Fig. 1

Fig. 2

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A method and apparatus for gluing flat-shaped textile fabrics together which comprises a means for automatically conveying the fabric pieces to a first heating and pressing station, where a heated press is used to melt the glue which has been previously applied to one of the fabric layers and simultaneously convert any moisture contained in the fabric layers to steam, which then escapes from the fabric layers. A second heating and pressing operation is performed on the fabric layers, after which the textile fabrics pass through a station where any steam remaining in the fabric layers is allowed to escape.

BACKGROUND OF THE INVENTION

Field of the invention

This invention relates to a method for gluing flat-shaped textile articles by means of heat and pressure whereby the flat-shaped textile articles to be glued together, a portion of which is coated on one side with glue, are placed upon the pressing plates of a gluing press which can be moved toward each other individually or together.

At least one of said plates is heated, especially a plate of a gluing press incorporating a transport device for the flat-shaped textile articles.

The present invention additionally concerns a gluing press for carrying out this method of gluing.

Prior art

It has been found in practice that the gluing process is unfavorably influenced by the vapors which develop during the process.

SUMMARY OF THE INVENTION

The purpose of this invention is to present a method for gluing flat-shaped textile articles in which the gluing process will not be impaired by vapors that are trapped between the pressing plates, respectively, inside the flat-shaped textile articles.

Furthermore, the efficiency of the gluing presses will be increased considerably.

The present invention resides in the fact that the gluing process is subdivided into the following three phases which should preferably come immediately after each other:

A first phase, for heating the flat-shaped textile articles to be glued together in such a manner that at least the inherent moisture of the flat-shaped textile articles or fabrics will be converted into vapor;

A second phase, for evacuating the vapor formed during the first phase and trapped between the pressing surfaces of the pressing plates;

A third phase, for gluing the flat-shaped textile articles by heating them further, in combination with a plastification of the glue coating of the coated textile pieces or filler and the penetration of the glue into the noncoated textile piece of upper or outer material, a penetration which is supported by the application of pressure.

It is preferred to apply the method of this invention in combination with a certain manner of positioning the textile fabrics to be glued together relative to each other in such a manner that two sets of textile fabrics which, in each case, consist of uppers and fillers and which have the same dimensions will be glued together while superposed upon each other in "sandwich" style. This "sandwich" placement method is well-known in itself. Application on a larger scale, however, has so far been impossible because only unsatisfactory results have been achieved with the known gluing methods and gluing presses. The cause for this has been found particularly to be in the trapping of the vapor.

It is particularly advantageous to employ the method according to the present invention in combination with a distribution of the gluing process respectively, the three phases, over two successively arranged pressing stations to which the textile fabrics to be glued together can be supplied by means of a conveyor device, in such a manner that the textile fabrics are heated in the first pressing station in the first phase, they are evacuated during transportation to the second pressing station in the second phase, and are glued together in the second pressing station during the third phase. If the method is applied in this manner, not only the problem of evacuating the vapor will be solved, but at the same time the efficiency of a gluing press will be increased by about one-half if the normal placement pattern is used, because the station time of the gluing press can be roughly cut in half. The output is quadrupled when the "sandwiching" method is used.

As part of the present invention, and especially with a view to the "sandwiching" pattern, it is further contemplated to hold the textile fabrics which are to be glued together during the three phases of the gluing process, between glue-repellent, preferably perforated foils, in such a manner that a change in their relative position can be avoided. If a so-called cooling station is inserted after the heated pressing station—which also is called a hot-pressing station—then it is recommended that the textile fabrics which are to be glued together be held between the glue-repellent foils and rested against the latter during the transfer from the hot-pressing station to the cooling station and during the cooling process.

Additional features of the method according to the present invention and the gluing press for the implementation of the method will be explained below with the help of the examples shown in the drawings, as well as in the claims.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 shows a top view of two sets of textile fabrics to be glued together, placed one on top of the other in "sandwich" style;

FIG. 2 shows a cross section along line A—A, according to FIG. 1;
FIG. 3 shows a longitudinal cross section of a gluing press for carrying out the method according to the invention.

DESCRIPTION OF THE PREFERRED EMBODIMENT

In the "sandwiching" pattern, illustrated in FIGS. 1 and 2, which is particularly advantageously usable within the framework of the method according to the present invention, two sets of textile fabrics which are to be glued together and which consist of an uncoated textile fabric and a textile fabric coated with a glue or, upper and fillers in each case, are so placed upon each other that the uncoated textiles 10 and 11 will lie on the outside and the coated ones 12 and 13 will be on the inside. In this way two sets of the textile fabrics to be glued together can be glued in one gluing, or working operation, thereby doubling the output of a gluing press. This, of course, is assuming that the station time does not have to be extended due to poor heat transfer caused by vapor being trapped.

