Oct. 3, 1967 A. M. POMORY 3,344,641

METHOD FOR TREATING SHEET METAL STRIP

Filed Aug. 11, 1965 2 Sheets-Sheet 1

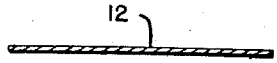

FIG.2

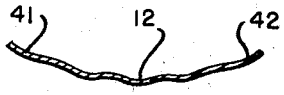

FIG.8

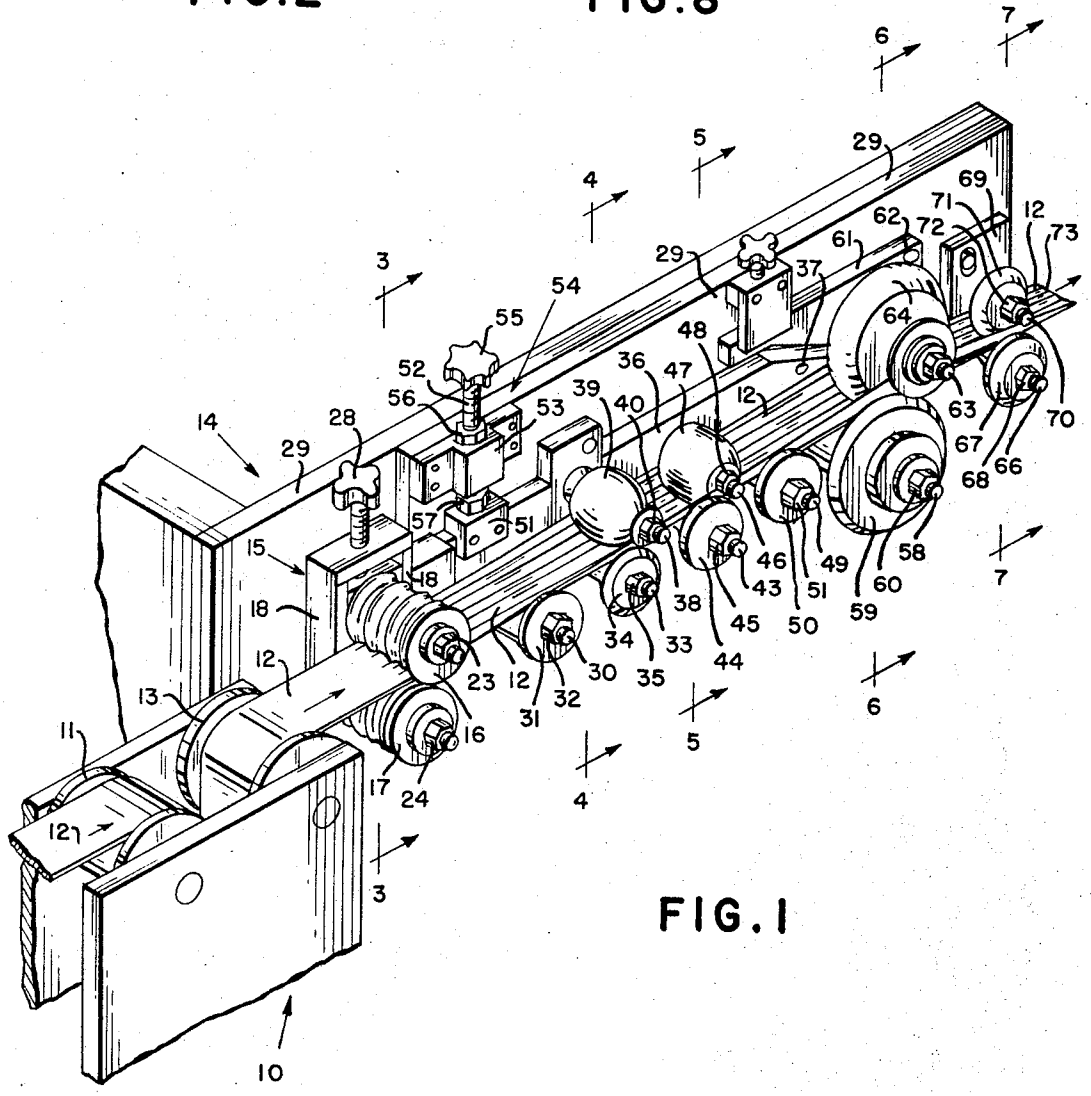

FIG.1

Oct. 3, 1967 A. M. POMORY 3,344,641

METHOD FOR TREATING SHEET METAL STRIP

Filed Aug. 11, 1965 2 Sheets-Sheet 2

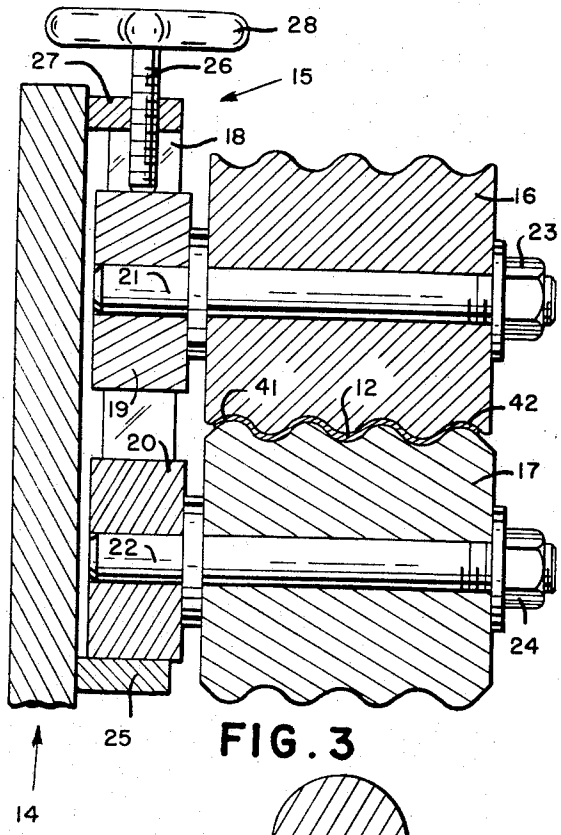

FIG. 3

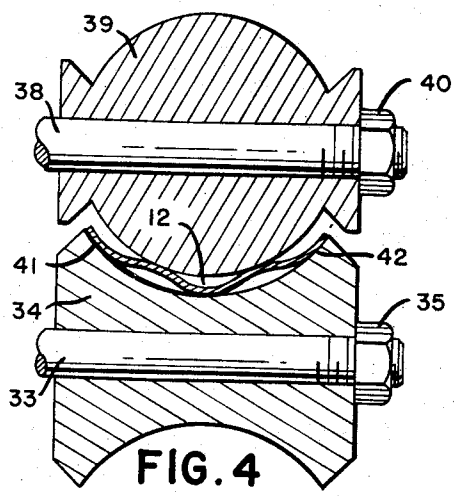

FIG. 4

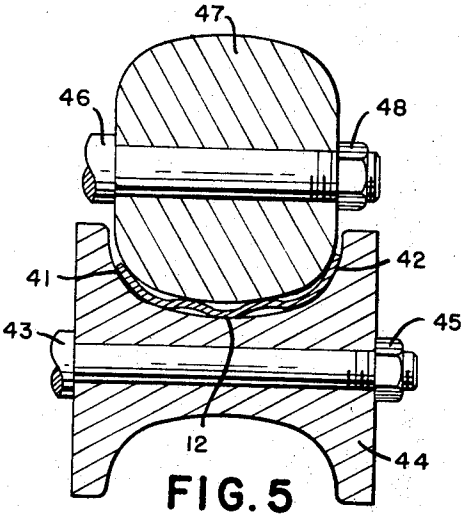

FIG. 5

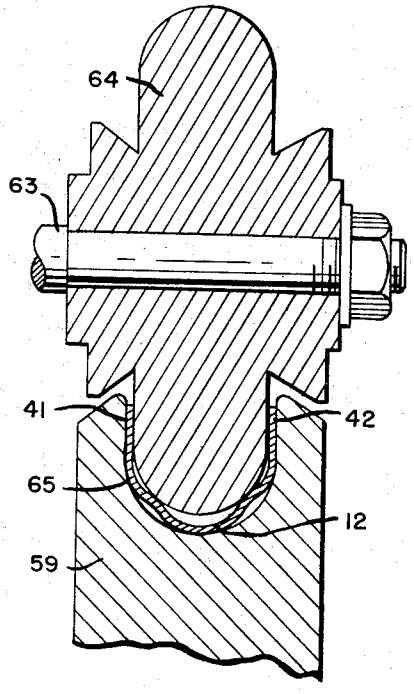

FIG. 6

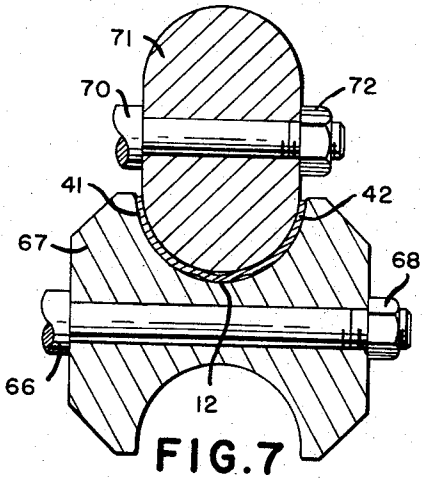

FIG. 7

United States Patent Office

3,344,641

Patented Oct. 3, 1967

3,344,641

METHOD FOR TREATING SHEET METAL STRIP

Alexander M. Pomory, Baltimore, Md., assignor to Eastern Products Corporation, Baltimore, Md., a corporation of Maryland

Filed Aug. 11, 1965, Ser. No. 478,810

10 Claims. (Cl. 72—177)

The present invention relates to Venetian blind slats and the like, and a method of and apparatus for preparing sheet metal strips therefor.

