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

(11) EP 0 964 111 A1

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
15.12.1999 Bulletin 1999/50

(51) Int Cl.[6]: **E04C 2/296**, E06B 9/17

(21) Application number: **99102500.8**

(22) Date of filing: **10.02.1999**

(84) Designated Contracting States:
AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU MC NL PT SE
Designated Extension States:
AL LT LV MK RO SI

(30) Priority: **10.06.1998 IT VE980026**

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(54) Method for constructing panels for roller shutter boxes, a plant for implementing the method, and a panel obtained by the method

(57) A method for constructing roll shutter box panels, comprising the following steps:

- forming a metal strip to obtain a continuous shaped strip (6).
- injecting a polyurethane foam into the shaped strip (8),
- applying a deformable film (12) onto said foam,
- deforming said foam in accordance with a defined contour (14),
- polymerizing the foam until it hardens (20), and
- cutting the shaped strip to obtain a panel of desired dimensions (22).

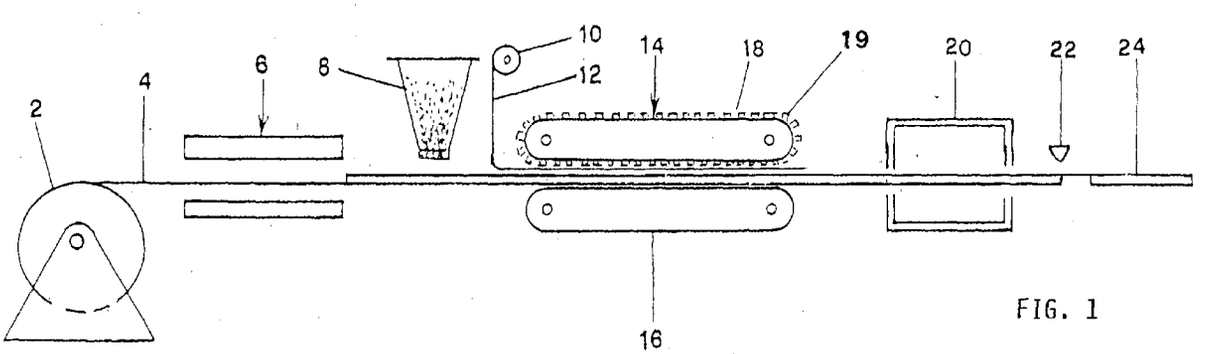

FIG. 1

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Description

[0001] This invention relates to a method for constructing panels for roll shutter boxed, a plant for implementing the method, and a panel obtained by the method.

[0002] Boxes for roll shutters of slatted type are well known. They were formerly of wooden construction but are now constructed of bent and seam-jointed sheet metal or extruded aluminium, or are in the form of panels of extruded plastics construction coupled together.

[0003] It also been proposed to construct such boxes from panels each constructed from two metal sheets between which a layer of expanded material is interposed, said panels being joined together along their contacting edges.

[0004] An object of the invention is to provide a panel for roll shutter boxes which has the same characteristics as internally lined metal panels but which can be constructed more easily and at lower cost.

[0005] A further object of the invention is to provide a panel having good dimensional stability and resistance to deformation, compared with plastics panels.

[0006] These and further characteristics which will be apparent from the ensuing description are attained according to the invention by a method for constructing panels for roll shutter boxes as claimed in claim 1.

[0007] A plant for implementing the method is claimed in claim 5.

[0008] A panel obtained by the method is claimed in claim 8.

[0009] A preferred embodiment of the invention is described in greater detail hereinafter with reference to the accompanying drawing, on which:

Figure 1 is a schematic view of a plant for implementing the method of the invention;
Figure 2 shows a "male" first panel obtained by the method, for forming roll shutter boxes;
Figure 3 shows a "female" second panel; and
Figure 4 shows a roll shutter box constructed from the panels.

[0010] As can be seen from the figures, the method for constructing panels according to the invention involves the use of a plant comprising substantially a reel 2 from which a metal strip 4 having a thickness of 0.25-. 0.7 mm and preferably 0.32-0.4 mm is unwound and which is positioned upstream of a forming machine 6, at the exit of which a polyurethane foam injection station 8 is provided.

