(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 0 945 198 B1

(12) **EUROPEAN PATENT SPECIFICATION**

(45) Date of publication and mention of the grant of the patent:
10.12.2003 Bulletin 2003/50

(51) Int Cl.[7]: **B21H 8/00**, B21B 1/22

(21) Application number: **99302168.2**

(22) Date of filing: **19.03.1999**

(54) **Roll-patterned strip**

Durch Walzen gemustertes Band

Bande gaufrée obtenue par laminage

(84) Designated Contracting States:
DE GB NL

(30) Priority: **24.03.1998 EP 98200923**

(43) Date of publication of application:
29.09.1999 Bulletin 1999/39

(73) Proprietor: **HUNTER DOUGLAS INDUSTRIES B.V.**
3071 EL Rotterdam (NL)

(72) Inventor: **Eschauzier, Frans R.**
3335 EB Zwijndrecht (NL)

(74) Representative: **Smith, Samuel Leonard**
J.A. Kemp & Co.,
14 South Square,
Gray's Inn
London WC1R 5JJ (GB)

(56) References cited:
EP-A- 0 369 158
US-A- 3 955 261
US-A- 4 362 039
US-A- 4 499 938
US-A- 5 333 365
US-A- 5 354 581
US-A- 5 358 024
US-A- 5 552 235

Note: Within nine months from the publication of the mention of the grant of the European patent, any person may give notice to the European Patent Office of opposition to the European patent granted. Notice of opposition shall be filed in a written reasoned statement. It shall not be deemed to have been filed until the opposition fee has been paid. (Art. 99(1) European Patent Convention).

EP 0 945 198 B1

Printed by Jouve, 75001 PARIS (FR)

Description

[0001] This invention relates to a process of roll-patterning and then optionally painting a surface of a metal strip or sheet, particularly an aluminium strip or sheet used to form vanes or head or bottom rails for window covering assemblies, such as venetian blinds, or to form architectural panels for ceilings or wall coverings. This invention particularly relates to an optionally painted metal strip or sheet with a decorative pattern on at least one surface, made by the process, and to a window covering assemblies and architectural panels made from the strip or sheet.

[0002] Elongated vanes or slats of the type used in horizontal and vertical blinds are well known and commercially available. Such slats are formed, for example, by continuous casting of aluminium strips or sheets, subsequent milling and, if necessary, cutting to width to provide coils of aluminium strips having the desired thickness and width. Subsequently, the strips or sheets are painted (optional), then roll-formed and cut into slats of the desired length. Likewise, it is well known to roll-form and cut such strips or sheets into head and bottom rails and architectural panels.

[0003] Since window coverings and architectural products are frequently decorative, different colours and laminated or painted patterns are often provided on their exterior surfaces, particularly on the visible surfaces of slats and head and bottom rails of window coverings. In this regard, coiled strip, used to make blind slats, is normally covered with paint or lacquer in a coil-coating process in order to give it a decorative pattern before it is roll-formed into slats.

[0004] A pattern can then be rolled into the painted strip surface, so that the resulting indentations in the strip surface give it a fabric-like appearance. An example of a process and apparatus for providing such a pattern in a painted strip surface for foldable metal drape panels for vertical blinds is described in US patent 4,362,039 (Toti). In the process of his patent, a rotary die is used to produce continuous patterns of scribe lines in painted surfaces of strips. The scribe lines assist in subsequently forming a preselected cross-sectional profile of the metal drape panels. Another rotary die is used for subsequently forming patterns of embossments in the strips between the scribe lines, in order to begin to stretch and work the metal between the scribe lines, so as to make it easier thereafter to form a weave pattern. Two additional rotary cutting die stations then cut the male and female hinges of the drape panel, and then, a rotary weave die station produces weave patterns between the scribe lines. The weave patterns comprise relatively deep cuts which slice through the metal at the edges of the pattern and provide a raised area which imitates the ins and outs of woven threads of cloth. Unfortunately, these cuts tend to damage the paint on the strip surface and can result in premature corrosion of the metal.

[0005] US patent 4,499,938 (Toti) also describes a process and apparatus for making a metal blind slat by providing a relatively deeply embossed rib pattern in a painted strip material. The depth of the pattern is described as 0.381 mm 0.015 inch in a strip of 0.20 - 0.254 mm 0.008 - 0.010 inch thickness. This means that the depth of the pattern is more than the thickness of the strip, and so, the strip has been corrugated. Unfortunately, such an embossed pattern also inevitably tends to damage the paint on the strip and produce premature corrosion of the metal.

[0006] US 5,552.235, upon which the precharacterizing portion of appended claim 1 is based, describes an embossed cold rolled metal (e.g. steel) sheet for use in manufacturing appliances and method of makng same wherein the surface attributes of the embossed sheet are optimized to improve corrosion resistance of the painted product, promote uniform paint coverage of the sheet surface, reduce paint consumption, enable repainting without loss of pattern crispness, and provide consistent and aesthetically pleasing appearance of the painted sheet. The embossed sheet has a plurality of plateaus and impressions defined therein in a manner such that the arithmetic average surface roughness (Ra) of the plateaus is from about 1,27 - 2,54 micrometers (about 50 to 100 microinches), the maximum impression depths over a given area are from about 0,063 to 0,081 mm (about 0.0025 to 0.0032 inches), the impression walls define maximum slopes of from about 8-17 degrees, and there are no sharp corners or ridges at the transition points between plateaus and impressions.