Modern Venetian blinds are usually made up of thin sheet metal strips, for example, in the neighborhood of 0.008 of an inch thick. This thin sheet metal strip as it is received from the mill includes uncontrollable distortions that must be removed before the strip can be used as a slat for a Venetian blind. Furthermore, the transverse contour of such strip material preferably is of a predetermined form in order to prevent transverse buckling of the slats and to impart to it sufficient stability so that it functions properly when employed as a Venetian blind slat.

Heretofore, apparatus has been provided for feeding the sheet metal strip, as it is received from the mill, through certain devices for subjecting the strip to certain stresses and counterstresses in order to relieve the distortions inherent in the strip material as it is received from the mill. Thereafter, the strip is fed through various forming rolls to impart to it a desired transverse contour that will enable the strip to function properly as a Venetian blind slat. These known methods, while generally successful, have not been wholly satisfactory with respect to slat strength and stability.

The principal object of this invention has been to provide strip sheet metal in a form that will overcome the above as well as other difficulties encountered with known strip sheet material.

Another object of the present invention has been to provide strip sheet material with longitudinally extending corrugations for imparting to the strip material adequate stability for its use as Venetian blind slats.

Another object of the invention has been to provide such longitudinally corrugated strip material having a desired transverse contour that will be suitable for Venetian blind slats.

Still another object of the invention has been to provide apparatus for subjecting the strip material to stresses and counterstresses at different transverse points and at intervals along the length of the strip material, which stresses and counterstresses equalize those between the center of the strip and the side edges to eliminate uncontrolled distortion of the strip.

Another object of the invention has been to provide such apparatus including a pair of grooved rollers through which the strip is passed, which rollers impart to the strip material longitudinally extending corrugations.