The gluing press 14, shown in FIG. 3, used for carrying out the method according to the present invention, essentially consists of a spreading or deposit station 15, two heated pressing stations 16 and 17 which are preferably arranged at an interval behind each other to enable the vapor to escape properly, a cooling station 18 and a pickup station 19 as well as a conveyor device 20 for transporting the flat-shaped textile articles 10, 11, 12, 13 from one work station to the other. The heated pressing stations 16, 17 in each case consist of a lower and an upper pressing plate 26, 27, 28, 29. The upper press plate 27, 29 can be liffed off by known means, for example, hydraulic cylinders 30, from the lower press plates 26, 28 and can also be lowered upon these press plates again. Conveyor device 20 can take the form of a conveyor belt 21. Conveyor belt 21 is made of glue-repellent foils and is preferably perforated. It is driven and guided by drive and guide rollers 23. In the area of the heated pressing stations 16 and 17 and cooling station 18, the textile fabrics 10, 11, 12, 13, which are placed on the conveyor belt 21 by the operating personnel at deposit station 15, are guided additionally by another conveyor belt 24, also referred to as a covering or masking belt. This offers the advantage that the textile fabrics 10, 11, 12, 13 during the three phases of the method according to this invention and during subsequent transportation to the cooling station 18 and during the cooling process will be maintained upon conveyor belt 21 without any change in their relative position.

The conveyor belt or covering belt 24 is driven and guided by drive and guide roller 25. It runs at the same rate of speed as conveyor belt 21.

The method according to this invention can be implemented with the previously described gluing press 14 as follows:

The operating personnel places the textile fabric 10, 11, 12, 13, which are to be glued together, on conveyor belt 21 which at that moment stands still in deposit station 15. After this operation has been completed, conveyor belt 21 begins moving in the direction of arrow 22 and thus transports the flat-shaped textile articles to pressing station 16. In pressing station 16, the textile fabrics 10, 11, 12, 13 are further heated, by pressing the heated pressing plates 26 and 27 together; in such a manner that the moisture inherent in them evaporates (first phase). Then the pressing plates 26 and 27 are moved apart again and conveyor belt 21 moves the textile fabrics into the pressing station 17 whose pressing plates 28 and 29 are likewise heated. During the transporting of the textile fabrics 10, 11, 12, 13 from the pressing station 16 to pressing station 17, the inherent moisture in the fabrics, which has been converted into steam, as well as the steam which has been formed during the heating of the glue, can escape. This process is also called evacuation (second phase). Evacuation of vapor also occurs when the textile fabrics 10, 11, 12, 13 rest not only on conveyor belt 21 but are also guided from above by another conveyor belt, the covering belt 24. In this case, however, it is advantageous to perforate both conveyor belts. In pressing station 17, the previously heated textile fabrics and the glue are further heated when the heated pressing plates 28 and 29 are pressed together. If the glue-melting temperature has been reached, so that the glue has become plastified, the glue will then penetrate into the uncoated textile fabrics 10 and 11 (uppers) and thus combine these fabrics with the coated ones 12 and 13 (fillers). After completion of this process (third phase), press plates 28 and 29 are moved apart again and the fabrics 10, 12, respectively, and 11, 13, which have been glued together are moved to a cooling station 18 and then to a pickup station 19 by conveyor belts 21 and 24.

The method according to this invention of course can be carried out not only with a gluing press of the design described before but can be carried out with presses of all other known designs. However, in gluing presses with only one hot-pressing station, it is generally advisable to move the glue-plasticized textile materials from the pressing plates away from each other during the second phase. A renewed pressing operation then takes place for the third phase to be performed in the same heated pressing station.

When the “sandwiching” pattern is used, it is furthermore necessary to make sure that all pressing plates are heated and that their pressing surfaces, if not unpadded, are provided with only a comparatively thin padding, in order to achieve rapid and uniform heat transfer from the press surfaces to the textile fabrics.

What is claimed is:

1. A method for gluing flat-shaped textile fabrics together by means of heat and pressure, wherein a portion of one of the textile fabrics to be glued together is coated with glue on one side, comprising the steps of:
   placing the layers of textile fabrics between the plates of a gluing press which can be moved individually or jointly toward each other;
   heating at least one of the plates of the gluing press;
   moving the plates of the gluing press toward each other to apply heat and pressure to the textile fabrics, with the heat being applied acting to convert the inherent moisture of the flat-shaped textile fabrics into steam;
   moving the pressing plates of the gluing press away from each other to remove the application of pressure to the textile fabrics and permit evacuation of the steam trapped between the pressing surfaces; and
   reapplying heat and pressure to the surfaces of the flat-shaped textile fabrics to cause plastification of the glue coating of the coated textile fabrics and allowing penetration of the glue into the textile fabrics to glue the flat-shaped textile fabrics together.

2. A method according to claim 1, wherein the plastification of the glue coating of the textile fabric is initiated during the first heating and pressing step, because of the use of the corresponding heat and time duration of the first heating and pressing step, as well as the pressure applied during this step, in such a manner that steam can escape from the glue coating so that this steam can be evacuated during the second heating and pressing step.

3. A method according to claim 1, wherein, in a gluing process, two sets of textile fabrics which are to be glued together and which in each case consist of uppers and fillers, are glued together in a manner superimposed upon each other in “sandwich” style.

4. A method according to claim 3, wherein the textile fabrics which are to be glued together are held between perforated glue-repellent foils during the steps of the gluing process on conveyor belts in such a manner that a change in their relative positions is prevented.
5. A method according to claim 4, further comprising the steps of providing a gluing press having two successively arranged pressing stations feeding the textile fabrics which are to be glued together to the two successive stations by means of a conveyor device, each of the two pressing stations consisting of two pressing plates which can be moved toward each other in such a manner that the textile fabrics are heated in the first pressing station, evacuated during the transportation by the conveyor device to the second pressing station, and glued together in the second pressing station.

6. A method according to claim 5, wherein the textile pieces which are glued together are cooled immediately after the gluing process in a cooling station positioned after the second pressing station.

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