United States Patent [19]

Saunders et al.

[11] **3,897,191**

[45] **July 29, 1975**

[54] **MOUNTING MEMBER FOR PRINTING PLATE AND APPARATUS OF MAKING SAME**

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[73] Assignee: **Container Graphics Corporation,** Toledo, Ohio

[22] Filed: **Apr. 19, 1974**

[21] Appl. No.: **462,225**

Related U.S. Application Data

[62] Division of Ser. No. 345,573, March 28, 1973, abandoned.

[52] **U.S. Cl.** **425/384;** 101/415.1; 72/166; 425/500

[51] **Int. Cl.** **B29c 17/02**

[58] **Field of Search** 101/415.1; 425/384, 403, 425/383, 500; 72/166, 176

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Attorney, Agent, or Firm—Allen D. Gutchess, Jr.

[57] **ABSTRACT**

A mounting member for a printing plate and a method of making same are provided. The mounting member is made of a plastic sheet material which is solvent resistant, strong, dimensionally stable, conforms truly to the printing plate cylinder, and is of uniform thickness. A leading edge of the mounting member is turned back to form a structurally integral lip thereon which is readily connected to a flange on a printing plate cylinder. The integral lip is inexpensive to produce, requires no separate parts, and cannot loosen or pull off of the mounting member. The mounting member can be readily made by means of a table-top, heated, bending and forming apparatus through which the mounting member can be moved to bend and form the lip quickly and inexpensively.

4 Claims, 12 Drawing Figures

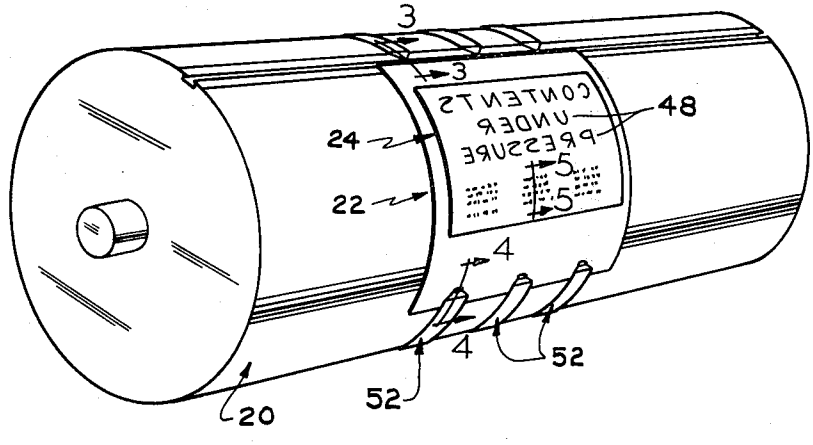
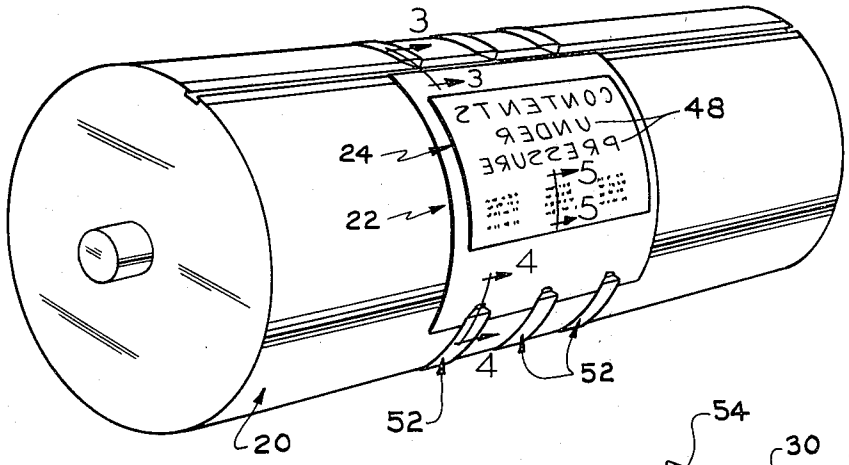