[0007] US 3,955,261 describes a panel of nonferrous metal sheet for covering facings, particularly a panel consisting of aluminium metal sheet, characterized in that said panel has an embossed surface provided with irregular areal depressions predominantly having a width of at least 10mm and depth of 10 to 30%, preferably approximately 25%, of the greatest panel thickness, the total area of the depressions corresponding to 20 to 50%, preferably to approximately 25%, of the whole panel surface, and that the rear side of the panel is flat.

[0008] In accordance with this invention, a decorative roll-patterned metal strip or sheet, preferably an aluminium strip or sheet, is provided that has a thickness of about 0.05 - 1.0 mm, preferably about 0.1 - 0.8 mm, with a surface having a plurality of indentations of a depth of about 0.001 - 0.05 mm, preferably about 0.02 - 0.035 mm; the ratio of the depth of the indentations to the thickness of the strip or sheet being in the range of about 1: 5 to about 1: 100.

[0009] Preferably, the strip or sheet has a layer of a paint of a thickness of about 3 - 30 microns, preferably about 10 - 15 microns, on the surface and within its indentations. Preferably, the indentations form a pattern which covers substantially the entire surface of the strip or sheet and which is visible to the naked eye, even

when paint is within and atop the indentations.

[0010] Also in accordance with this invention, a process is provided for making the decorative roll-patterned metal strip, comprising the steps of:

- cold-rolling a metal strip or sheet, preferably an aluminum strip or sheet, at a temperature of about 40 - 175 C to reduce the thickness of the strip or sheet by about 15 - 40 %, preferably about 20 - 30 %, to about 0.05 - 1.0 mm, preferably about 0.1 - 0.8 mm, using a milling roll with a surface pattern thereon, to form a roll-patterned strip or sheet having, in a surface, a plurality of indentations corresponding to the surface pattern of the milling roll and with a depth of about 0.001 - 0.05 mm, preferably 0.02 - 0.035 mm; the ratio of the depth of the indentations to the thickness of the strip or sheet being in the range of about
  1: 5 to about 1: 100.

[0011] Preferably, the process further comprises the step of subsequently painting the surface of the roll-patterned strip or sheet with a thickness of about 3 - 30 microns, preferably about 10 - 15 microns, of paint on the surface and within its indentations.

[0012] Preferably, the cold-rolling step using the milling roll with the surface pattern is carried out in a last stand of a multi-stand cold-roll mill, and only the last stand has at least one of its milling rolls with the surface pattern. Subsequent painting of the strip or sheet is preferably carried out in a separate machine for coil-coating.

[0013] Further in accordance with this invention are provided vanes and head and bottom rails for window covering assemblies, such as venetian blinds, and architectural panels for ceilings or wall coverings made from the decorative roll-patterned strip or sheet of the invention.

[0014] Further aspects of the invention will be apparent from the detailed description below of particular embodiments and the drawings thereof, in which :

- Figure 1 shows a multi-stand cold roll mill, in which the last mill stand is a cold pattern-rolling mill stand in accordance with the invention.
- Figure 2 is a schematic top view of the rolling mill of Figure 1, showing the roll-patterned strip leaving the last mill stand.
- Figures 3A - 3C are schematic views of the last two stands of the rolling mill of Figure 1, showing the use of different patterning roll(s) at the last mill stand.
- Figure 4 is a schematic cross-section of a strip of the invention, which is roll-patterned on both sides.
- Figures 5A - 5E show different examples of roll-patterns of the invention.

[0015] Figure 1 shows a five-stand cold roll reducing mill 1 for milling and roll-patterning a strip or sheet, such as an aluminium strip 2, in accordance with this invention. The strip 2 enters the mill 1 still in a ductile state following conventional heating and quenching steps. The five stands 3, 5, 7, 9 and 11 of the mill 1 sequentially reduce the thickness of the aluminium strip 2 in a conventional manner by simultaneously pressing with opposed top and bottom, steel, milling or working rolls, generally 13 and 15, on the top and bottom surfaces 17 and 19 of the strip 2. However, the last stand 11 has one or both of its top and bottom, milling rolls 13A and 15A with patterned surfaces in contact with the strip 2 to provide roll-patterned indentations 21 in one or both of the adjacent surfaces 17 and 19 of the strip 2. During the cold rolling steps in stands 3 -11, the temperature of the strip 2 is generally 40° - 175°C, preferably 75° - 120°C.

[0016] The thickness of the strip 2 is preferably reduced in the last stand 11 by 15 - 40 %, preferably 20 -30%, to a thickness of 0.05 - 1.0 mm, preferably 0.1 - 0.8 mm., especially 0.1 - 0.3 mm for making slats and 0.4 - 0.7 for making head or bottom rails. At the same time, the top surface 17, the bottom surface 19 or both of the strip 2 are roll-patterned by the patterned surface of the adjacent top and/or bottom, milling rolls 13A and 15A of the last stand 11 as shown in Figures 3A -3C.

