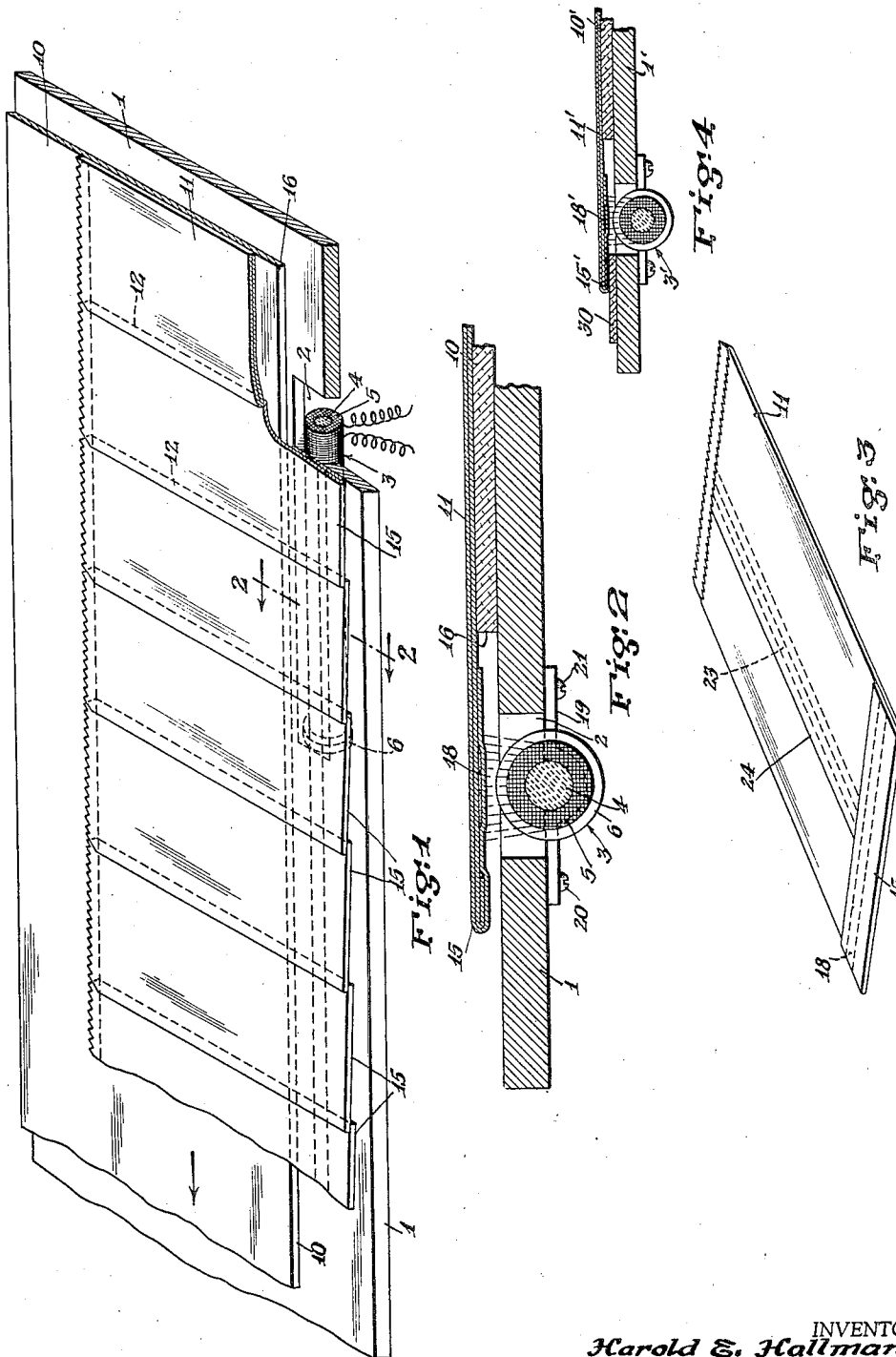


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HEAT SEALING DEVICE

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HEAT SEALING DEVICE

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6 Claims. (Cl. 93—8)

My invention relates to an apparatus and a method for obtaining a more perfect bond in the formation of the bottoms of bags from wax coated paper when a heated adhesive is employed. More specifically my invention relates to an apparatus and a method for applying heat directly to bag bottoms after they have been pasted with an adhesive so that the heat strikes the adhesive area causing the wax to melt, thus permitting the adhesive to strike through to the fibres of the paper.