A further object of the invention has been to provide such an apparatus in which the strip material is passed between the transverse contouring rolls to provide the desired bow to the strip material so that it will be ideally suited for Venetian blind slats.

A still further object of the invention has been to provide such an apparatus that will operate on the strip material without in any way injuring its coating.

In one aspect of the invention, coated strip material as received from the mill is fed through a device which applies stresses and counterstresses transversely of the strip material as it is fed therethrough and at intervals longitudinally along the strip.

In another aspect of the invention, the strip material is fed between a pair of grooved rolls that are biased toward each other under a predetermined force, and

which rolls impart corrugations longitudinally of the strip.

In a further aspect of the invention, the strip material is successively fed between other grooved rollers that impart to it the transverse contour of predetermined design, while reducing the corrugated effect near the edges of the strip and at the same time retaining the corrugated effect in the longitudinal central area thereof.

In another aspect of the invention, the strip material is drawn through the apparatus by a force applied longitudinally of the strip at the exit of the apparatus.

Other and further objects, features and advantages of the invention will become apparent from the following description taken in connection with the appended drawings, in which:

FIG. 1 is a perspective view of apparatus to which the principles of the invention have been applied;

FIG. 2 is a section of the strip material as it is received from the mill;

FIG. 3 is a sectional elevational view through the corrugating rolls and taken substantially along line 3—3 of FIG. 1;

FIG. 4 is a sectional elevational view taken substantially along line 4—4 of FIG. 1;

FIG. 5 is a sectional view taken substantially along line 5—5 of FIG. 1;

FIG. 6 is a sectional elevational view taken substantially along line 6—6 of FIG. 1;

FIG. 7 is a sectional elevational view taken substantially along line 7—7 of FIG. 1; and

FIG. 8 is a sectional view through the finished strip material in its condition for use as Venetian blind slat material.

Referring to the drawings, and particularly to FIG. 1, the principles of the invention are shown as applied to apparatus including a unit **10** having a guide roll **11** adapted to guide the strip material **12** into the unit **10**. An outlet roll **13** guides the strip **12** as it leaves unit **10**. Unit **10** may be any one of a number of commercial items which are adapted to apply stresses and counterstresses transversely to the strip **12** and at intervals longitudinally therealong as the strip passes through unit **10**. The stresses and counterstresses are intended to relieve the strip **12** of the stresses inherent in the strip as it is received from the mill. One such device **10** is shown and described in U.S. Patent 2,717,625 to H. L. Johnson, granted Sept. 13, 1955, to which patent reference is directed for an understanding of the operation of the unit **10**. Unit **10** might also be constructed as shown in U.S. Patent 2,294,434 to A. B. Wilson.

A support **14** may have fixed to it a frame **15** in which are grooved rolls **16** and **17** between which the strip **12** passes. The rolls **16** and **17** are arranged so that the crests of one roll fit into the troughs of the other. Referring to FIG. 3, the frame **15** may include parallel side walls **18** between which journal blocks **19** and **20** may be mounted for supporting rods **21** and **22** on which the corrugated rolls **16** and **17** are journaled. Rolls **16** and **17** are retained on the rods **21** and **22** by nuts **23** and **24**. The block **20** is rigidly fixed to a bottom wall **25** of the frame **15**, and the block **19** is mounted for vertical reciprocation between the walls **18** of the frame **15**. Vertical adjustment of the block **19** and the grooved roll **16** may be effected by a threaded rod **26** that is threaded through the top wall **27** of the frame **15**. A handwheel **28** may be fixed to the threaded rod **26**, and its lower end may be connected to, or may act on the top of block **19**.

In the embodiment disclosed, the rolls **16** and **17** may include a plurality of grooves that mate with each other so that as strip **12** passes therebetween, it becomes corrugated longitudinally. While the roll **16** is shown as having four troughs and three crests, and the roll **17** is shown

as having three troughs and four crests, any number of troughs and crests may be employed to produce any number of corrugations longitudinally of strip **12**.