[0017] Preferably, the strip 2 is still in a ductile state when it reaches the last cold roll stand 11 so that it is easier to roll-pattern the surface of the strip to provide a plurality of indentations 21 therein to a depth of 0.001 - 0.05 mm, preferably 0.02 - 0.035 mm, with the ratio of the depth of the indentations 21 to the thickness of the strip 2 being in the range of 1: 5 to 1: 100. By the term "depth of indentations" is meant the depth of the indentations 21 in the strip 2 relative to the mean thickness of the strip 2 after roll-pressing in accordance with this invention. Preferably, the ratio of the depth of the indentations 21 to the thickness of the roll-patterned strip 2 is no more than 1:10, particularly no more than 1: 16, and no less than 1: 50, particularly no less than 1 : 40. The roll-patterning of this invention does not corrugate the strip 2 but takes place only on its surface, so that the so-formed indentations 21 are accommodated entirely within the thickness of the strip.

[0018] In accordance with the invention, a pattern C on the surface of either the top or bottom, milling roll 13A or 15A of the last stand 11 can be rolled only into the adjacent top or bottom surface 17 or 19 of the strip 2 (Figure 3A). This is often preferred for a strip 2 that is later to be roll-formed in a conventional manner into head or bottom rails for window covering assemblies or into architectural panels. Likewise, a pattern C on the surface of both the top and bottom, milling rolls 13A and 15A of the last stand 11 can be rolled simultaneously into both the adjacent top and bottom surfaces 17 and 19 of the strip 2 (Figure 3B). This is often preferred for a strip 2 that is later to be roll-formed into horizontal or vertical slats for window covering assemblies which have both sides visible in use. Similarly, a pattern C on the surface of top milling roll 13A of the last stand 11 can

be rolled into the adjacent top surface 17 of the strip 2, and a different pattern D on the surface of the bottom milling roll 15A of the last stand 11 can simultaneously be rolled into the adjacent bottom surface 19 of the strip 2 (Figure 3C).

[0019] Figure 2 shows the five-stand cold roll reducing mill 1 from above. The strip 2 enters at stand 3 and is milled through stands 3-11. The last stand 11 is the cold mill stand with one or two patterned milling rolls 13A and/or 15A. Strip 2 exits stand 11 with pattern C from the patterned rolls on its surface and is then led to roll-up stand 23.

[0020] Figure 3A shows cold mill stand 9 and its pair of conventional milling rolls 13 and 15 and cold mill stand 11 and its pair of a top milling roll 13A with pattern C on its surface and a conventional bottom milling roll 15. The thickness of strip 2 is reduced in stand 11, and it exits stand 11 with the pattern C on its top surface 17.

[0021] Likewise, Figure 3B shows cold mill stand 9 and its pair of conventional milling rolls 13 and 15 and cold mill stand 11 and its pair of a top milling roll 13A and bottom milling roll 15A, both with pattern C on their surfaces. The thickness of strip 2 is reduced in stand 11, and it exits stand 11 with the pattern C on its top and bottom surfaces 17 and 19.

[0022] Likewise, Figure 3C shows cold mill stand 9 and its pair of conventional milling rolls 13 and 15 and cold mill stand 11 and its pair of a top milling roll 13A with pattern C on its surface and a bottom milling roll 15A with pattern D on its surface. The thickness of strip 2 is reduced in stand 11, and it exits stand 11 with the pattern C on its top surface 17 and the pattern D on its bottom surface 19.

[0023] Figure 4 is a cross-section of a roll-patterned strip 2 of this invention as made, for example, in the mill stand 11 of Figure 3A. Figure 4 shows that the cold roll-patterning process, carried out in mill stand 11, does not corrugate the strip 2. Strip 2, has pattern C on the top surface 17 and a different pattern D on the bottom surface 19. The depth of the indentations 21 of each roll-pattern C and D is between 0.001 and 0.05 mm and preferably between 0.02 and 0.035 mm. As a result, each surface 17 and 19 can be painted, using conventional coating rollers and heat-curing techniques of coil-coating processes, without losing the appearance of its roll-pattern C or D.

[0024] Figures 5A -5E show examples of some of the different roll-patterns that can be provided on the surface(s) of strip 2. In fact, there is an endless variety of possible patterns. Changing the pattern simply entails putting in a differently patterned milling roll 13A or 15A in the last stand 11 of the cold rolling multi-stand mill 1. Figure 5A shows a lattice-like pattern. Figure 5B shows a fish-grate wavy like pattern. Figures 5C and 5E show lettering patterns. Figure 5D shows a figurine-like pattern.

[0025] After roll-patterning, the strip 2 can be rolled up in a conventional manner on roll 23 and allowed to cool. The roll-patterned surface(s) 17 and or 19 of the strip 2 can then be painted in a conventional manner with a thickness of 3 - 30 microns, preferably 10 - 15 microns, of paint on the surface(s) and within the indentations 21. In this regard, each roll-patterned surface 17 and/or 19 of the strip 2 can be passed over a conventional paint applicator roller as described in the patent publications: EP 0 070 705 and U.S. 3 068 119.

[0026] Finally, the painted strip 2 can be roll-formed in a conventional manner to form elongated horizontal or vertical slats or head or bottom rails for window covering assemblies, such as venetian blinds, or to form architectural panels for ceilings or wall coverings. In this regard, the painted and roll-patterned 2 can be passed between conventional forming rolls as described in the patent publications: U.S. 4 173 879, U.S. 4 145 905, U. S. 3 26724, U.S. 2 692 003, U.S. 2 518 846, U.S. 2 471 490, U.S. 2 346 990 and U.S. 2 313 111.