By means of my invention I can accomplish a superior bond in bag bottoms without the necessity for added steps. I accomplish my results by applying heat in the manner to be specified as the bags travel over a delivery belt.

Difficulty has been experienced hitherto in obtaining a good bottom seal in the manufacture of bags from wax coated paper. This is because the wax in itself affords an insufficient bond for many purposes, and because when an added adhesive is employed in the securing of the bag bottoms, the adhesive obtains an insufficient bond upon the wax and hence fails to properly secure the bag bottom.

It has been suggested that the heat be applied to the glue together with pressure, but this method is imperfect in that the pressure tends to squeeze out the glue from the desired locale. It has further been suggested that heat be applied without pressure, but the devices for accomplishing this result hitherto have been unsatisfactory. This is particularly because when no pressure is employed, the bag bottom may tend to separate under the application of heat, and although the adhesive strikes through to the paper, there is a physical separation which makes for defective bottoms.

The apparatus of my invention comprises a bed plate over which travels a delivery belt. Bags are delivered to the delivery belt, after they have been pasted and folded to form the finished bag, in such a manner that each bag overlaps the others at the edge for a distance of on the order of one-quarter of an inch.

It is the object of my invention to so heat the bottom of the bag so that the glue which lies between the bottom folds is enabled to strike through the wax coatings and bond the paper, thus securing a further bottom for the bag. The action of the glue in the bag bottom before the operation of my invention is insufficient to firmly bond the bottom since the glue lies on the wax and not on the paper. The overlap of the adjacent bags on the belt referred to above presses the bags together so that the subsequent heating action to

which the bag bottoms are subjected makes possible simultaneously a slight pressure on the bag bottom and a holding pressure on the bag bottom so that a better bond is secured.

The heating is effected by locating a long heating element in a cut away portion of the bed plate over which the delivery belt passes. The heater is located along one side of the delivery belt and the bags are positioned upon the delivery belt so that they extend beyond the edge of the delivery belt and pass over the longitudinally extending heater. It is not ordinarily necessary to support the extreme end of the bag, but if the particular bag construction requires such end support, then it is possible to employ two belts, one belt carrying the body of the bag and one belt carrying the extreme end of the bottom of the bag. The bottom of the bag travels over the longitudinally extending heater. The heater is an exposed radiant heater and may comprise a tube with electric coils wrapped around it, the heat being radiated directly on to the bag bottom and hence to the wax which surrounds the adhesive. The heat applied and the length of time during which it is applied is sufficient to melt the wax coating so that the glue can strike through and secure the fibres of the paper.

Accordingly, it is an object of my invention to provide a novel means for causing the glue on the wax coated paper of the bottom of the bag to strike through the wax and secure itself to the paper.

It is another object of my invention to apply heat to the bottom of the bag to cause the glue to strike through the wax while at the same time exerting a slight pressure on the bottom of the bag.

It is still another object of my invention to apply heat to strike through the wax coated paper on the bottom of a bag while maintaining the bottom of the bag in such a position that a more perfect engagement will be effected.

It is a further object of my invention to provide a method for obtaining a more perfect bottom seal by passing bags in which the bottoms thereof have had glue applied but not absorbed on to a delivery belt so that such bags overlap each other and so that the bag bottoms extend over the edge of the delivery belt, and applying radiant heat to the bag bottom with particular reference to the glue area thereof, so that the wax coating will melt and the glue will strike through to secure the paper.