Referring again to FIG. 1, the support plate **14** may have attached to it another plate **29** for supporting other combinations of rolls to be described. A rod **30** may be fixed in plate **29** and it may extend transversely of strip **12**, beneath the same, and support an idler roller **31** which is held onto the rod **30** by a nut **32**.

Another rod **33** may be anchored in plate **29** and it also may extend transversely of the strip **12** and journal a concave roll **34** which is held on rod **33** by nut **35**. A bar **36** may be pivotally mounted to the plate **29** by pivot **37**, and it may support a threaded rod **38**, the axis of which is in a vertical plane passing through the axis of rod **33**. Rod **38** may journal a convex roller **39** which may be held on rod **38** by a nut **40**. Referring to FIG. 4, convex roll **39** may cooperate with the concave roll **34**, and as strip **12** passes therebetween, the outer corrugations **41** and **42** of strip **12** are reversely bent to reduce the corrugated appearance at the edges of strip **12**.

Another rod **43** may be anchored in plate **29**, and it may support a concave roller **44** held on rod **43** by nut **45**. A rod **46** may be attached to the bar **36**, and its axis may lie in the same vertical plane as that in which the axis of rod **43** lies. A convex roll **47** may be held onto the rod **46** by a nut **48**.

Referring to FIG. 5, the convex roll may fit into the concavity of the roll **44** in such a manner as to further relieve the severity of the corrugations near the outer edges **41** and **42** of the strip **12**. This is a further step in reducing the appearance of the corrugations while retaining the rigidity of the strip **12** by virtue of such corrugations.

Another rod **49** mounted on the plate **29** supports an idler concave roller **50** that is held on rod **49** by nut **51'**.

The bar **36** may include a shoe element **51** that is connected to one end of a screw **52** that is threaded into a block **53** of a bracket **54**, which latter is attached to plate **29**. A handwheel **55** is connected to the screw **52**, and the construction of the parts is such that rotation of the handwheel **55** causes arcuate movement of the bar **36** about the pivot **37** to vary the position of rolls **39** and **47** relative to their cooperating rolls **34** and **44**, respectively.

Nuts **56** and **57** act to lock the screw in vertically adjustable position when the desired spacing of the rolls **34**, **39** and **44**, **47** have been effected.

Another rod **58** may be anchored in the plate **29** and extends transversely of the strip **12**. Rod **58** may support a sharply grooved roller **59** that is held on shaft **58** by the nut **60**. A plate **61** may be pivotally attached to plate **29** by a pin **62**. It may support a rod **63** on which a roll **64** is mounted which closely fits the groove **65** within roll **59**.

Referring to FIG. 6, it is evident that the roll **64** further reduces the severity of the corrugations at the edges **41** and **42** of strip **12**, while retaining the severity of the corrugations within the center of the strip.

Another rod **66** may be anchored in the plate **29** and it may support a concave roll **67** held thereon by a nut **68**. A plate **69** may be adjustably mounted on the plate **29** and it may support a rod **70**, the axis of which lies in the same vertical plane as the axis of rod **66**. A convex roll **71** may be held on the rod **71** by a nut **72**. Referring to FIG. 7, it is noted that the roll **71** conforms very closely to the contour of the concave portion of roll **67** to further reduce the appearance of corrugations near the edges **41** and **42** of the strip **12**. In this instance, it is noted that the first two corrugations inwardly from each edge **41** and **42** are acted upon by the rolls **71** and **47**, while retaining the center portion of the strip **12** substantially in the manner in which it left the corrugating rolls **16**, **17**.