[0027] This invention is, of course, not limited to the above-described embodiments which may be modified within the scope of the claimed invention. In this regard, the terms in the foregoing description and the following claims, such as "horizontal", "vertical", "top" and "bottom", have been used only as relative terms to describe the relationships of the various elements of the cold roll reducing mill 1 of the invention.

Claims

1. A decorative roll-patterned metal strip or sheet (2) **characterized in that**:

   the strip or sheet is preferably aluminium strip or sheet and has a thickness of about 0.05 - 1.0 mm, preferably about 0.1 - 0.8 mm, with a surface (17,19) having a plurality of indentations (21) of a depth of about 0.001 - 0.05 mm, preferably about 0.02 - 0.035 mm; the ratio of the depth of the indentations (21) to the thickness of the strip or sheet (2) being in the range of about 1: 5 to about 1: 100.

2. The strip or sheet of claim 1 having a layer of a paint of a thickness of about 3 - 30 microns, preferably about 10 - 15 microns, on the surface and within its indentations (21)

3. The strip or sheet of claim 1 wherein the indentations (21) form a pattern (C,D) which covers substantially the entire surface (17,19) of the strip or sheet (2) and which is visible to the naked eye, even when paint is on the surface and within its indentations (21).

4. A process for making the strip of claim 1, 2 or 3 comprising the step of:

- cold-rolling (13,15) a metal strip or sheet (2), preferably an aluminum strip or sheet, at a temperature of about 40° - 175°C to reduce the thickness of the strip or sheet (2) by about 15 - 40 %, preferably about 20 - 30 %, to about 0.05 - 1.0 mm, preferably about 0.1 - 0.8 mm, using a milling roll (13A,15A) with a surface pattern (C,D) thereon, to form a roll-patterned strip or sheet (2) having, in a surface (17,19), a plurality of indentations (21) corresponding to the surface pattern (C,D) of the milling roll (13A,15A) and with a depth of about 0.001 - 0.05 mm, preferably about 0.02 - 0.035 mm; the ratio of the depth of the indentations (21) to the thickness of the strip or sheet (2) being in the range of about 1: 5 to about 1: 100.

5. The process of claim 4 further comprising the step of:

subsequently painting the surface of the roll-patterned strip or sheet (21) with a thickness of about 3 - 30 microns, preferably 10 - 15 microns, of paint on the surface and within its indentations.

6. The process of claim 4 or 5 wherein the cold-rolling step using the milling roll with the surface pattern (C,D) is carried out in a last stand (11) of a multi-stand cold-roll mill (3,5,7,9,11), and only the last stand (11) has at least one of its milling rolls (13A, 15A) with the surface pattern (C,D).

7. The process of claim 6 wherein the strip or sheet (2) is in a ductile state in the last stand (11).

8. The process of claim 7 wherein the temperature of the strip or sheet (2) in the last stand (11) is about 75°-120°C.

9. The process of any one of claims 4 - 8 wherein the pattern (C) is rolled on only one surface (17) of the strip or sheet (2).

10. The process of any one of claims 4 - 8 wherein the pattern (C) is rolled on both surfaces (17,19) of the strip or sheet (2).

11. The process of any one of claims 4 -10 wherein the ratio of the depth of the indentations (21) to the thickness of the roll-patterned strip or sheet (2) is no more than about 1:10, preferably no more than about 1: 16.

12. The process of any one of claims 4 - 11 wherein the ratio of the depth of the indentations (21) to the thickness of the roll-patterned strip or sheet (2) is at least about 1: 50, preferably at least about 1 : 40

13. A vane for a window covering assembly including the roll-patterned strip or sheet (2) of any one of claims 1, 2 or 3.

14. A head rail or bottom rail for a window covering assembly including the roll-patterned strip or sheet (2) of any one of claims 1, 2 or 3.

15. An architectural panel for a ceiling or wall covering including the roll-patterned strip or sheet (2) of any one of claims 1, 2 or 3.

Patentansprüche

1. Dekoratives, durch Walzen gemustertes Metallband oder -blech (2), **dadurch gekennzeichnet, daß**
das Band oder Blech vorzugsweise Aluminiumband oder -blech ist und eine Dicke von etwa 0,05 bis 1,0 mm, vorzugsweise etwa 0,1 bis 0,8 mm hat und eine Oberfläche (17, 19) hat, die mit einer Vielzahl von Einkerbungen (21) von einer Tiefe von etwa 0,001 bis 0,05 mm, vorzugsweise etwa 0,02 bis 0,035 mm, versehen ist, wobei das Verhältnis zwischen der Tiefe der Einkerbungen (21) und der Dicke des Bands oder Blechs (2) im Bereich von etwa 1:5 bis etwa 1:100 liegt.

2. Band oder Blech gemäß Anspruch 1, mit einer Lackschicht von einer Dicke von etwa 3 bis 30 Mikron, vorzugsweise etwa 10 bis 15 Mikron auf der Oberfläche und innerhalb der Einkerbungen (21) darin.

3. Band oder Blech gemäß Anspruch 1, bei dem die Einkerbungen (21) ein Muster (C, D) bilden, welches im wesentlichen die gesamte Oberfläche (17, 19) des Bands oder Blechs (2) bedeckt und welches mit bloßem Auge erkennbar ist, selbst wenn Lack auf der Oberfläche und innerhalb der Einkerbungen (21) darin aufgebracht ist.