FIG. 1



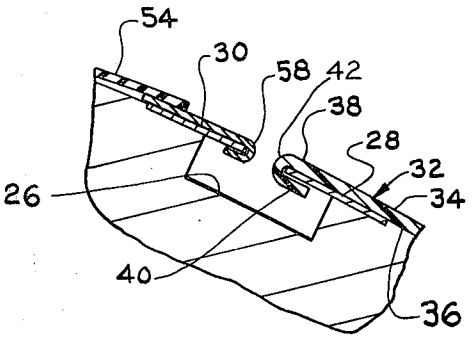


FIG. 3

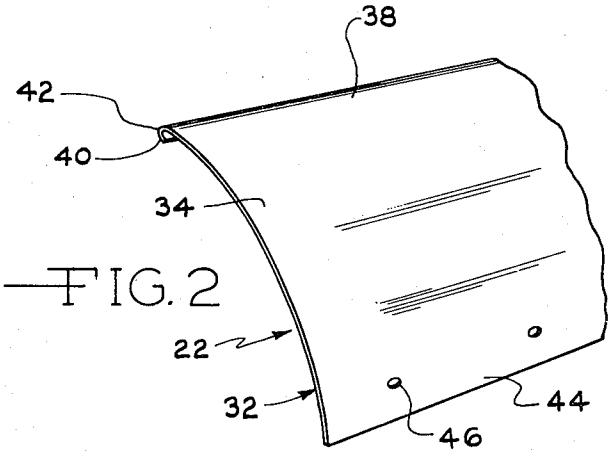


FIG. 2

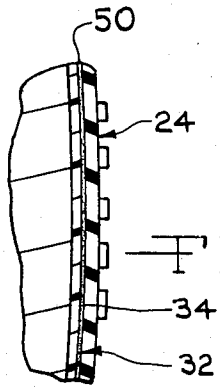


FIG. 5

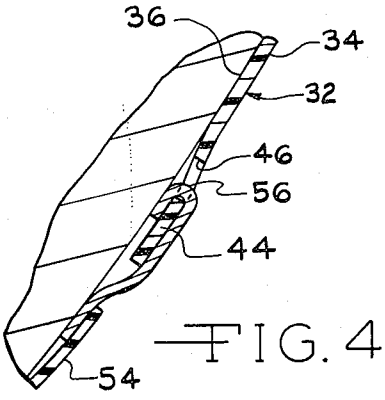
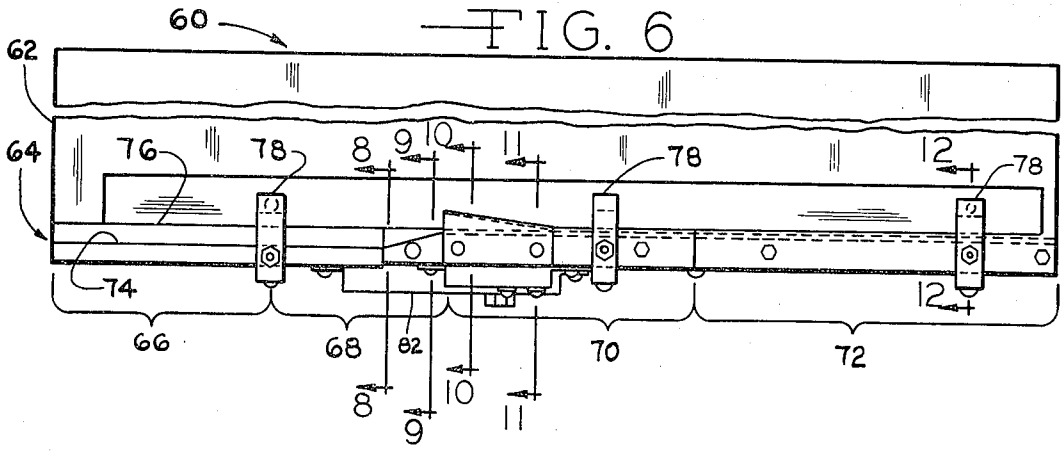