[0011] Downstream of said station 8 there are provided a reel 10 from which aluminium or plastic film 14 is unwound, and a shaping unit 14. The film thickness is a few hundredths of a mm in the case of aluminium film, or a few tenths of a mm in the case of plastic film.

[0012] Said unit 14 consists of two overlying belt conveyors 16, 18, with the lower conveyor 16 having a flat surface to support and advance the shaped strip and the upper conveyor 18 having its outer surface shaped to conform to the shape to be given to the foam in its unhardened state.

[0013] In particular said shaped surface is obtained by applying shim portions 19.

[0014] At the conveyor exit there is a polymerization tunnel 20, with a cutter 22 provided at its exit.

[0015] According to the method of the invention the metal strip 4 is unwound from the reel 2 and is passed through the forming machine in which it is shaped to the desired form. In particular, the shaped strip obtained has its edges bent to C-shape and slightly diverging outwards.

[0016] Polyurethane foam 21 is then injected into the shaped strip, the film 12 from the reel 10 then being laid on the foam, to rest on the edges 25.

[0017] The shaped strip is then advanced into the shaping unit, which adheres perfectly to the strip, and in which the upper conveyor 18 not only gives the required shape to the foam by means of the shims 19, but also, via the interposed film, closes the longitudinal compartment intended for the expanding foam.

[0018] The shaped strip is then fed to the polymerization tunnel 20 where the foam hardens, after which the shaped strip is cut to obtain the panel 24 of the desired length.

[0019] Figure 4 represents a roll shutter box obtained from the panels illustrated in Figures 2 and 3, in which it can be seen that they are connected together by inserting an appendix 26 of the "male" panel into a seat 29 of the "female" panel, with a seal gasket 30 therebetween.

[0020] From the aforegoing it is apparent that the method of the invention has numerous advantages, and in particular:

- it enables panels to be obtained in a simpler manner,
- the plant cost is lower due to the elimination of the operations required to connect the shaped strips together, as is the finished product cost due to the reduction in the polyurethane quantity,
- it enables roll shutter boxes of lighter weight to be constructed by virtue of the lesser weight of their component shaped strips,
- it has good torsional rigidity due to the presence of the film, if of aluminium,
- the shaped strip can be used for other purposes such as false ceilings or insulating facings, because of the good finish of the product obtained.

Claims

1. A method for constructing roll shutter box panels, comprising the following steps:

- forming a metal strip to obtain a continuous shaped strip,
- injecting a polyurethane foam into the shaped strip,
- applying a deformable film onto said foam,
- deforming said foam in accordance with a defined contour,
- polymerizing the foam until it hardens, and
- cutting the shaped strip to obtain a panel of desired dimensions.

2. A method as claimed in claim 1, characterised by deforming the film during the expansion of the polyurethane foam.

3. A method as claimed in claim 1, characterised by applying a deformable aluminium film.

4. A method as claimed in claim 1, characterised by applying a deformable plastic film.

5. A plant for implementing the method claimed in claims 1 to 4, characterised by comprising:

- a unit (6) for forming a metal strip (4) to obtain a shaped strip with bent edges,
- a unit (8) for injecting polyurethane foam into the shaped strip,
- a unit (10) for unwinding a flexible film (12) onto the cavity of the product,
- a unit (14) for pressing the surface covered by the film,
- a polymerization station (20) for the polyurethane foam,
- a cutting station (22).

6. A plant as claimed in claim 5, characterised in that the pressing unit is formed from two overlying parallel conveyors (16,18) for advancing the shaped strip.

7. A plant as claimed in claim 5, characterised in that that conveyor facing the flexible film is provided with a plurality of shaped pieces (19).

8. A panel obtained by the method claimed in one or more of claims 1 to 4, characterised by being constructed of a metal sheet (4) and a sheet (12) of deformable film, between these latter there being interposed a layer of expanded material (21).