4. Verfahren für die Herstellung des Bands gemäß Anspruch 1, 2 oder 3, umfassend die folgenden Schritte:

Kaltwalzen (13,15) eines Metallbands oder -blechs (2), vorzugsweise eines Aluminiumbands oder -blechs, bei einer Temperatur von etwa 40° bis 175°C zur Verringerung der Dicke des Bands oder Blechs (2) um etwa 15 bis 40 %, vorzugsweise etwa 20 bis 30 %, auf etwa 0,05 bis 1,0 mm vorzugsweise etwa 0,1 bis 0,8 mm, unter Verwendung einer Arbeitswalze (13A, 15a) mit ei nem darauf befindlichen Oberflächenmuster (C, D) zur Ausbildung eines durch Walzen gemusterten Bands oder Blechs (2), welches in einer Oberfläche (17, 19) eine

Vielzahl von Einkerbungen (21) hat, die dem Oberflächenmuster (C, D) der Arbeitswalze (13A, 15A) entsprechen und eine Tiefe von etwa 0,001 bis 0,05 mm, vorzugsweise etwa 0,02 bis 0,035 mm haben; wobei das Verhältnis zwischen der Tiefe der Einkerbungen (21) zur Dikke des Bands oder Blechs (2) im Bereich von etwa 1:5 bis etwa 1:100 liegt.

5. Verfahren gemäß Anspruch 4, weiter umfassend den Schritt des:

nachträglichen Lackierens des durch Walzen gemusterten Bands oder Blechs (2) durch Aufbringen einer Lackschicht in einer Dicke von etwa 3 bis 30 Mikron, vorzugsweise 10 bis 15 Mikron, auf der Oberfläche und innerhalb der Einkerbungen darin.

6. Verfahren gemäß 4 oder 5, bei dem der Schritt des Kaltwalzens mit der mit dem Oberflächenmuster (C, D) versehenen Arbeitswalze in einem letzten Gerüst (11) eines mehrgerüstigen Walzwerks (3, 5, 7, 9, 11) durchgeführt wird und nur beim letzten Gerüst (11) zumindest eine der Arbeitswalzen (13A, 15A) mit einem Oberflächenmuster (C, D) versehen ist.

7. Verfahren gemäß Anspruch 6, bei dem sich das Band oder Blech (2) im letzten Gerüst (11) in einem duktilen Zustand befindet.

8. Verfahren gemäß Anspruch 7, bei dem die Temperatur des Bands oder Blechs (2) im letzten Gerüst (11) etwa 75°C bis 120°C beträgt.

9. Verfahren nach einem der Ansprüche 4 bis 8, bei dem das Muster (C) nur auf einer Oberfläche (17) des Bands oder Blechs (2) aufgewalzt wird.

10. Verfahren nach einem der Ansprüche 4 bis 8, bei dem das Muster (C) auf beiden Oberflächen (17, 19) des Bands oder Blechs (2) aufgewalzt wird.

11. Verfahren nach einem der Ansprüche 4 bis 10, bei dem das Verhältnis der Tiefe der Einkerbungen (21) zur Dicke des durch Walzen gemusterten Bands oder Blechs (2) nicht mehr als etwa 1:10, vorzugsweise nicht mehr als etwa 1:16 beträgt.

12. Verfahren nach einem der Ansprüche 4 bis 11, bei dem das Verhältnis der Tiefe der Einkerbungen (21) zur Dicke des durch Walzen gemusterten Bands oder Blechs (2) mindestens etwa 1:50, vorzugsweise mindestens etwa 1:40 beträgt.

13. Lamelle für eine Fensterabdeckung, welche das durch Walzen gemusterte Band oder Blech (2) nach einem der Ansprüche 1, 2 oder 3 umfaßt.

14. Kopf- oder Bodenschiene für eine Fensterabdekkung, welche das durch Walzen gemusterte Band oder Blech (2) nach einem der Ansprüche 1, 2 oder 3 umfaßt.

15. Bauliche Platte für eine Decke oder Wandabdekkung, weiche das durch Walzen gemusterte Band oder Blech (2) nach einem der Ansprüche 1, 2 oder 3 umfaßt.

Revendications

1. Bande ou feuille métallique décorative (2) gaufrée par laminage, **caractérisée en ce que** :
la bande ou feuille est de préférence une bande ou feuille d'aluminium et a une épaisseur d'environ 0.05 - 1.0 mm, de préférence d'environ 0.1 - 0.8 mm avec une surface (17, 19) comportant une pluralité d'indentations (21) d'une profondeur d'environ 0.001 - 0.05 mm, de préférence d'environ 0.02 - 0.035 mm ; le rapport de la profondeur des indentations (21) à l'épaisseur de la bande ou de la feuille (2) étant dans la gamme d'environ 1:5 à environ 1: 100.

2. Bande ou feuille de la revendication 1 comportant une couche de peinture d'une épaisseur d'environ 3 - 30 microns, de préférence d'environ 10 - 15 microns, sur la surface et à l'intérieur de ses indentations (21).

3. Bande ou feuille de la revendication 1, dans laquelle les indentations (21) forment un motif (C, D) qui recouvre sensiblement toute la surface (17, 19) de la bande ou feuille (2) et qui est visible à l'oeil nu, même lorsqu' il y a de la peinture sur la surface et à l'intérieur des indentations (21).