FIG. 4

FIG. 6



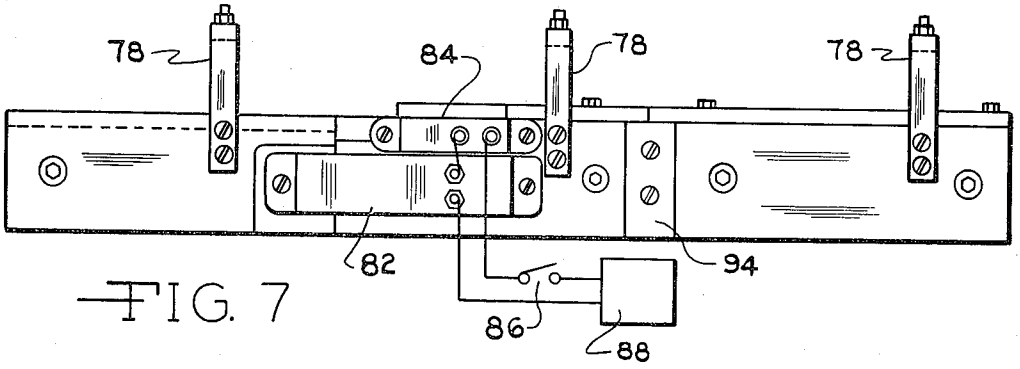


FIG. 7

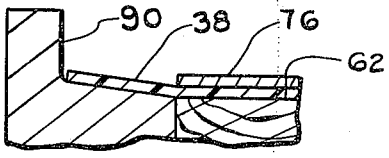


FIG. 8

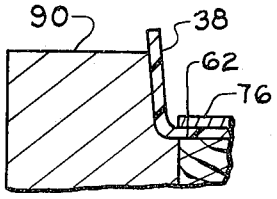


FIG. 9

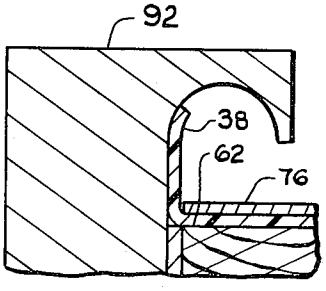


FIG. 10

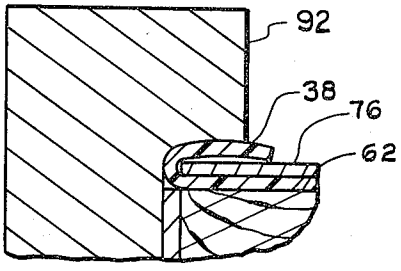


FIG. 11

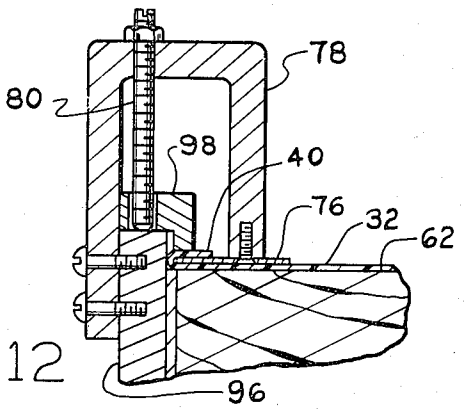


FIG. 12

MOUNTING MEMBER FOR PRINTING PLATE AND APPARATUS OF MAKING SAME

This a division, of application Ser. No. 345,573 filed Mar. 28, 1973, now abandoned.

This invention relates to a mounting member for printing plates and to a method for making same.

Mounting sheets for printing plates heretofore have been made of rubber-impregnated cloth or paper-plastic laminates. In order to produce mounting lips on such mounting sheets, separate elongate lip members had to be stapled or sewn to edges of the sheets. Such a lip member required separate parts which had to be inventoried, stored, etc. The elongate lip members also had to be cut to particular lengths in many instances, and required the additional step of stapling or otherwise affixing them to the mounting sheets. Such lip members also had a tendency to work loose from time to time during the printing operation, requiring a shut down.