9. A panel as claimed in claim 8, characterised in that the deformable film is of aluminium.

10. A panel as claimed in claim 8, characterised in that the deformable film is of plastics material.

11. A panel as claimed in claim 8, characterised by having C-bent edges.

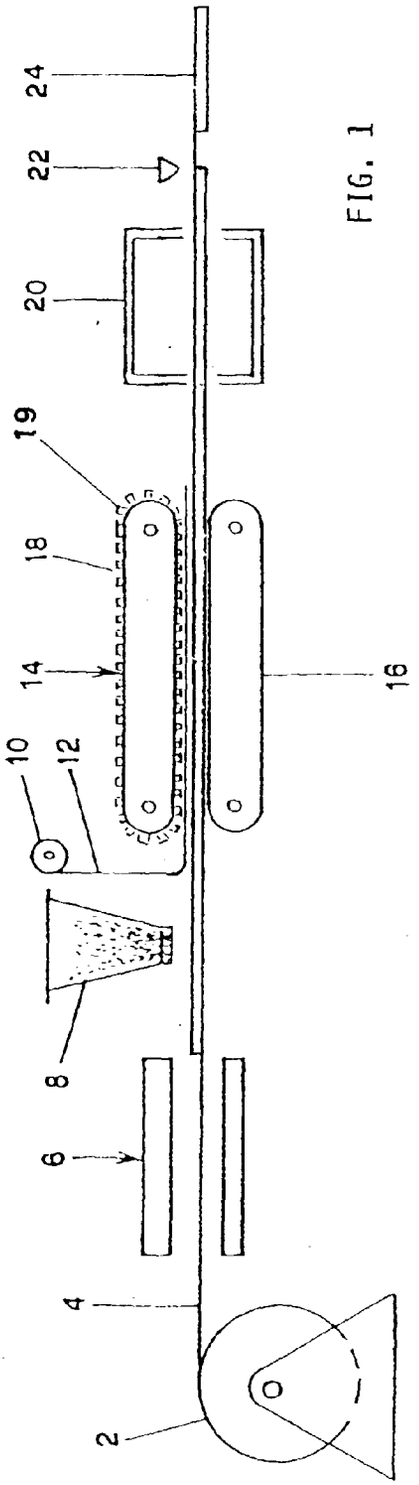


FIG. 1

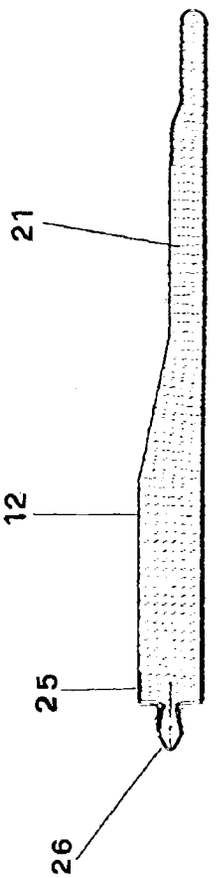


FIG. 2

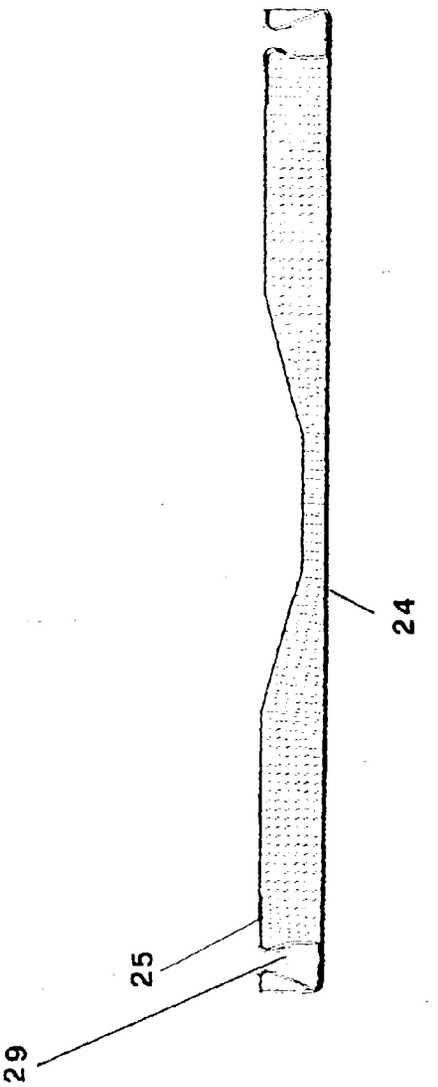