4. Procédé de fabrication de la bande de la revendication 1, 2 ou 3 comprenant l'étape consistant à :

- laminer à froid (13, 15) une bande ou feuille métallique (2), de préférence une bande ou feuille d'aluminium, à une température d'environ 40° - 175°C afin de réduire l'épaisseur de la bande ou feuille métallique (2) d'environ 15 - 40%, de préférence d'environ 20 - 30%, pour atteindre une valeur d'environ 0.05 - 1.0 mm, de préférence d'environ 0.1 - 0.8 mm, en utilisant un rouleau de laminage (13A, 15A) avec un motif de surface (C, D), afin de former une bande ou feuille (2) gaufrée par laminage dont une surface (17, 19) comporte une pluralité d'indentations (21) correspondant au motif de surface (C, D) du rouleau de laminage (13A, 15A) et ayant une profondeur d'environ 0.001
- 0.05 mm, de préférence d'environ 0.02 - 0.035

mm ; le rapport de la profondeur des indentations (21) à l'épaisseur de la bande ou feuille (2) étant dans la gamme d'environ 1:5 à environ 1:100.

5. Procédé de la revendication 4, comprenant en outre l'étape consistant à :

- peindre ensuite la surface de la bande ou feuille (21) gaufrée par laminage avec une épaisseur de peinture, à la surface et à l'intérieur des indentations, d'environ 3 - 30 microns, de préférence 10 - 15 microns.

6. Procédé de la revendication 4 ou 5, dans lequel l'étape de laminage à froid utilisant le rouleau de laminage avec le motif de surface (C, D) est réalisée dans la dernière station (11) d'un laminoir à froid à stations multiples (3, 5, 7, 9, 11), et seule la dernière station (11) comporte au moins un de ses rouleaux de laminage (13A, 15A) avec le motif de surface (C, D).

7. Procédé de la revendication 6, dans lequel la bande ou feuille (2) se trouve dans un état ductile dans la dernière station (11).

8. Procédé de la revendication 7, dans lequel la température de la bande ou feuille (2) dans la dernière station (11) est d'environ 75° - 120°C.

9. Procédé de l'une quelconque des revendications 4 - 8, dans lequel le motif (C) est laminé sur une seule surface (17) de la bande ou de la feuille (2).

10. Procédé de l'une quelconque des revendications 4 - 8, dans lequel le motif (C) est laminé sur les deux surfaces (17, 19) de la bande ou feuille (2).

11. Procédé de l'une quelconque des revendications 4 - 10, dans lequel le rapport de la profondeur des indentations (21) à l'épaisseur de la bande ou feuille (2) gaufrée par laminage n'est pas supérieur à environ 1:10, de préférence pas supérieur à environ 1:16.

12. Procédé de l'une quelconque des revendications 4 - 11, dans lequel le rapport de la profondeur des indentations (21) à l'épaisseur de la bande ou feuille (2) gaufrée par laminage est d'au moins 1:50 environ, de préférence d'au moins 1:40 environ.

13. Lame pour un ensemble couvrant une fenêtre, incluant la bande ou feuille (2) gaufrée par laminage de. l'une quelconque des revendications 1, 2 ou 3.

14. Rail de tête ou rail inférieur pour un ensemble recouvrant une fenêtre, incluant la bande ou feuille (2) gaufrée par laminage de l'une quelconque des revendications 1, 2 ou 3.

15. Panneau architectural pour un ensemble recouvrant un plafond ou une paroi, incluant la bande ou feuille (2) gaufrée par laminage de l'une quelconque des revendications 1, 2 ou 3.

Fig.1.

