METHOD FOR SHRINK WRAPPING SHOES IN PROCESS

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ABSTRACT OF THE DISCLOSURE

A method for protecting partially completed shoes during shoemaking process by sealing the shoes in a heat shrinkable wrapping material which is then shrunk tightly around the shoes by the application of heat. After subsequent shoemaking operations, the heat shrink wrapping material is removed before the shoes are completely finished and packaged for distribution in the stream of commerce.

Brief summary of the invention

In the shoemaking industry, considerable time and money are expended to rectify, if possible, the damage which occurs to the shoes during the shoemaking process. The partially completed shoe is subjected to a variety of handling operations during the shoemaking process which expose the shoe to the risk of nicks, cuts, abrasions, staining, dirt and other deleterious substances. In the case of high quality shoes and light colored shoes the problem of production line damage is especially severe. In many instances, such damage cannot be corrected at the cleaning station and the finished shoe must be rejected with a concomitant increase in the ultimate cost of goods sold. Various attempts have been made in the shoe industry to reduce the portion of the reject rate that is attributable to production line damage. One method employed a bag or cover that was open at the top and bottom and worked at both ends. The open bag was stapled to the in-seam rib with the open cover on top of the shoe. Although the bagging method provided sufficient protection for the partially completed shoes, it never gained wide acceptance in the shoe industry because of cost considerations involving not only the price of the bagging material itself, but also the cost of labor for performing the time consuming bagging operation.

It is accordingly a general object of the present invention to provide a process for protecting partially completed shoes during the shoemaking process which eliminates the disadvantages of the prior art methods.

It is a specific object of the present invention to utilize a heat shrinkable wrapping material which can be shrunk tightly around the partially completed shoe at a predetermined point in the shoemaking process and, thereafter, can be easily removed before the shoes are finished and enter the stream of commerce.

It is a feature of the present invention that the process for protecting partially finished shoes utilizes readily available equipment and relatively inexpensive materials.

It is another feature of the invention that the process is relatively inexpensive from the standpoint of labor costs because of the extreme rapidity with which the shoes can be protectively sealed in the heat shrinkable wrapping material.

These and other objects and features of the invention will best be understood from a more detailed description of a preferred embodiment of the invention, selected for purposes of illustration, and shown in the accompanying drawings in which:

FIGURE 1 is a plan view of a sealing and shrinking station illustrating the flow path of the partially finished shoe through the sealing, shrinking and collecting operations;

FIGURE 2 is a side elevation of the sealing and shrinking station illustrated in FIGURE 1;

FIGURE 3 is a side elevation of a partially finished shoe showing the heat shrink material covering the outer surfaces thereof;

FIGURE 4 is a view illustrating the bottom of the shoe depicted in FIGURE 3 and the operation of slitting the heat shrink wrapping material along the longitudinal axis of the shoe;

FIGURE 5 is another view of the bottom of the shoe depicted in FIGURE 3 showing an alternative embodiment wherein the heat shrink material does not seal the entire bottom of the shoe;

FIGURE 6 is another view of the bottom of the shoe illustrating the application of a Welt to an up-standing in-seam rib; and

FIGURE 7 is a view in cross-section of a portion of the wrapped shoe showing the physical relationship of the heat shrink wrapping material to the various structural components of the shoe.

Turning now to the drawings, there is shown in simplified form the process of the present invention for protecting partially completed shoes during the shoemaking operation. Briefly, the method of the present invention comprises the steps of sealing a partially finished shoe in a heat shrinkable wrapping material and then subjecting the sealed shoe to sufficient heat to shrink the wrapping material tightly around the partially finished shoe. Thereafter, the normal shoemaking operations can be performed on the wrapped shoe. Once the shoe is substantially completed, the heat shrink wrapping material is removed from the shoe, generally at the time the last is pulled. Subsequent finishing operations, lacing and packaging, are performed in the normal manner before the shoe is ready for distribution in the stream of commerce. It will be appreciated that the equipment and materials for performing the process of the present invention will be readily available to those in the shoemaking industry because such equipment and materials are widely used at the present time to wrap finished products before they enter the stream of commerce. The present invention, in contrast to the current usage of heat shrinkable materials, provides for the use of heat shrinking wrapping materials on partially finished goods only while such goods are being processed and, unlike current practice, the heat shrink wrapping material is removed before the goods are completely finished and enter the stream of commerce.

