March 9, 1971 O. R. BECHTOLD 3,568,330

TEMPERATURE MAINTAINING TRANSPORT ROLLS

Filed July 31, 1969

Fig. 1

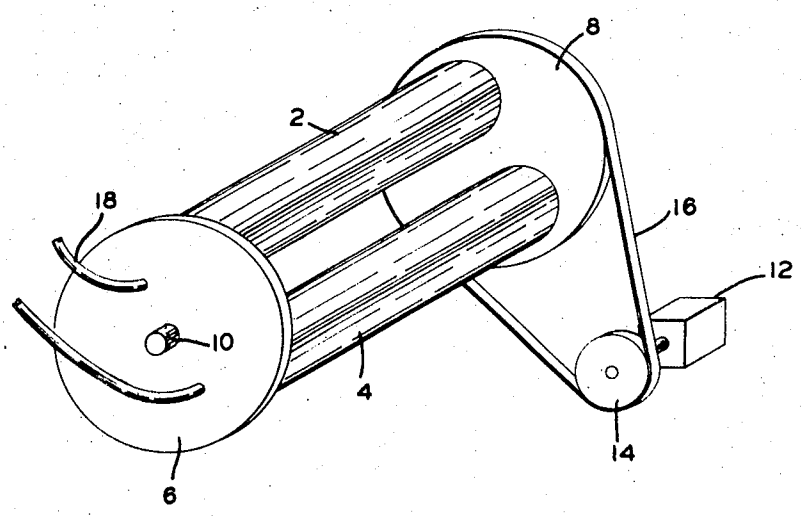


Fig. 2

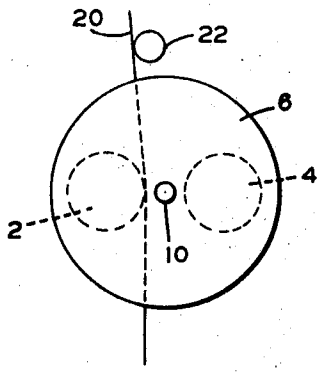


Fig. 3

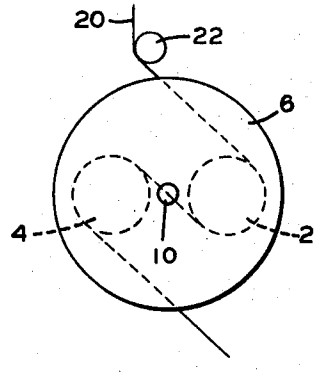
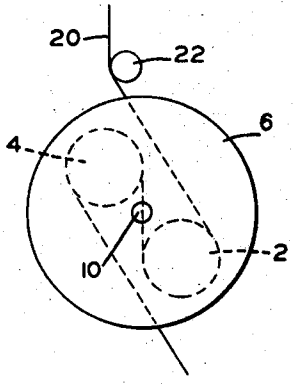


Fig. 4



INVENTOR
OLIVER R. BECHTOLD

BY

ATTORNEY

United States Patent Office 3,568,330 Patented Mar. 9, 1971

3,568,330

TEMPERATURE MAINTAINING TRANSPORT ROLLS

Oliver R. Bechtold, Lancaster, Pa., assignor to Armstrong Cork Company, Lancaster, Pa.

Filed July 31, 1969, Ser. No. 846,340
Int. Cl. F26b 11/02
U.S. Cl. 34—113 1 Claim

ABSTRACT OF THE DISCLOSURE

The apparatus involves two heated rolls which are suspended between two large end supports. The sheet which is heated by the rolls passes around the rolls. Depending upon the positioning of the rolls relative to the path of movement of the sheet, the amount of contact that the sheet makes with the rolls may be varied. This variation of contact with the rolls will cause variations in the temperature to which the sheet is heated. Movement of the rolls relative to the pathway of the sheet is affected by the end supports which are capable of movement to position the rolls in different positions.

BACKGROUND OF THE INVENTION

Field of the invention

This invention relates to an apparatus for regulating sheet material temperature and, more particularly, controlling the amount of contact that a sheet material has with a heated surface.

Description of the prior art

Variations in the temperature to which a sheet may be heated have been accomplished by several means. The simplest manner of accomplishing the above feature is by passing the sheet goods through a heater which raises it to the desired temperature. The feature of securing temperature variation in the sheet by means of varying the degree of contact with the heated surface has been recognized in Pat. No. 2,067,755. However, normally the variation in contact is secured by varying the position of the inlet guide roll and the outlet guide roll, which together determine the point at which the sheet material initially contacts the heated surface and the point at which the sheet material may leave the heated surface.