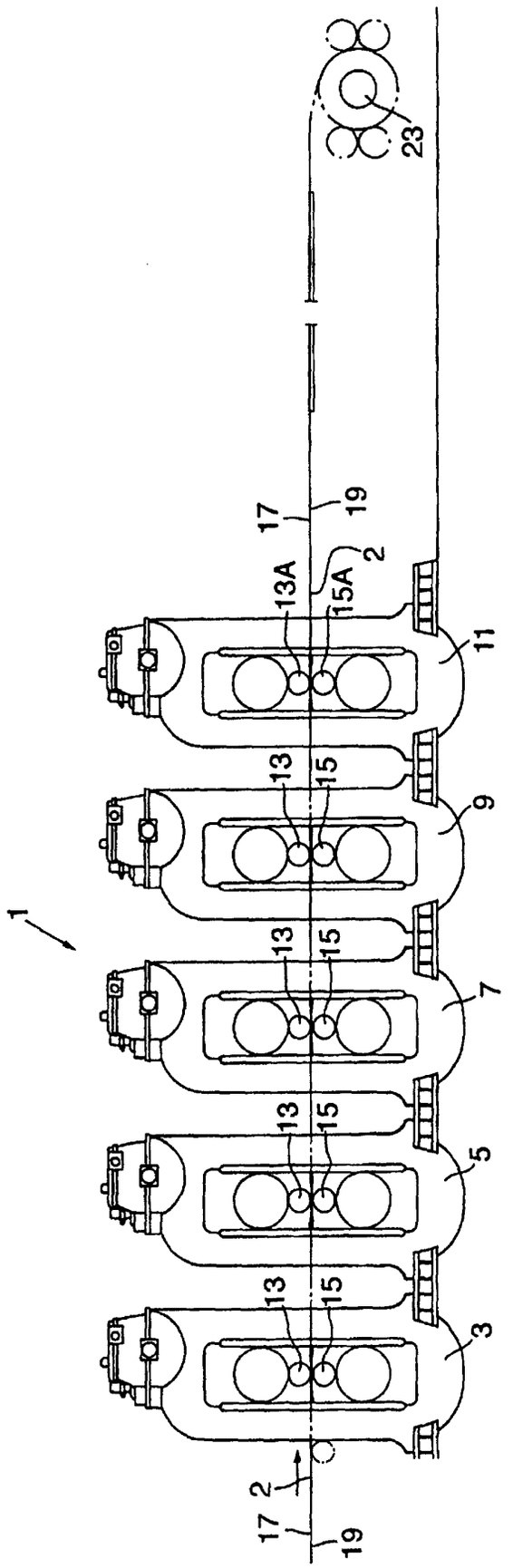


Fig.2.

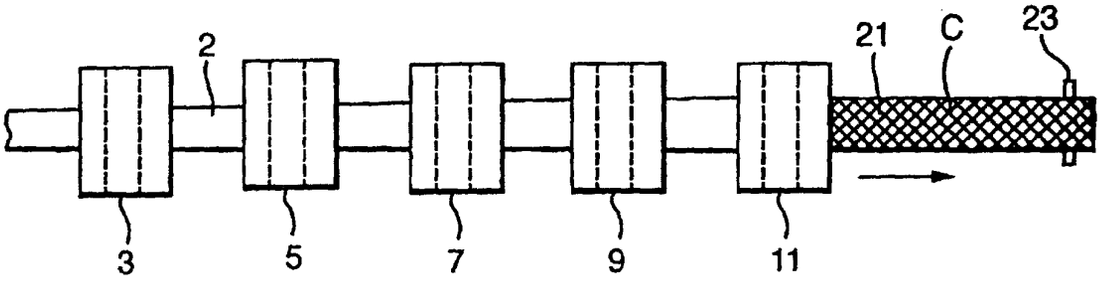


Fig.3A.

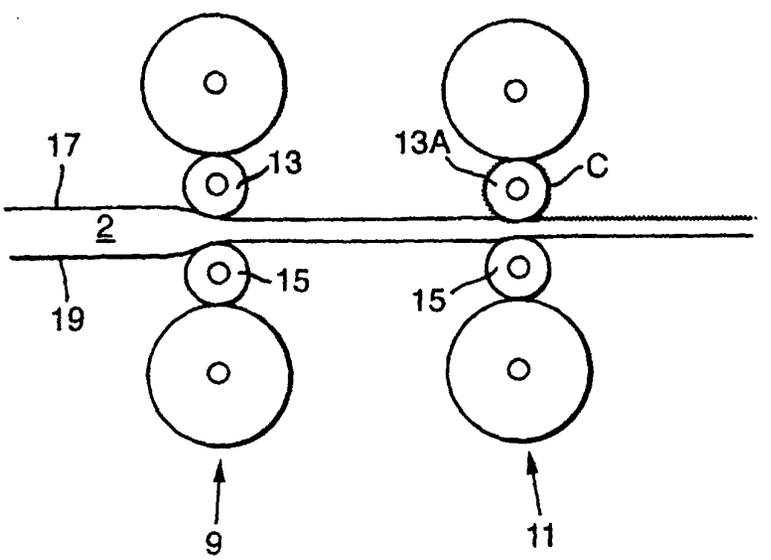


Fig.3B.

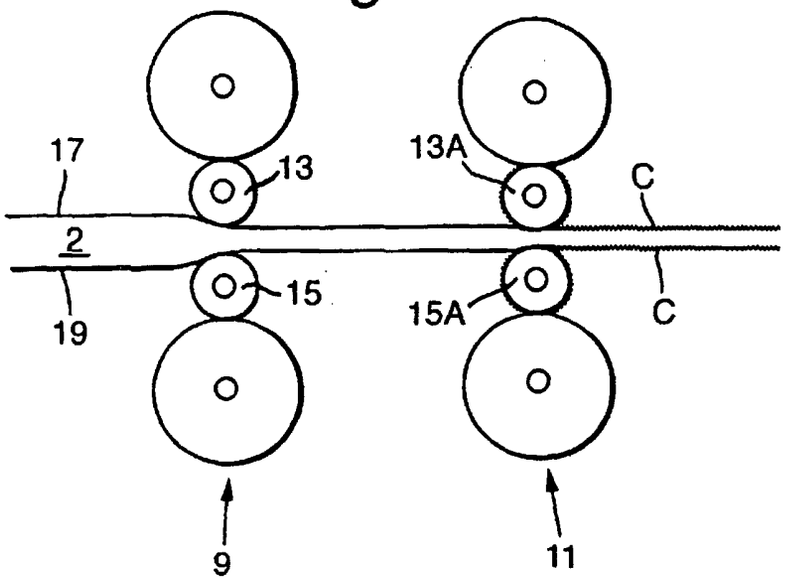


Fig.3C.