The present invention provides a printing plate mounting member made of a plastic sheet material which is solvent resistant, strong, dimensionally stable, conforms truly to the plate cylinder, and is of uniform thickness. A mounting lip is provided on the leading edge of the mounting member which is structurally integral therewith. The lip is formed by sequentially heating the leading edge of the mounting member, sequentially bending it up and back on itself, and sequentially holding the bent portion while sequentially cooling the leading edge portion and lip to establish a permanent lip. The structurally-integral lip is low in cost to produce and is strong, not tending to pull away or loosen as separate lips heretofore employed. The integral lip also eliminates extra parts and extra labor required to cut separate lip members to proper length and affix them to the mounting sheet.

It is, therefore, a principal object of the invention to provide an improved mounting member for a rubber printing plate.

Another object of the invention is to provide a mounting member for printing plates having a structurally-integral lip formed thereon.

A further object of the invention is to provide a method of making a printing plate mounting member with a structurally-integral lip thereon.

Still another object of the invention is to provide a printing plate mounting member which is dimensionally stable, of uniform thickness, and strong.

Other objects and advantages of the invention will be apparent from the following detailed description of a preferred embodiment thereof, reference being made to the accompanying drawings, in which:

FIG. 1 is a view in perspective of a printing plate cylinder having a mounting member according to the invention fastened thereto and a printing plate affixed to the mounting member;

FIG. 2 is an enlarged fragmentary view in perspective of the mounting member of FIG. 1;

FIGS. 3–5 are detailed, sectional views taken along the lines 3—3, 4—4, and 5—5 of FIG. 1;

FIG. 6 is a fragmentary plan view of forming apparatus for producing the mounting member of FIGS. 1–5;

FIG. 7 is a view in elevation of the apparatus of FIG. 6; and

FIGS. 8–12 are enlarged, detailed views in transverse cross section taken along the lines 8—8, 9—9, 10—10, 11—11, and 12—12 of FIG. 6.

Referring to the drawings, and particularly to FIG. 1, a printing plate cylinder 20 has a mounting member or sheet 22 fastened thereto, with a rubber printing plate 24 mounted thereon. The assembly is used in a rotary printing press to print indicia on sheet material such as corrugated board which is directed between the printing plate cylinder 20 and another roll located thereunder (not shown). Typically, the cylinder 20 has a longitudinally-extending channel or groove 26 (FIG. 3) with a first mounting flange 28 affixed to the cylinder 20 in a flush manner with the flange extending over a portion of the channel 26. A second flange 30 is also affixed to the cylinder 20 in a flush manner and extends over another portion of the channel 26 toward the first flange 28.

Referring particularly to FIG. 2, the mounting member 22 comprises a single sheet 32 of plastic material of predetermined size and shape. The plastic material can be a general purpose, calendered, rigid polyvinyl chloride sheeting which is commercially available. The material can be obtained for example, from Tenneco Chemicals, Inc. under the designation V.C.H. 8001. Typically, the sheet is 0.030 inch thick with a variation of only ± 0.001 inch. However, the sheet also is available in a thickness of 0.050 inch which is suitable for the invention, with a thickness range of 0.020 – 0.070 inch being generally satisfactory. The sheet 32 has a front, convex surface 34 and a back, concave surface 36 and either can be formed with a fixed curve or can assume the curve of the cylinder 20 when mounted thereon.

A leading edge portion 38 of the sheet has a structurally-integral lip or flange 40 connected thereto by an intermediate, arcuate web 42. The lip 40 is generally parallel to the sheet 32 and is spaced therefrom by the web 42 a distance substantially equal to the thickness of the first flange 28. Along a trailing edge portion 44 of the mounting member 22, spaced means are provided for fastening resilient connecting means to mount the member 22 on the cylinder 20. These means in this instance are shown in the form of openings 46. The sheet 32 is sufficiently strong that the openings 46 can be employed without the necessity of using grommets therewith, as has been the case with mounting sheets heretofore known.

The printing plate 24 can be of molded rubber with suitable indicia indicated at 48 formed thereon. As shown in FIG. 5, the printing plate 24 can be mounted on the front surface 34 of the mounting member 22 by means of adhesive 50 or other suitable means.