Movement of the strip **12** through the unit **10** and past the corrugating rolls **16**, **17**, as well as past the rolls **39**, **34**, **47**, **44**, **64**, **59**, **71** and **67** may be effected by applying a longitudinal pull in the direction of the arrow **73** (FIG. 1) which may be any means such as a drive applied to a winding roll on which the processed strip is wound preparatory to being fed to another machine for cutting into lengths and preparing the same for use as Venetian blind slats. Movement of the strip could also be effected by applying driving power to one of the forming rolls e.g., the roll **59**.

While the invention has been described in connection with a specific embodiment thereof and in a specific use, various modifications thereof will occur to those skilled in the art without departing from the spirit and scope of the invention as set forth in the appended claims.

What is claimed is:

1. The method of preparing relatively thin, narrow strip material for use as slats for Venetian blinds and the like, which comprises forming longitudinally extending corrugations along said strip material; and subsequently reducing the effect of said corrugations near the edges of said strip material while retaining said corrugations in the longitudinal central region of said strip material.

2. The method of preparing relatively thin, narrow strip metal for use as slats for Venetian blinds and the like, which comprises forming longitudinally extending corrugations along said strip metal; and subsequently reducing the effect of said corrugations near the edges of said strip metal while retaining said corrugations in the longitudinal central region of said strip metal.

3. The method of preparing relatively thin, narrow strip material for use as slats for Venetian blinds and the like, which comprises forming longitudinally extending corrugations along said strip material; and reducing the effect of said longitudinal corrugations near the edges of said strip material in stages while retaining said corrugations in the longitudinal central region of said strip material.

4. The method of preparing relatively thin, narrow strip metal for use as slats for Venetian blinds and the like, which comprises forming longitudinally extending corrugations along said strip metal; and reducing the effect of said longitudinal corrugations near the edges of said strip metal in stages while retaining said corrugations in the longitudinal central region of said strip metal.

5. The method of preparing relatively thin, narrow strip material for use as slats for Venetian blinds and the like, which comprises applying stresses and counterstresses at longitudinally spaced intervals along said strip material; and forming longitudinally extending corrugations along said strip material.

6. The method of preparing relatively thin, narrow strip metal for use as slats for Venetian blinds and the like, which comprises applying stresses and counterstresses at longitudinally spaced intervals along said strip metal; and forming longitudinally extending corrugations along said strip metal.

7. The method of preparing relatively thin, narrow strip material for use as slats for Venetian blinds and the like, which comprises applying stresses and counterstresses at longitudinally spaced intervals along said strip material; forming longitudinally extending corrugations along said strip material; and reducing the effect of the corrugations near the edges of said strip material while retaining the effect of said corrugations in the longitudinal central region of said strip material.

8. The method of preparing relatively thin, narrow strip metal for use as slats for Venetian blinds and the like, which comprises applying stresses and counterstresses at longitudinally spaced intervals along said strip metal; forming longitudinally extending corrugations alnog said strip metal; and reducing the effect of the corrugations near the edges of said strip metal while retaining the effect of said corrugations in the longitudinal central region of said strip metal.

9. The method of preparing relatively thin, narrow strip material for use as slats for Venetian blinds and the like, which comprises applying stresses and counter-

stresses at longitudinally spaced intervals along said strip material; forming longitudinally extending corrugations along said strip material; and reducing the effect of the corrugations in stages near the edges of said strip material while retaining the effect of said corrugations in the longitudinal central region of said strip material.

10. The method of preparing relatively thin, narrow strip metal for use as slats for Venetian blinds and the like, which comprises applying stresses and counter-stresses at longitudinally spaced intervals along said strip metal; forming longitudinally extending corrugations along said strip metal; and reducing the effect of the corrugations in stages near the edges of said strip metal

while retaining the effect of said corrugations in the longitudinal central region of said strip metal.

References Cited

UNITED STATES PATENTS

2,007,284	7/1935	Rafter	72—181
2,337,047	12/1943	Hunter	72—179
3,165,815	1/1965	Wogerbauer	72—179

RICHARD J. HERBST, *Primary Examiner.*

R. D. GREFE, *Assistant Examiner.*