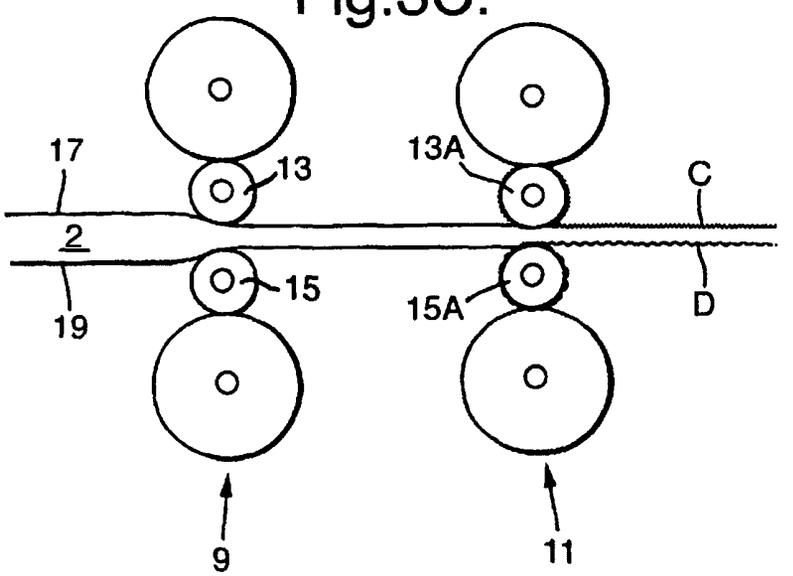


Fig.4.

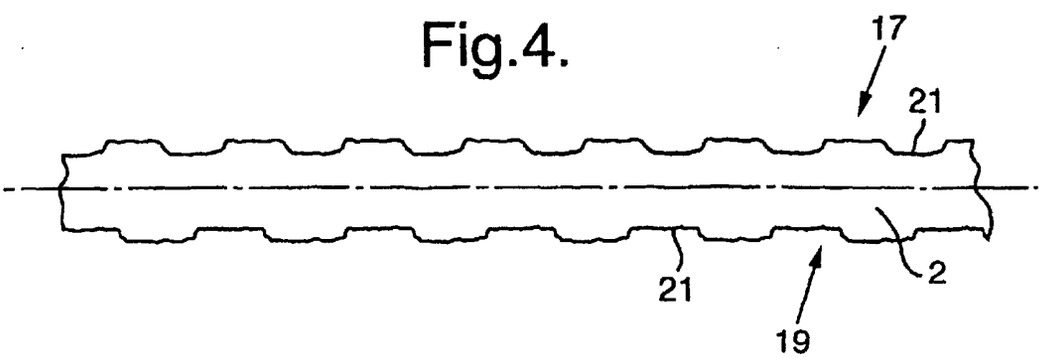


Fig.5A.

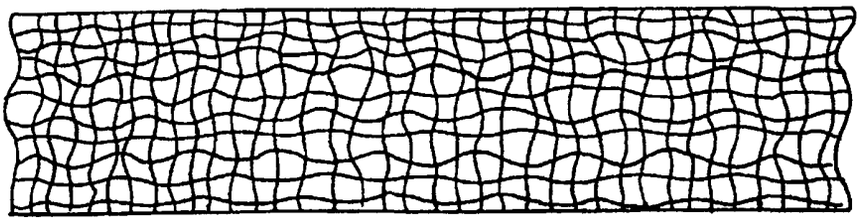


Fig.5B.

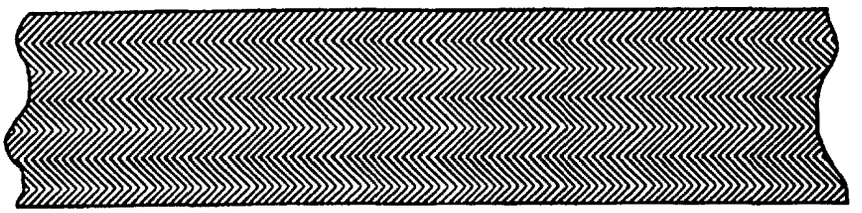


Fig.5C.

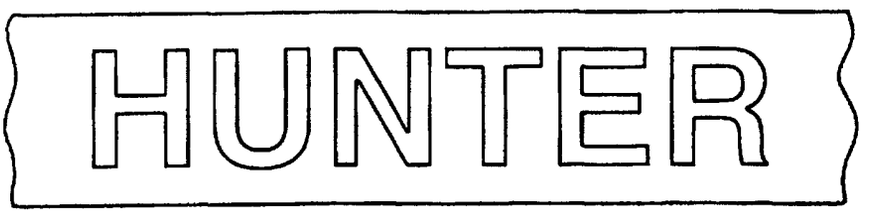


Fig.5D.

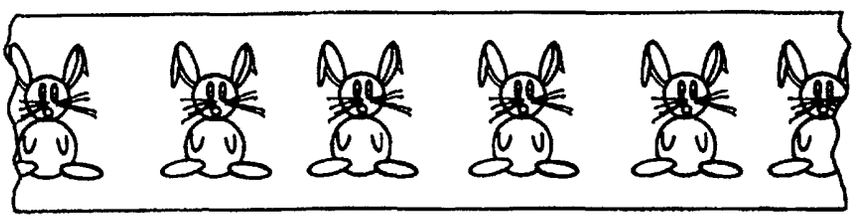


Fig.5E.

