. The electric motor 44 is suitably mounted to the bottom outer surface of the fan housing 34 by mounting means 47. The fan vanes 40 are suitably positioned to draw air inwardly into the fan housing through the grid 15 and subsequently exhaust the air through one of the perforated sides 12 of the unit. By this operation, the label, when placed upon the grid, coated side up, is held firmly against the grid 15 by suction, thereby preventing curling of the label during activation. Some of the labels processed are formed from extremely thin material and, due to the slotted nature of the grid 15, the induced air is sometimes capable of drawing an edge of the label between the grid members 16. The screen 26 operates to restrict the extent of the label's movement through the grid 15, thereby alleviating the possibility of the label being drawn into the fan housing 34 and interfering with the operation of the fan 37. In proper operation of the device, the drawing of a label between the grid members 16 is infrequent. However, the screen 26 has great utility in guarding against the possible undesirable results of such a contingency. In the event that some portion of a label is accidentally drawn down between the grid members 16, the screen 26 stops further movement of the label into the device.

The air induced through the grid 15 by the fan 37 has an additional function of cooling the grid members 16 which are out of contact with the label being activated so that the temperature of these grid members is sufficiently reduced to alleviate heat damage to the heat-sensitive wrapping material brought into contact therewith when the package is applied to the activated adhesive coating of the label. This particular feature has great utility in view of the fact that the majority of wrapping material used commercially is of the heat-sensitive variety. It is also almost impossible to guard against contact between the wrapping material and the heated grid during the application of the label to the package. The induced current of air does not cool the grid members 16, which are immediately below the label being activated, due to the action of the label in cutting off the flow of air through that particular section of the grid. The suction supplied by the fan 37 is also capable of properly drawing a label into suitable position for activation where a label dispensing means is utilized to automatically deliver labels to the grid.

Baffle plate 33 aids in the control of the movement of air through fan housing 34. Due to its shape, baffle plate 33 cooperates with baffle 38 of the fan 37 to insure the induction of air solely through grid 15 and to alleviate recirculation of air within fan housing 34. Such an arrangement provides greater efficiency to the operation of fan 37 and greatly aids in controlling the movement of air within the fan housing 34.

Fig. 4 better illustrates the manner in which the current of induced air is handled by the device. In considering Fig. 4 with reference to Figs. 2 and 3, it can be seen that the fan housing 34 is provided with a central top intake into which is inserted the baffle plate 33 and also is provided with a side discharge portion 53. An outlet fitting 54 is fixedly attached to the discharge outlet 53 by suitable indents 55 shown in Fig. 2. The outlet fitting 54 consists of flanges 56 which are partly cut away in Figs. 2 and 3 to better illustrate the design of the fan

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housing 34. Attached to the flanges 56 is a vertically slidable plate 58 which contains right angled lips 59 on both sides thereof to fix the plate 58 to the flanges 56 against separation therefrom by horizontal movement and yet allow vertical movement of the plate 58 with respect to the flanges 56. Slots 60, shown in Figs. 2 and 3, extend substantially the full height of plate 58 and contain inserted adjustable screws 61 which are properly threaded into the bottom portion of flanges 56. Positioned between the head of each screw 61 and outer surface of plate 58 is a spring 62 and washer 63 (see Fig. 2) which allow ready adjustment of the vertical position of plate 58. Referring in particular to Fig. 2, the dotted line 64 illustrates a different position in which the plate 58 may be maintained when it is desired to reduce the amount of air induced by the fan 37 through the grid 15. As previously stated, the labels processed by the apparatus of the present invention may vary in thickness and flexibility. An extremely thin label does not require as high a degree of suction as a thicker one to properly maintain it against the grid surface. Therefore the amount of air induced through the grid 15 can be regulated by suitable positioning of the plate 58 without requiring an adjustment of the speed of the fan 37. The higher the position of the plate 58 in relation to the flanges 56, the greater the back-pressure built up within the fan housing 34 resulting in a decreased induction of air through the grid 15.

As stated previously, the grid of the present invention is highly desirable from the standpoint that less material is required to supply a suitable heating surface when such a surface is slotted. It is also desirable from the standpoint that it can be made as a single unit or in the form of individual grid members. Due to this, such a grid is readily replaceable. By utilizing a slotted grid, it is possible to obtain a greater air current passing therethrough, thereby providing a greater cooling effect on that portion which is not in contact with the label. Also, a slotted grid allows air to be drawn therethrough in straight lines thereby acting on the label to flatten it against the grid surface. Apertured heating surfaces exert suction in isolated spots which has a tendency of holding the label against the surface in its original condition. For example, if a label is presented to an apertured grid in a bunched condition, the suction through the isolated apertures tends to fix the label to the grid without straightening it out. Suction drawn in straight lines will tend to pull a bunched label to a completely flattened position. Such a grid is lighter in construction and, due to the fact that individual heating elements can be embedded in each grid member, more even heating and better temperature control is obtained.

