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

(11) EP 0 692 052 B1

(12) **EUROPEAN PATENT SPECIFICATION**

(45) Date of publication and mention of the grant of the patent:
07.06.2000 Bulletin 2000/23

(21) Application number: **94912122.2**

(22) Date of filing: **29.03.1994**

(51) Int. Cl.[7]: **E04C 2/26**, F24F 13/10

(86) International application number:
PCT/SE94/00279

(87) International publication number:
WO 94/23148 (13.10.1994 Gazette 1994/23)

(54) **TORSION RESISTANT DAMPER ELEMENT**

VERDREHSICHERES DÄMPFUNGSELEMENT

ELEMENT AMORTISSEUR RESISTANT A LA TORSION

(84) Designated Contracting States:
AT BE DE DK GB NL SE

(30) Priority: **30.03.1993 SE 9301053**

(43) Date of publication of application:
17.01.1996 Bulletin 1996/03

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EP 0 692 052 B1

Printed by Xerox (UK) Business Services
2.16.7 (HRS)/3.6

Description

TECHNICAL AREA

[0001] The present invention refers to a method for continuous in line production of damper elements, comprising in cross section two substantially in parallel with a certain relative slit width arranged sheets, which slit is bridged at the sheet edges by cantlists, in such a way that the sheets and the cantlists delimit at least one space inside the element, which space is filled with a foamed material. Such damper elements are for example known from DE-A-1914536.

BACKGROUND OF THE INVENTION

[0002] The element in accordance with above is reminiscent of elements that can be part of e.g. folding doors, at which it generally meets the necessary demands regarding rigidity and insulation.

[0003] Adjustable damper blades for use as control device, fire damper, baffle and the like in ventilation constructions can have a length of up to 2 metres. These elements are rotatable between different adjustment positions and exposed to considerable torsion stresses, and do therefore need higher torsion rigidity. If necessary torsion rigidity is not obtained, the damper blade adjustment function will not be satisfactory, which may bring on serious consequences if the blades form part of a fire damper. For this purpose, it has usually been necessary to assemble a damper blade by means of screws, blind rivets, spot welds or other means which have made production of such damper blades relatively work intensive. The demands on close tolerances, e.g. absence of play, do also make production more expensive.

THE TECHNICAL PROBLEM

[0004] The purpose of the present invention is to provide a damper blade, by which high torsion rigidity is obtained without use of expensive screws, blind rivets or spot welds for assembly.

THE SOLUTION

[0005] For this purpose the invention is characterized in that sheet plate is pulled in parallel off two magazine rolls and said sheets are formed in parallel by folding into a top sheet and a bottom sheet, the two folded sheets are joined continuously by means of the elastic sections of the cantlists cooperatively with folded sections at the edges of the sheets to achieve mechanical joining of the element before foaming, the foam is injected in the space between the sheets and the cantlists by means of a nozzle which reaches in between the sheets, the foam is activated for expansion and setting, and the composite structure is cut into suitable lengths by means of a flying chopper.

DESCRIPTION OF THE DRAWINGS

[0006] The invention will be described hereinafter with reference to embodiments shown in the enclosed drawings, wherein

Fig. 1 shows a damper blade according to the invention in a broken plane view,
Fig. 2 is an end view of the damper blade shown in Fig 1, and
Fig. 3 shows said damper blade in an exploded view.

DESCRIPTION OF EMBODIMENT

[0007] The damper blade, shown in the drawings, comprises an external shell consisting of two metal sheets 10 being profiled by folding, which are joined by means of cantlists 11 along both longer sides.

[0008] Quadrangular axle spindles 12 of metal are placed between the sheets 10 at both short ends of the damper blade. For fixing of the axle spindles 12 in the longitudinal direction of the blade, the sheets are provided with grooves 13, which connect to the quadrangular form of the axle spindles. In addition, an U-shaped mountings 14 is pressed onto each short end of the blade, thus tightening the sheets against the axle spindles. The mountings 14 in its turn, are attached to the sheets 10 in a very effective and simple way, by a prick punch on each side, using the axle spindles as a dolly for the prick punches.