These and other objects of my invention will

become apparent from the description which follows.

In the drawing,

Figure 1 is a perspective partially cut away showing the bags on the delivery belt in accordance with my invention.

Figure 2 is a cross-section taken through the line 2-2 of Figure 1.

Figure 3 is a perspective of the bag of my invention.

Figure 4 is a cross-sectional view showing the modified form of my invention.

Referring now more specifically to the drawing, in Figure 1 is shown a bed plate 1 with the cut-away section 2 in which lies the heater 3 which is made up of the porcelain tube 4 and the wires 5 wrapped therearound. The heater is maintained in position by the ring 6. Over the bed plate 1 rides the delivery belt 10 moving in the direction indicated by the arrow. Resting on the delivery belt and carried thereby are the bags 11 which overlap as shown by the solid end of the upper bag and the dotted end of the lower bag at 12. The bottoms of the bags 15 extend over the edge 16 of the delivery belt 10.

In Figure 2 is shown the bed plate 1 and the porcelain tube 4 with the heating element therearound. Of particular importance is the relative position of the bottom of the bag 15 which, as can be seen, overhangs the end of the delivery belt 10. The radiant heat from the heating element is directed upon the glue line 18 to cause the glue to strike through the wax coating melted by the heat. The bracket 19 secures the heating element to the bed plate 1 by suitable fastening means 20 and 21.

Referring now to Figure 3 there is shown therein the bag 11 with the bottom 15 and the glue line 18 which is initially positioned on the wax coating and extends across the bottom of the bag. The glue line 22 secures the longitudinal seam 24 of the bag.

In the modified form of my invention shown in Figure 4 there is shown, using like numbers as used hereinbefore, a bed plate 1', delivery belt 10', bag 11', and heating element 3'; the bag 11' travels on the delivery belt 10' and is supported at the extreme end of its bottom by the delivery belt 30. Glue line 18' is again exposed to the direct radiant heat of the heating element 3'.

For the introduction to the apparatus of the present invention, bags are formed by suitably securing the longitudinal seam to form a tube of wax coated paper. The tube is severed into sections of predetermined length to provide bag sections and at one end of the bag section a line of glue is placed on the wax coated paper and the end section is folded over on the glue line with or without heat and/or pressure. The bottom is now secured by the adhesion of the wax coatings of the paper but it is necessary for a more secure bond that the glue be so treated as to strike through the wax coating and secure itself to the paper. Accordingly the bags are passed on to a delivery belt and, as shown in Figure 1, the bags are positioned to overlap each other at the ends so that there is a constant engagement of each bag upon the adjacent bags so that there is a holding of the bag bottom and a slight pressure exerted on to the bag bottom. While in this position the bags are passing over a longitudinally extending exposed radiant heating element which throws a rather intense heat on to the wax coated paper at the glue line.

The heat causes the wax to melt and the glue to strike through the melted wax to secure itself to the paper whereupon a permanent and secure bond is obtained for the bottom of the bag.

By means of this securely welded glue bond and the adjacent heat seal of the wax a firm and, at the same time, moisture proof and sift proof bag bottom is obtained. When the bag bottom is of such length and weight that a support is needed at the end of the bag, then an auxiliary belt may be employed which travels in timed relation with the main belt and supports the end of the bag. In all cases, however, the bag bottom with the area of the glue line is subjected to the heat as it moves slowly along on the delivery belt.

The relatively simple method of my invention may be employed in conjunction with any transfer of the bags and thus entails no additional machine space. The elements of my machine are simple but the heat treatment outlined above effects surprising new and unexpected results in that the bag bottoms made according to this invention are surprisingly strong in contrast to those hitherto made without the use of this method.

In the specification and claims the terms glue and adhesive are used interchangeably and are meant to indicate any suitable adhesive mix. Preferably, the adhesive mix may comprise a paste or glue in combination with a solvent. The solvent is customarily a volatile solvent such as alcohol, acetone or the like. The solvent, when heated facilitates the penetration of the glue through the wax coating to the paper.