By utilizing an exhaust-type fan, which is of relatively low cost in manufacture, the device is completely portable and only an electrical outlet is necessary for its operation. There is no need for air exhaust pump fittings or the like when the device is put into operation. The degree of suction obtained is readily regulated with the provision of an adjustable outlet opening. Due to the type of controls provided with the device of the present invention, namely, the thermostats and the adjustable plate 58, the amount of dwell time necessary is more readily determined and permanently fixed. With little effort, the amount of time necessary to completely activate any particular label can be readily determined. This is not only true with respect to the application of labels to packages, but also with respect to the sealing of packages. Various methods of sealing packages can be used in conjunction with the device of the present invention. For example, heat activated labels can be applied to the folded ends of product wrappers thereby sealing the wrapper without requiring further effort. Where heat sealable packaging material is utilized, the device of the present invention can be used as a direct means of heat sealing the wrapper. For example, the slotted grid, as disclosed and described, can be used to receive heat-sensitive material and suitably heat seal such

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material to form a finished package. If desired, a portion of the grid 15 can be made from a continuous surface without the presence of slots and this surface can be used to seal a product wrapped in heat sealable material while the remaining portion of the grid, being slotted, can be used for the application of a label to the package. It should be clear that in using the device of the present invention, a label can be applied to any desired portion of a wrapped product or to the wrapping material alone. As a matter of fact, the label can be activated by the device and removed manually and applied to wrapping material. Normally, in operation the grid 15 is maintained at a temperature somewhere between 200° and 500° F. depending upon the particular type of adhesive coating to be activated. The grid 15 can be made to conform with any desired configuration. As a matter of fact, the grid can be shaped to conform with the shape of a particular product thereby pre-shaping the label during activation to the desired configuration.

Obviously many modifications and variations of the invention as hereinbefore set forth, may be made without departing from the spirit and scope thereof, and therefore only such limitations should be imposed as are indicated in the appended claims.

I claim:

1. A self-contained label activating device, consisting of a portable casing, said casing being provided in one face thereof with a substantially flush plate provided with laterally spaced parallel slots, electrical means for heating the outer surface of the plate to a temperature which will cause a heat sealable coating on the back of a label to be instantly rendered tacky when the front of the label is brought into surface contact with the plate, a housing within the casing behind the plate having an opening in register with the slots in the plate, a suction fan within the housing, a motor beneath the housing within the casing for operating the suction fan, and adjustable valve means within the casing operatively associated with another opening in the housing for regulating the amount of air drawn into the housing through the slots in the plate.

2. A device suitable for use in activating thermo-activated adhesive coating on relatively thin flexible backings, said device including a grid to receive a backing and activate the coating thereon, said grid having a plurality of relatively flat members, said members spaced to allow the passage of air therebetween, heating means associated with each member of said grid, inducing means for inducing the passage of air between the members of said grid, and restraining means intermediate said grid and said inducing means to restrain the movement of the backing between said members, said restraining means including a screen positioned immediately below the members of said grid.

3. A device suitable for use in activating thermo-activated adhesive coatings on relatively thin flexible backings, said device including a grid to receive a backing and activate the coating thereon, said grid having a plurality of relatively flat members, said members spaced to allow the passage of air therebetween, heating means associated with each member of said grid, inducing means for inducing the passage of air between the members of said grid, said inducing means including a fan mounted in a housing, said housing having an air exhaust to one side thereof, closing means associated with said exhaust to control the amount of air induced between the members of said grid, and restraining means intermediate said grid and said inducing means to restrain the movement of the backing between said members.

4. A device suitable for use in activating thermo-activated adhesive coatings on relatively thin flexible backings, said device including a housing, a grid on one side of said housing, said grid having a plurality of relatively flat members, said members spaced to allow the passage of air therebetween, heating means associated with each

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member of said grid to heat said members sufficiently to activate thermo-activated adhesive coatings of backings brought into contact with the outer face of said grid, a screen in said housing below said grid to restrain entry of backings into said housing between the members of said grid, an air chamber having an inlet and outlet in said housing below said screen, the inlet of said chamber below said screen and directed toward said grid, the outlet of said chamber directed to one side of said housing away from said grid, air inducing means in said chamber to draw air through said grid and said inlet of said chamber and exhaust the air through said outlet, driving means in said housing to drive said air inducing means, and adjustable regulating means in said housing and associated with said outlet to control the amount of air drawn through said grid.

5. A device suitable for use in activating thermo-activated adhesive coatings on relatively thin flexible backings, said device including a housing, a grid on one side of said housing, said grid having a plurality of relatively flat members, said members spaced to allow the passage of air therebetween, heating means associated with each member of said grid to heat said members sufficiently to activate thermo-activated adhesive coatings of backings brought into contact with the outer face of said grid, a screen in said housing below said grid to restrain entry of backings into said housing between the members of said grid, an air chamber having an inlet and outlet in said housing below said screen, the inlet of said chamber below said screen and directed toward said grid, baffle means associated with said inlet to alleviate recirculation of the air within said air chamber, the outlet of said chamber directed to one side of said housing away from said grid, air inducing means in said chamber to draw air through said grid and said inlet of said chamber and exhaust the air through said outlet, driving means in said housing to drive said air inducing means, and adjustable regulating means in said housing and associated with said outlet to control the amount of air drawn through said grid.

