

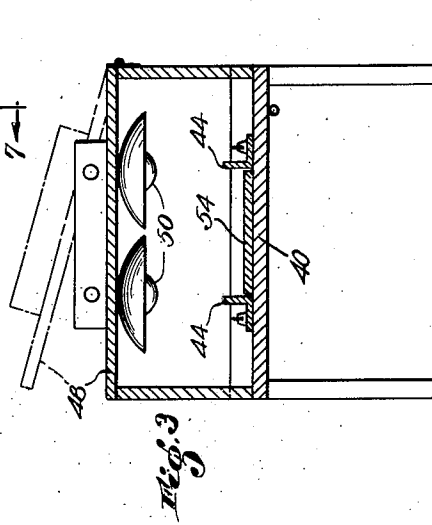
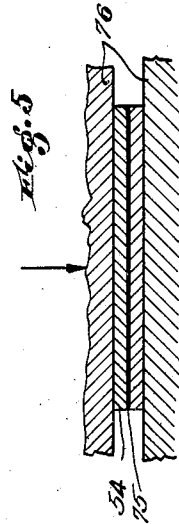
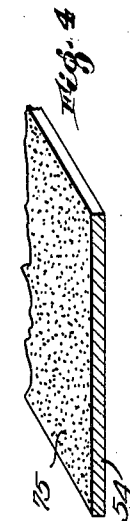
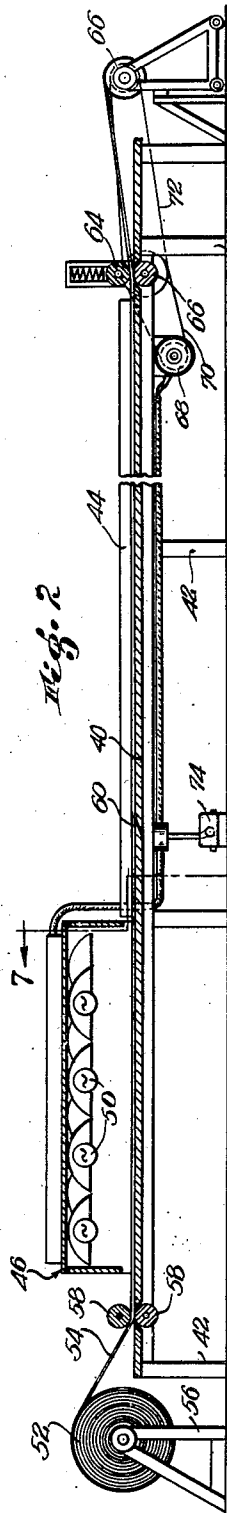
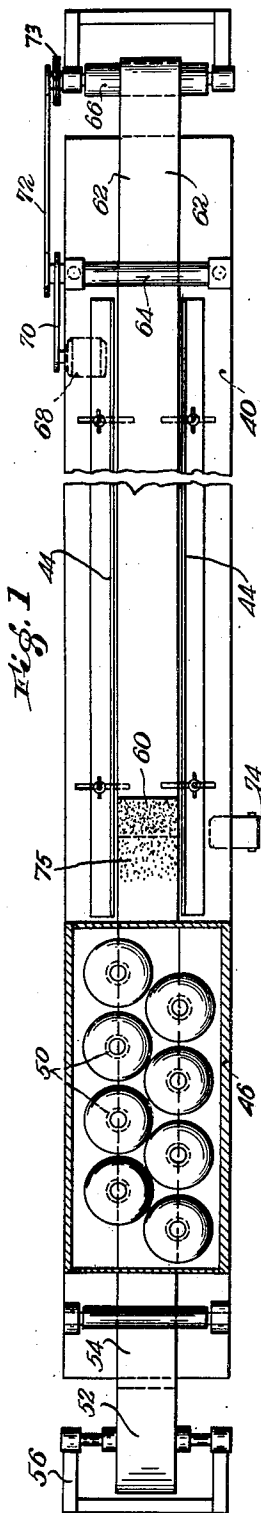
Oct. 18, 1949.