Looking now at FIGURES 1 and 2, there is shown in plan view and side elevation respectively, a sealing unit and a shrinking unit indicated generally by the reference numerals 10 and 12, respectively. Commercial units for performing the sealing and heating operations are readily available and well known to those in the packaging art. For example, the process of the present invention has been successfully practiced on a sealing machine manufactured by the Weldotron Corporation of Newark, N.J., under the nomenclature "Console-Type Semi-Automatic Pouch Forming Machine, Series 5200." Other sealing units can, of course, be used to practice the process of the present invention.

Briefly, the sealing unit 10 comprises a supply roll 14, a work surface 16, a selectively operable conveyor 18 and a pivotally mounted sealing head 20 containing one or more selectively energizable sources of radiant energy (not shown). The internal components of the sealing
machine 10 such as the pneumatic or hydraulic systems, electrical drive or motors and so forth have not been shown in the drawings for purposes of clarity.

The supply roll 14 has a heat shrinkable film 22 wound thereon in sleeve form with a fold line 220 facing away from the operator as viewed in FIGURE 1. A number of readily available heat shrinkable materials can be used to practice the present invention. For example, we have successfully used heat shrinkable films sold by the E. I. du Pont Company under the trademark "Clyser" and PVC Shrink Films sold by the Reynolds Metals Company under the trademark "Reynolon." Film thicknesses may range from .25 to 2.00 mils, but we prefer a film thickness of between .75 and 2.00 mils for maximum strength.

Referring to the plan view shown in FIGURE 1, it can be seen that the normal operator position is located directly in front of the sealing head 20. When wrapping a partially completed shoe 24, the operator places they shoe 24, the center folded heat shrinkable film 22 and then moves both the shoe and film together to a position directly beneath the pivotally mounted sealing head 20, as shown in FIGURE 1. The shoe 24 should be positioned with the heel portion of the shoe reasonably close to the groove produced by 20. It is desirable to keep the bag size as small as possible in order to insure a good, tight shrink of the heat shrinkable film 22. Preferably, the toe of the shoe should be pointed up in the front corner of the bag with the shoe立项 on its side with the sole facing the operator. The shoe is thus lying along a diagonal of the bag as illustrated in FIGURE 1. This position will insure a good, clear wrap with no seams or irregularities that would interfere with the subsequent shoe-making operations.

After positioning the shoe within the center folded film and locating both the film and shoe beneath the pivotally mounted sealing head 20, the operator initiates the sealing cycle by actuating the appropriate machine control (not shown). The sealing head 20 is automatically lowered to the horizontal or sealing position by pneumatic or hydraulic means. When the sealing head 20 is in the sealing position, the sources of radiant energy are energized to seal the upstream edge and facing side of the center folded heat shrinkable film. The sealing operations sever the upstream edge of the formed bag from the leading edge of the next "bag." Thus, after the first sealing cycle without a shoe, the leading edge of each bag is sealed by the preceding sealing operation. In other words, each actuation of the sealing head 20 seals the upstream side of bag 26 and the side facing the operator as shown in FIGURE 1.

After sealing, the bagged shoe 24 is moved by conveyor 18 onto a conveyor 28 which carries the bagged shoe through a heat tunnel 30. Any commercially available heating unit can be employed at this stage. We have found that a shrink tunnel sold by the Weldotron Corporation of New Jersy, under the designation "Model 7121," suffices.

The heat tunnel 30 generates sufficient heat to cause the heat shrinkable film 22 to shrink tightly around the partially finished shoe, as shown in FIGURES 3 and 4. Looking for a moment at these figures, it can be seen that the heat shrink film 22, shown in cross-section in FIGURE 3 for purposes of clarity, completely covers the center folded shoe with a tight, protective film.

It will be appreciated that since the heat shrink film conforms to the compound curvatures of the partially finished shoe, the wrapped shoe can be easily handled during subsequent shoe-making operations. In contrast to the bulky prior art stapled bags, the shrink wrapped shoe of the present invention can be easily pulled from the racks and replaced thereon after each shoe-making operation.

After emerging from the heat tunnel 30 on conveyor 28, the wrapped shoe 24 is diverted horizontally by a deflector 32 onto a return conveyor 34. Conveyor 34 returns the wrapped shoe to the operator position where the operator can remove the shoe for racking. A collecting tub 36 is provided at the end of the return conveyor 34 to collect the wrapped shoes in the event that the operator is not free to remove the shoes for the conveyor 34 as they pass the operator station.