In this connection it is to be noted that the exposed radiant type heater which has been described has particular advantages in contrast to a contact type heater, in view of the fact that it is primarily desired to heat the wax coating and the adhesive mix which lie between the paper folds. Thus, whereas a contact heater would apply by far the greatest amount of heat to the outside wax coating, the radiating heat of the exposed radiant type heater applies heat more equally so that the inner wax coating and heat responsive solvent-adhesive mix are affected.

The slight lateral pressing action of the overlapping adjacent bags on each individual bag bottom fold provides an ideal type of pressure for the problem involved. When the wax under the glue is being melted to induce penetration of the glue into the fibres of the paper and when the adjacent wax is being melted to provide a heat seal, it is preeminently desirable that a slight pressure be exerted on the bottom fold so that the bottom of the bag becomes securely bound. Too great a pressure or a heavy pressure of any nature would tend to squeeze out the adhesive and thus make for an insecure joint. However, the hold and pressure effect obtained by the overlapping formation is just that required to maintain the bag bottoms during the melting of the wax and the penetration of the adhesive and this same slight pressure also tends to force the adhesive into contact with the fibres of the paper in a very desirable manner.

Although I have particularly referred throughout to bag bottom formation, it is obvious that this invention is applicable wherever the present problem is involved in the manufacturing of articles from coated paper or the like. That is, when joints of the nature indicated herein are

desired, method and apparatus set forth may be employed with obvious modifications.

Although I have described wax coated paper, it is to be understood that this invention includes within its scope paper coated with any similar material through which it is desired to effect the penetration of an added adhesive. Further within the scope of paper I include equivalent materials. From the teachings set forth herein there are certain apparent modifications within the scope of my invention. I intend, therefore, not to be bound by the particular description set forth but only by the appended claims.

I claim:

1. An apparatus for inducing adhesive penetration in bag bottoms formed from wax coated paper comprising a bed plate, a cutaway portion in said bed plate, a heater positioned in said cutaway portion, and a delivery belt travelling over said bed plate.

2. An apparatus of the character described comprising a bed plate, a cutaway portion in said bed plate, an exposed radiant type heater positioned in said cutaway portion, a delivery belt travelling over said bed plate, said heater being positioned along said delivery belt.

3. An apparatus of the character described comprising a bed plate, a cutaway portion in said bed plate, an exposed radiant type heater positioned in said cutaway portion, a delivery belt travelling over said bed plate, said delivery belt being adapted to carry, the bags being positioned on the delivery belt so that they overlap one another laterally and so that the bag bottoms extend over the side of the delivery belt, said heater being positioned along the side of said

delivery belt to heat the extending bag bottoms.

4. An apparatus for inducing adhesive penetration in bag bottoms formed from wax coated paper comprising a conveyor belt adapted to carry bags arranged transversely thereon, an auxiliary belt travelling at substantially the same speed as said conveyor belt and adapted to support the bottoms of the bags carried by said conveyor belt and an exposed radiant type heater positioned between said conveyor belt and said auxiliary belt.

5. An apparatus for inducing adhesive penetration in bag bottoms formed from wax coated paper comprising a delivery belt adapted to carry bags and an exposed radiant heater extending along the side of the delivery belt, said exposed radiant heater being substantially parallel with said delivery belt and lying immediately adjacent thereto but below the plane of said delivery belt, said exposed radiant heater extending only along a portion of the length of said delivery belt.

6. In the manufacture of bags from coated paper the steps of depositing an adhesive on the coated paper, folding over the coated paper to form a bag so that the adhesive lies between two layers of coated paper, depositing bags so formed onto a travelling belt so that each bag overlaps an adjacent bag and maintains a slight pressure on the folded bottom part of the bag, and applying a radiant heat to said folded over bottom part and the adhesive which lies between the coatings on the paper to cause the coatings to melt and the heated adhesive to penetrate through the melted coating to the paper.

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