[0009] The axle spindles 12 normally extend only about 50 mm into the damper blade from each short end. The torque that may arise between both mounting ends of the axle spindles, are transmitted very effectively and without play to the sheets of the damper blade by said mounting.

[0010] The sheets 10, cantlists 11 and mountings 14 enclose a space filled with a foamed material 16, e. g. a polyurethane foam. This foam material adheres to the insides of the sheets, and contributes actively to make the damper blade torsion resistant.

[0011] The sheets 10 are provided with hook-shaped folded sections 17 at the side edges, which sections are facing the interior of the blade. The cantlists 11 present elastical sections, which cooperate during assembling of the element, with the folded sections 17, producing mechanical joining of the element before foaming of the foam material.

[0012] The elastical sections comprise a centrally situated web section 18, which extends in between the hook-shaped folded sections 17 of the sheets 10, and is coaxial with the central plane of the element. The web section 18 turns into a shoulder section 19 with hooking means 20, which grasp the hook-shaped creased section 17 of the sheets 10.

[0013] The above described attachment of the sheets via the cantlists, provides a sufficient strength for holding the parts together during entry and expanding of the foam. This makes it possible to produce the damper blade from thin sheet metal, e.g. 0,5 mm galvanized sheet metal. In this respect, the blade can be continuously produced in a line, wherein continuous sheets are fed in parallel from two magazine rolls, and formed parallelly into one top sheet and one bottom sheet by means of roll folding. Both folded sheets are thereafter continuously assembled by means of the cantlists 11. Foam is then injected in the space between the sheets and the cantlists via a long nozzle, which reaches between the sheets before they are assembled by the lists. The foam is activated, expands and sets to its final shape by passage trough an oven.

[0014] Now the foam forms a locking for the hooking means of the cantlists, so that these can not slip away from their grip on the hook-shaped folded sections 17 of the sheets 10, even if the composite element is exposed to considerable strains.

[0015] Crosscutting into adequate length is thereafter repeatedly executed in a so called "flying chopper". Finally, the axle spindles are mounted in the intended positions, by inserting into the grooves 13, and the mountings 14 are mounted in the previously described way.

[0016] The invention is not limited to the above described embodiment, instead more variants are conceivable within the scope of following claims. For instance, the sheets 10 can be folded otherwise than shown, wherein the sections 17 do not need to be hook-shaped.

Claims

1. A method for continuous in line production of damper elements, each damper element comprising in cross section two sheets (10) principally arranged in parallel with a certain relative slit width, which slit is bridged at the sheet edges by cantlists (11) having elastic sections (19,20) in such a way that the sheets and the cantlists delimit at least one space inside the element, which space is filled with a foamed material (16), characterized by

   pulling sheet plate in parallel off two magazine rolls and forming said sheets in parallel by folding into a top sheet and a bottom sheet,
   joining the two folded sheets continuously by means of the elastic sections of the cantlists (11) cooperating with folded sections (17) at the edges of the sheets to achieve mechanical joining of the element before foaming of the foam material (16),
   injecting the foam (16) in the space between the sheets and the cantlists by means of a nozzle which reaches in between the sheets,
   activating the foam for expansion and setting, and
   cutting the composite structure into suitable lengths by means of a flying chopper.

2. The method according to claim 1, characterized in that the foam (16) is set during passage through an oven.

3. The method according to claim 1 or 2, characterized in that grooves (13) are formed in the sheets during folding, and that axle spindles (12) are mounted in said grooves (13) between the two sheets (10) after said foaming.

4. The method according to claim 3, characterized in that a U-shaped mounting (14) is pressed onto each short end of the element, thus tightening the sheets against the axle spindles (12).