I. DICKINSON

2,484,937

MANUFACTURE OF LEATHER BELTING

Filed Jan. 21, 1947



Inventor:
Ingram Dickinson
by Newmyer & Witter
Attorneys

UNITED STATES PATENT OFFICE

2,484,937

MANUFACTURE OF LEATHER BELTING

Ingram Dickinson, Atlanta, Ga., assignor to
Southern Belting Company, Atlanta, Ga., a cor-
poration of Georgia

Application January 21, 1947, Serial No. 723,279

3 Claims. (Cl. 69—21)

1

This invention comprises an improved method of adhesively bonding together pieces of leather and especially concerns a novel cement impregnating treatment adapted substantially to increase the strength of the resulting bond. Leather belting is formed by adhesively bonding together in end to end relation many short strips of leather skived off at their ends to form overlapping joint shaving beveled surfaces in face to face contact; and multi-ply belts are made by bonding together in face to face contact two or more plies fashioned in the same manner. The primary object of my invention is to provide an improved method of preparing and bonding together such strips and plies to produce belting of substantially increased strength.

In preparing leather for bonding, the faces to be bonded are first roughened and a coating of cement is then applied to these faces. I have discovered that a deeper and more uniform penetration of the cement into the fibres of leather is obtained by heating the leather and evaporating the moisture therefrom before applying the cement, and by preventing condensation of moisture at the coated surfaces during the coating and drying operations. I effect this treatment by subjecting the roughened surfaces, immediately prior to the coating operation, to the action of heating raising the temperature of the leather, above 100° F., sufficiently to expand the air and evaporate moisture from the leather and provide stored heat that will prevent condensation of moisture at said surfaces during the subsequent coating and drying operation, and I have furthermore discovered that a substantially superior product is obtained and my novel method advantageously practiced by employing infra-red heat rays directed onto the surfaces to be coated, all as hereinafter more specifically described.

The method of my invention is applicable to the bonding of strips of leather skived off at their ends and lapped in end to end relation and to the bonding together of two or more plies in face to face contact, and my novel method is applicable in continuous form to the latter. In this application of the invention, the strip of belting to be plied is fed along a predetermined path where it is subjected to the action of heat and treated while hot with a coating of cement. A treatment of this nature, preferably employing infra-red heating units, comprises a further feature of the invention.

These and other features of the invention will be best understood and appreciated from the following description of preferred applications there-

2

of selected for purposes of illustration and shown in the accompanying drawings in which—

Fig. 1 is a plan view, partially broken away, of apparatus that may be employed in practicing my invention.

Fig. 2 is a fragmentary side elevation of the apparatus.

Fig. 3 is a sectional view taken on line 7—7 of Fig. 2,

Fig. 4 is a fragmentary view of a leather strip treated in the apparatus, and

Fig. 5 is a sectional view through two plies of belting held in face to face contact by and between two pressure surfaces.

I have found that a heating of the strips evaporates and so largely removes the moisture from the leather and expands the air therein to such a degree that when cement is applied it penetrates more deeply into the interstices of the fibres. Also the heat retained by the leather prevents lowering of the temperature below the dew point during the coating operation and particularly during the drying operation when the leather is cooled by evaporation of the solvent, thereby preventing the condensation of the moisture on the cement-coated surfaces of the leather.

In Figs. 1-5 is illustrated apparatus for treating continuous plies of leather belting formed by joining the pieces 14 together, which treated plies are to be adhesively united in face to face contact in producing a multi-ply belt. This apparatus comprises a table 40 supported on legs 42 and carrying two adjustable guides 44 for receiving and guiding the work. A housing 46 provided with a pivoted cover 48 carrying two banks of infra-red lamps 50 is disposed above the left hand end of the table. A coil 52 of single ply belting 54 to be treated is shown as supported on a frame 56. The belting is passed from the coil 52 through guide rolls 58 to the table beneath the housing. The belting includes in its length one or more lap joints 60 and passes between pressure rolls 64 to a reel 66 located at the far end of the table. The rolls and reel are operated by an electric motor 68 through belts 70 and 72, a slip clutch 73 being provided in the drive to the reel.