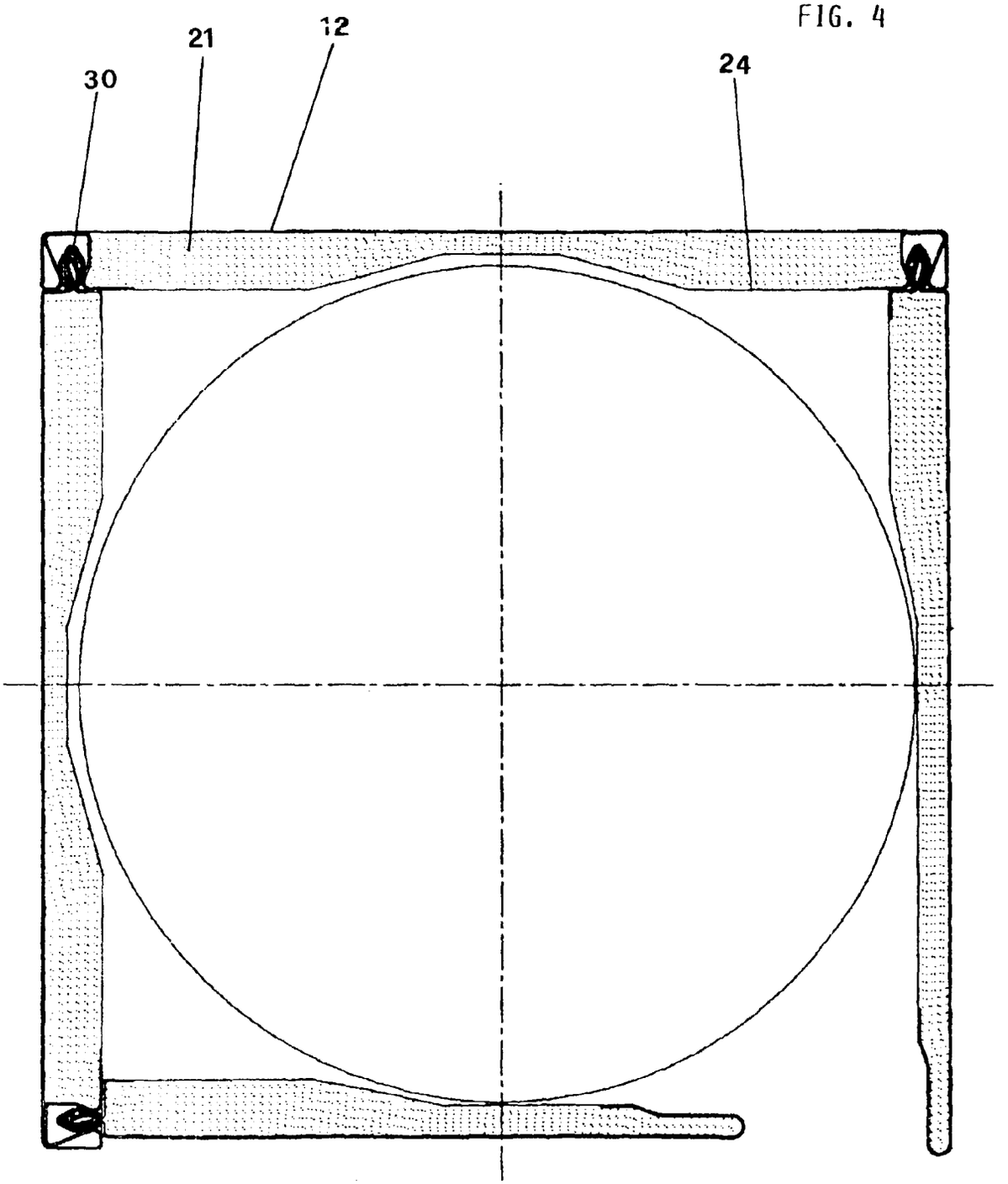


FIG. 3

FIG. 4



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EUROPEAN SEARCH REPORT

Application Number
EP 99 10 2500

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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	27 September 1999	Verdonck, B

CATEGORY OF CITED DOCUMENTS

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