Patentansprüche

1. Verfahren zur kontinuierlichen Fließfertigung von Dämpfungselementen, wobei jedes Dämpfungselement im Querschnitt zwei dünne Platten (10) aufweist, die im Prinzip parallel zu einander in bestimmter relativer Spaltbreite angeordnet sind, wobei der Spalt an den Plattenkanten durch einen abgekanteten Saum (11) mit elastischen Abschnitten (19, 20) überbrückt ist, derart, dass die dünnen Platten und der Saum zumindest einen Zwischenraum innerhalb des Elements begrenzen, wobei der Zwischenraum mit einem Schaumstoff (16) gefüllt ist,
   gekennzeichnet durch

   Abziehen der dünnen Metallplatte parallel von zwei Magazinrollen und Formen der dünnen Metallplatten parallel durch das Falten zu einer oberen dünnen Platte und einer unteren dünnen Platte,
   Verbinden der zwei gefalteten dünnen Planen fortlaufend mit Hilfe der elastischen Abschnitte des abgekanteten Saumes (11), die mit den gefalteten Abschnitten (17) an den Kanten der dünnen Platten zusammenwirken, um eine mechanische Verbindung des Elements vor dem Schäumen des Schaumstoffes (16) zu erreichen,
   Einspritzen des Schaumes (16) in den Zwischenraum zwischen den dünnen Platten und den Säumen mit Hilfe einer Düse, die zwischen die dünnen Platten reicht, und
   Aktivieren des Schaumes zur Ausdehnung und Formfestigung, sowie Schneiden der Verbundkonstruktion in geeignete Längen durch ein fliegendes Hackmesser.

2. Verfahren nach Anspruch 1, **dadurch gekennzeichnet**, dass der Schaum (16) während des Durchlaufs durch einen Trockenofen formgefestigt wird.

3. Verfahren nach Anspruch 1 oder 2, **dadurch gekennzeichnet**, dass beim Falten Aussparungen (13) in den dünnen Platten ausgebildet werden, und dass nach dem Schäumen Achszapfen (12) in den Aussparungen (13) zwischen den zwei dünnen Planen (10) angebracht werden.

4. Verfahren nach Anspruch 3, **dadurch gekennzeichnet**, dass eine U-förmige Fassung (14) auf jedes kurze Ende des Elements gedrückt wird, womit die dünnen Platten gegen die Achszapfen (12) gespannt sind.

Revendications

1. Procédé de production continue en ligne d'éléments amortisseurs, chaque élément amortisseur comprenant, en section, deux feuilles (10) disposées principalement en parallèle avec une certaine relative largeur de fente, laquelle fente est pontée par les bords des feuilles au moyen d'organes de liaison (11) comportant des parties élastiques (19,20) de façon que les feuilles et les moyens de liaison délimitent au moins un espace à l'intérieur de l'élément, ledit espace étant rempli d'une matière moussée, caractérisé en ce qu'il consiste à :

   - tirer les feuilles plates en parallèle de deux rouleaux de stockage et à former lesdites feuilles en parallèle par pliage en une feuille de dessus et une feuille de fond,
   - relier les deux feuilles pliées de manière continue au moyen des parties élastiques des organes de liaison (11) coopérant avec les parties repliées (17) sur les bords des feuilles pour réaliser une liaison mécanique de l'élément avant de mousser la matière en mousse (16),
   - injecter la mousse (16) dans l'espace entre les feuilles et les moyens de liaison à l'aide d'une buse qui est disposée entre les feuilles,
   - activer la mousse pour une expansion et une prise, et
   - couper la structure composite à des longueurs appropriées au moyen d'un couteau frappeur.

2. Procédé selon la revendication 1, caractérisé en ce que la mousse (16) est durcie pendant un passage dans un four.

3. Procédé selon la revendication 1 ou 2, caractérisé en ce que des rainures (13) sont ménagées dans les feuilles au cours du pliage, et en ce que des broches sont montées dans lesdites rainures entre les deux feuilles après ledit moussage.

4. Procédé selon la revendication 3, caractérisé en ce qu'un cadre en forme de U (14) est pressé sur chaque extrémité coude de l'élément, de manière à serrer les feuilles contre les broches (12).