The surface of ply 54 to be coated is previously roughened and is drawn from the coil 52 and along the table by the rolls 64 and reel 66. The lamps 50 and the motor 68 are under the control of a switch 74 located adjacent to the operator's position rearwardly of the housing 46. When the belting ply 54 is drawn from the roll 52 it passes first beneath the lamps 50 and thence along the

table to the reel 66. I have determined that the method is carried out most efficiently when the ply is heated to a temperature of 110° F. and I have found that the locating of the lamps 15 inches above the ply produces such temperature while the ply is passing through the housing at a speed subjecting it to heat rays for a period of one and one-half minutes.

The operator stands just rearwardly of the housing 46 adjacent to the switch 74 and applies a coating 75 of cement to the top surface of the ply as it emerges from the housing and is heated to the desired temperature. The coated ply thereafter continues along the table for a period sufficient to dry the coating by the time it reaches the rolls 64. After passing these rolls the coated ply is wound onto the reel 66. The switch 74 controls both the lamps 50 and the motor 68 so that the lamps are automatically turned off when the motor is stopped, it being understood that the operation is ordinarily performed with the ply in continuous feeding motion along the table. The adjustment of the lamps and feeding speed is such that there is no danger of scorching the leather while it is in motion, and the possibility of allowing the leather to come to rest beneath the lamps is obviated by placing both the motor and the lamps under the conjoint control of the switch 74.

When two coated plies 54 are to be adhesively joined together an additional coating of cement is applied to the surfaces 75 coated on the table 40 and these two faces are then brought into contact and held under pressure between pressure surfaces 76, as illustrated in Fig. 9, until the cement begins to set. The belting is then removed from the press and allowed to dry for a period of six to twenty-four hours.

I have found that bonds made in accordance with my process are 50% to 200% stronger than bonds otherwise made in accordance with standard known practice, the increase in added strength varying with the grade and tannage of leather used. The heat, especially when applied by infra-red heat rays to the face to be coated, expands the air and evaporates the moisture from the leather and provides stored heat preventing the condensation of moisture at said face during the coating and drying operations. Such treatment not only facilitates deeper and more complete penetration of the cement into the leather but also insures that the adhesive bond shall be formed without the presence of moisture either initially present in the leather or deposited from a humid atmosphere.

It will be understood, moreover, that in many instances it is desirable to apply two coats of cement, first a priming or sizing coating and then a final coating, and that the surfaces to be cemented may be heated both before the application of the priming coating and before the application of the final coating.

While the application of my process to the manufacture of leather belting has been emphasized hereinabove, it will be understood that it has also a useful application in cementing together leather pieces in other industries, for example, in the shoemaking industry.

Having thus disclosed my invention and described in detail an illustrative manner of practicing it, I claim as new and desire to secure by Letters Patent:

1. A continuous method of preparing a strip of leather for adhesive bonding which includes the steps of roughening one face of the strip, feeding the strip along a predetermined path upon a supporting surface, subjecting the strip while in motion to the action of heat sufficient to raise its temperature above 100° F. while moving in a preliminary portion of said path, applying a coating of cement to the roughened face of the strip immediately following the heating operation, conjointly controlling both the feeding movement and the heating of the leather, and drying the coating of cement by moving the coated strip along a subsequent portion of the path.

2. The continuous method defined in claim 1, further characterized by the application of infra-red rays directed upon successive areas of the roughened face of the strip for a period of time approximating one and one-half minutes and at an intensity raising the temperature of the moving leather to approximately 110° F.

3. The continuous method of making multiply leather belting which includes the steps of advancing a single lap-jointed ply of belting leather along a horizontal path upon a supporting surface, subjecting the exposed face of the ply while in motion to infra-red rays as the ply enters said path, thereby evaporating moisture from the leather and storing up heat therein, applying a solvent-containing cement to the heated surface of the moving leather ply as it passes beyond the heating stage, conjointly controlling both the feeding movement and the heating of the leather, and continuing to advance the leather in the same horizontal path until the cement has dried, meanwhile maintaining the leather above the dew point of the surrounding atmosphere by the heat stored within it.

INGRAM DICKINSON.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,048,877	Rampichini	Dec. 31, 1912
1,325,075	Byers	Dec. 16, 1919
2,212,522	Hart	Aug. 27, 1940
2,361,527	Bacon	Oct. 31, 1944