Tension bands 52 constitute resilient connectors for affixing the mounting member 22 and the printing plate 24 on the cylinder 20. The tension bands 52 include resilient straps 54 to which first, narrow hooks 56 (FIG. 4) are suitably bonded or otherwise affixed, with the hooks received in the openings 46 in the mounting sheet 32. The tension bands also include broader metal hooks 58 (FIG. 3) at the opposite ends which are placed over the second flange 30 of the cylinder 20. The bands 52 are in tension and place the mounting member 22 in tension, with the leading edge lip 40 received on the first flange 28.

Referring more particularly to FIGS. 6 and 7, apparatus for forming the mounting member 22 is indicated at 60. Basically, the apparatus includes a non-metallic supporting base 62 and a metal edge portion 64 in which heating, bending, and cooling take place. The

edge portion **64** generally includes a first entry zone **66**, a preheating and initial forming zone **68**, a further heating and forming zone **70**, and a cooling zone **72**.

The sheet **32** is first positioned on the base **62** with the concave surface **36** up and with the edge of the leading edge portion **38** abutting a shoulder stop **74** in the first zone. The leading edge portion **38** of the sheet extends under a hold-down bar **76** which extends along the entire edge portion **64** and is adjustably positioned above the supporting base **62** by supporting brackets **78** having adjusting screws **80** (FIG. **12**) which can move the hold-down bar **76** up and down slightly relative to the base **62**. In the entry zone **66**, the sheet **32** essentially is just aligned with the metal portion **64**. In the initial heating and forming zone **68**, the sheet is initially heated to some extent by an electric heating element **82** which extends into both of the heating zones **68** and **70**. Temperature in the zones is controlled by a thermostat **84** connected in series with the heating element **82** and connected through a master switch **86** (FIG. **7**) to a power source **88**. In the first heating and forming zone **68**, the edge portion **38** of the sheet is bent to a generally vertical position by a heated forming block **90**, as shown in FIGS. **8** and **9**, heat being transferred through the forming block **90** from the element **82** to the sheet.

In the heating and forming zone **70**, the sheet is further heated by the element **82** and is bent back on itself by an overhead forming block **92**, as shown in FIGS. **10** and **11**. With this arrangement, the lip **40** and the web **42** assume the position as shown in FIGS. **2** and **3** by the time the sheet **32** reaches the end of the zone **70**.

The heating zone **70** and the cooling zone **72** are separated by an insulating block **94**, as shown in FIG. **7**, with the cooling zone **72** then being approximately at ambient temperature. The cooling zone **72** includes a main metal block **96** and a hold-down block **98** which maintain the sheet **32** in the desired position until the sheet is sufficiently cooled to retain the shape of the lip **40** and the web **42**. As the sheet is moved sequentially out of the cooling zone **72**, the lip is completed and is ready to be used as the mounting plate **22** for the printing plate **24**. With the mounting member **22** and the printing plate **24** assembled together, the mounting member **22** is mounted on the cylinder **20** with the aid of the tensioning bands **52** to render the cylinder **20** ready for operation.

Various modifications of the above-described embodiments of the invention will be apparent to those skilled in the art and it is to be understood that such modifications can be made without departing from the scope of the invention, if they are within the spirit and the tenor of the accompanying claims.

We claim:

1. Apparatus for making a mounting sheet for mounting a printing plate on a printing cylinder, said mounting sheet having a structurally-integral lip, said apparatus comprising means for supporting a heat-softenable plastic sheet of a given size and shape and having at least one straight edge, an entry zone having means for receiving and positioning the edge of the sheet, at least one heating and forming zone having means for heating the edge of the sheet and for bending the edge upwardly away from the plane of the sheet and rearwardly in a direction substantially parallel to the plane of the sheet to form the structurally-integral lip, and a cooling zone having means for cooling the bent edge of the sheet while maintaining the bent edge in its bent position.

2. Apparatus according to claim **1** characterized by means for insulating said heating means from said cooling means.

3. Apparatus according to claim **1** characterized by a hold-down bar extending substantially the length of said heating means and said cooling means, and adjustable means for supporting said hold-down bar and for moving said hold-down bar toward and away from said sheet supporting means.

4. Apparatus according to claim **1** characterized by an electric heating element for said heating means, and thermostat for maintaining said heating means at a selected temperature.

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