The apparatus herein utilizes the principle of securing temperature variation due to contact variation. However, the apparatus herein provides a device which has the ability to instantly alter the web tension by controlling the amount of web-wrap or sheet-wrap around the rolls.

SUMMARY OF THE INVENTION

The apparatus herein is two heated rolls around which the sheet material passes and a means for varying the amount of sheet-wrap around the rolls. The two rolls are mounted between large end supports which themselves are mounted for pivotal movement. The rolls are pivotally mounted on the end supports and are provided with connections to steam generators. Steam provides the rolls with the necessary heat, and the pivotal mounting of the rolls permits them to rotate as the web moves thereacross. Rotation of the end supports will cause rotation of the rollers relative to the general pathway which the sheet material will follow. Consequently, the sheet material could pass between the two rollers and contact only tangentially the surface of one roller. Rotation of the end supports, which will cause corresponding relative movement of the two rollers relative to the pathway of the sheet about an arc of 270°, can result in a situation where the sheet material will pass around both rollers and contact almost ¾ of the surface of both rollers. This then provides a device which has the ability to instantly alter the sheet temperature by controlling the amount of sheet-wrap around the rolls. Naturally, the longer the sheet is in contact with the heated rolls, the higher its temperature will be raised by the rolls.

BRIEF DESCRIPTION OF THE DRAWING

FIG. 1 is a schematic view of the apparatus herein, and FIGS. 2–4 are end views of the apparatus showing the various degrees of sheet-wrap around the rolls.

DESCRIPTION OF THE PREFERRED EMBODIMENT

The apparatus herein utilizes two rolls **2** and **4** which are pivotally mounted on end supports **6** and **8**. The rolls **2** and **4** are mounted for free rotation and rotate due to the drag of the sheet material moving against the rolls. The end supports **6** and **8** have bearings **10** which are placed on appropriate supports to carry the assembly of elements **2**, **4**, **6** and **8** and to permit rotation of elements **6** and **8**. A power supply means **12** drives a gear or sprocket **14** which is connected by a belt or chain **16** to one of the end supports to cause the end supports to rotate. The power supply means **12** is controlled by the operator of the machine, and the amount of rotation which is imparted to element **8** depends upon the degree of sheet-wrap around the rolls which it is desired to secure. Flexible lines **18** provide steam to the rollers **2** and **4** to place them in a heated condition.

Looking at FIG. 2, it can be seen that the sheet **20** passes between the two rolls **6** and only tangentially contacts roll **2**. This will provide minimum heating of the sheet **20**. Moving on to FIG. 3, it can be seen that the end support **6** has been rotated 180° in a clockwise direction. Now roll **2** is on the right of the drawing whereas in FIG. 2 it was on the left of the drawing. The sheet material **20** now passes around both rolls **2** and **4** and makes substantial contact with the rolls. The guide roll **22** is used to maintain a constant entry point for the sheet material into the apparatus herein.

Now referring to FIG. 4, it will be seen that end support **6** has been rotated almost 270° in the clockwise direction from the position shown in FIG. 2. The sheet material **20** now is in contact with almost ¾ of the surface area of both rolls **2** and **4**. This will provide the maximum contact of the sheet material with the rolls and, therefore, bring the sheet material to its highest temperature.

It is obvious that heating means other than steam could be provided to heat rolls **2** and **4**. Also, rolls **2** and **4** could be separately driven and function as drive rolls. In this case, the bearing **10** would not be used, and the end supports **6** and **8** would be supported on rollers for rotational movement. Basically, the apparatus provides a very simple structure for embodying the principle that the length of time of sheet contact with rolls determine the amount of heat transfer to the sheet so that a change in the relative position of the rolls can alter the roll contact time and, therefore, the temperature to which the sheet is heated.

What is claimed is:

1. An apparatus for providing various temperature heating of a sheet material comprising two end supports positioned for rotational movement, means for rotating the two end supports through an arc of approximately 270°, two heated roll means positioned between the end sup-

ports and pivoted to the end supports for rotational movement, said roll means being moved by rotational action of the end supports, means providing heat to the heated rolls and means guiding sheet material to the rolls so that sheet material may be heated to various temperatures depending upon the length of time the sheet material contacts the rolls and the amount of contact is dependent upon the relative position of the rolls relative to the pathway of the incoming sheet material.

References Cited

UNITED STATES PATENTS

2,067,755 1/1937 Dyer, Jr. ---------- 34—113

CHARLES SUKALO, Primary Examiner

U.S. Cl. X.R.

165—146