6. A self-contained label activating device, consisting of a portable casing, said casing being provided in one face thereof with a substantially flush plate provided with laterally spaced parallel slots, electrical means in direct contact with said plate for heating the outer surface thereof to a temperature which will cause a heat sealable coating on the back of a label to be instantly rendered tacky when the front of the label is brought into surface contact with the plate, a housing within the casing behind the plate having an opening in register with the slots in the plate, a suction fan within the housing, and a motor behind the housing within the casing for operating the suction fan.

7. A device suitable for use in activating thermo-activated adhesive coatings on relatively flexible backings, said device including a heat conductive means to receive a backing and activate the coating thereon, heating means associated with said heat conductive means, said heat conductive means having apertures therein to allow the passage of air therethrough, inducing means associated with said heat conductive means for inducing the passage of air through the apertures therein and toward said inducing means, and independent means associated with said apertures intermediate said heat conductive means and said inducing means which restrains the movement of the backing therethrough.

8. A device suitable for use in activating thermo-activated adhesive coatings on relatively thin flexible backings, said device including a heat conductive plate to receive a backing and activate the coating thereon, heating means associated with said heat conductive plate, said heat conductive plate slotted to allow the passage of air therethrough, an induction fan associated with said heat conductive plate for inducing the passage of air through the slots therein and toward said fan, and in-

dependent means associated with said plate intermediate said plate and said fan which restrains the movement of the backing through the slots.

9. A device suitable for use in activating thermo-activated adhesive coatings on relatively thin flexible backings, said device including a grid to receive a backing and activate the coating thereon, said grid including a plurality of relatively flat members, said members spaced to allow the passage of air therebetween, heating means in each of said members and extending longitudinally thereof, inducing means for inducing the passage of air between the members of said grid, and independent restraining means intermediate said grid and said inducing means to restrain the movement of the backing between said members.

10. A label activating device including a casing, said casing being provided in one face thereof with a flat solid one-piece plate of generally rectangular form provided within its margins with a plurality of parallel slots, which slots divide the face of the plate into a plurality of bar-like integrally connected sections, and which slots are but a small fraction of the width of the sections, electrical means in direct contact with said plate for heating the outer surface thereof to a temperature which will cause a heat sealable coating on the back of a label to be instantly rendered tacky when the front of the label is brought into surface contact with the plate, a housing having an opening in register with the slots in the plate, a suction fan within the housing, and a motor associated with said housing for operating the suction fan.

11. A label activating device including a casing, said casing being provided in one face thereof with a flat solid one-piece plate of generally rectangular form provided within its margins with a plurality of parallel slots, which slots divide the face of the plate into a plurality of bar-like integrally connected sections, and which slots are but a small fraction of the width of the sections, electrical means associated with said plate for heating the outer surface of the plate to a temperature which will cause a heat sealable coating on the back of a label to be instantly rendered tacky when the front of the label is brought into surface contact with the plate, a housing having an opening in register with the slots in the plate, a suction fan within the housing, a motor associated with said housing for operating the suction fan, and independent means associated with said slots intermediate the inner face of said plate and the opening of said housing to restrain the movement of a label inwardly through said slots.

12. A label activating device including a casing, said casing being provided in one face thereof with a flat

solid one-piece plate of generally rectangular form provided within its margins with a plurality of parallel slots, which slots divide the face of the plate into a plurality of bar-like integrally connected sections, and which slots are but a small fraction of the width of the sections, electrical heating means imbedded in each of said bar-like sections and extending longitudinally thereof for heating the outer surface of the plate to a temperature which will cause a heat sealable coating on the back of a label to be instantly rendered tacky when the front of the label is brought into surface contact with the plate, a housing having an opening in register with the slots in the plate, a suction fan within the housing, a motor associated with said housing for operating the suction fan, and independent means associated with said slots intermediate the inner face of said plate and the opening of said housing to restrain the movement of a label inwardly through said slots.

13. A label activating device including a casing, said casing being provided in one face thereof with a flat solid one-piece plate of generally rectangular form provided within its margins with a plurality of parallel slots, which slots divide the face of the plate into a plurality of bar-like integrally connected sections, and which slots are but a small fraction of the width of the section, a heat resistant material applied to the outer surface of said plate, said material exhibiting non-tacky properties with respect to a label brought into contact therewith to alleviate adherence between a label and said plate, internal conduits in each of said bar-like sections extending longitudinally thereof and having received therein electrical means for heating the outer surface of the plate to a temperature which will cause a heat sealable coating on the back of a label to be instantly rendered tacky when the front of the label is brought into surface contact with the plate, a housing having an opening in register with the slots in the plate, a suction fan within the housing, and a motor associated with said housing for operating the suction fan to induce air inwardly through said slots.

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