After removing the wrapped shoe 24 from the return conveyor 34, the operator then slits the heat shrink plastic film 22 substantially along the longitudinal axis of the shoe, as illustrated in FIGURE 4. The bottom of the heat shrink wrapping material 22 is slit to allow insertion of a channel guide 38 for in-seam stitching a welt 40 to the upstanding Goodyear rib 42 as illustrated in FIGURE 6. Although the slitting of the heat shrinkable material 22 has been depicted in FIGURE 4 as occurring after the material has been shrunk in heat tunnel 20, it is possible, as an alternative mode of operation, to slit or cut the heat shrinkable material after the sealing operation, but prior to shrinking the film in the heat tunnel. If the heat shrinkable material is cut along the bottom of the shoe prior to heat shrinking, the heat shrinkable material will open up under tension as the film shrinks. FIGURE 5 illustrates the opening of the heat shrinkable material separate along the longitudinal axis of the shoe during the heat shrinking operation.

The structural relationship of the heat shrink wrapping material and the various components of the partially finished shoe are illustrated in FIGURE 7. Looking at that figure, it can be seen that the heat shrink wrapping material 22 completely covers the shoe upper 44 and is positioned between the welt 40 and the upper 44. The heat shrink film 22 is removed from the shoe after the shoe is completely finished and packaged for distribution in the stream of commerce. The particular point at which the heat shrink protective film is removed can be selected by the manufacturer. However, we have found that removal at the time the last is pulled is a convenient point in the shoe-making process.

While the preceding description of the process of our invention has been related to the making of Goodyear welt shoes, it should be understood that the process of protecting partially finished shoes by the use of a heat shrinkable material is not limited specifically to Good year welt type shoes. For shoes where the attachment of a sole is made through the sole, the sealing operation must be exercised by the operator that the heat shrinkable wrapping material is removed from the cementing area. With this caveat, it will be understood by those skilled in the art that the process is feasible for cemented shoes.

Having described in detail our method for protecting partially completed shoes in process by the use of a heat shrinkable wrapping material, it will now be obvious that numerous variations can be made by those skilled in the art without departing from the scope of the following claims.

What we claim is:

1. A method for protecting a partially completed shoe during the shoe-making process comprising the steps of:
   sealing said partially finished shoe in a heat shrinkable wrapping material; heat shrinking said wrapping material around said shoe; slitting the heat shrink wrapping material that covers the bottom of said shoe substantially along the longitudinal axis thereof; and, thereafter removing the heat shrink wrapping material before said shoe is completely finished.

2. A method for protecting a partially completed shoe during the shoe-making process comprising the steps of:
   sealing said partially finished shoe in a heat shrinkable wrapping material; heat shrinking said wrapping material that covers the bottom of said shoe substantially along the longitudinal axis thereof; heat shrinking said wrapping material around said shoe; and, thereafter removing the heat shrink wrapping material before said shoe is completely finished.
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3. A method for protecting a partially completed shoe during the shoemaking process comprising the steps of: sealing said partially finished shoe in a heat shrinkable wrapping material and heat shrinking said wrapping material around said shoe so that said heat shrunk wrapping material defines an opening on the bottom of said shoe substantially along the longitudinal axis thereof; and, thereafter removing the heat shrunk wrapping material before said shoe is completely finished.

4. The method of claim 3 wherein said opening extends from heel to toe substantially along the longitudinal axis of said shoe.

5. A method for protecting a partially completed shoe during the shoemaking process comprising the steps of: placing said partially finished shoe in a center folded, partially open, seamed bag of heat shrinkable material with the instep portion of said shoe facing said center fold; sealing said bag; heat shrinking said wrapping material around said shoe so that the heat shrunk material covering the instep portion of said shoe is seamless; and, thereafter removing the heat shrunk wrapping material before said shoe is completely finished.

6. The method of claim 5 further characterized by said bag having a generally rectangular shape with the center fold on one side and one edge sealed, said shoe being placed along a diagonal of said bag with the instep portion of said shoe facing the center fold; and, thereafter sealing the other side and edge of said bag.

7. The method of claim 6 further characterized by placing the shoe along a diagonal of the bag with the toe of said shoe being positioned in the corner defined by said center fold and said sealed edge.

References Cited

UNITED STATES PATENTS

2,410,878 11/1946 Harrington.
2,651,857 9/1953 Griswold et al.
3,283,422 11/1966 Nygard 36—1

PATRICK D. LAWSON, Primary Examiner.

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