FIG.1

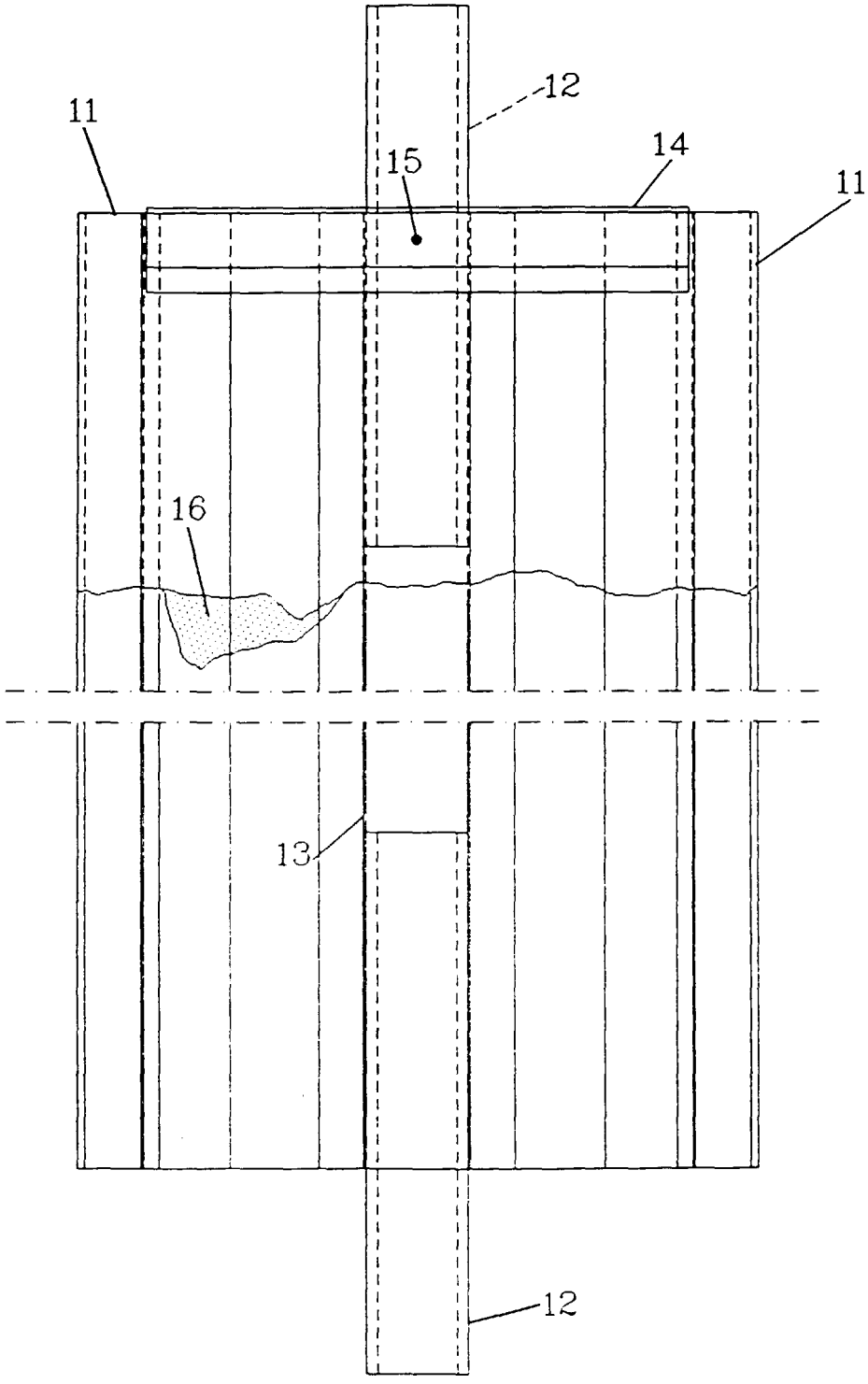


FIG.2

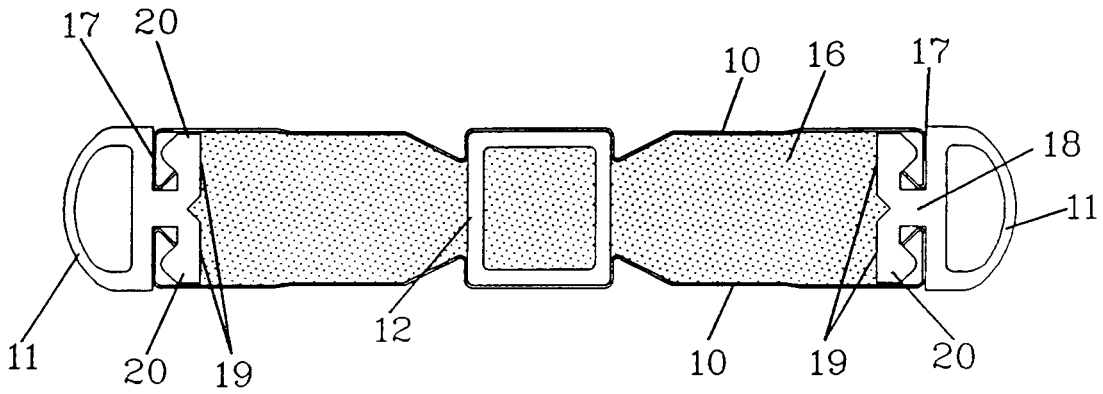
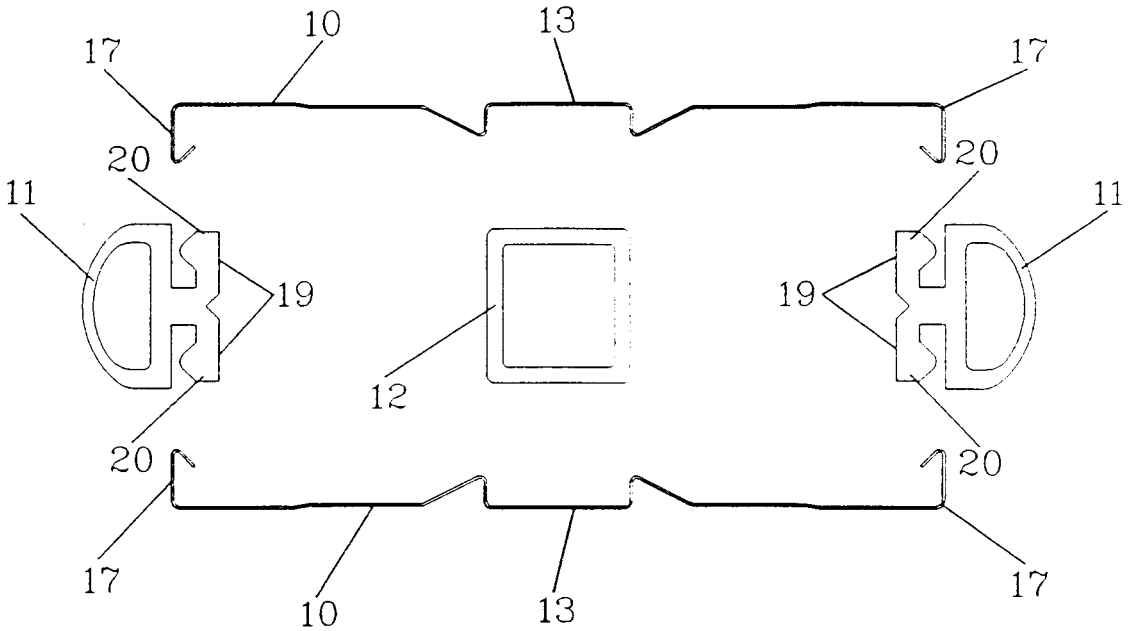

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FIG.3


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