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(54) **METHOD OF PRODUCING AN ANTI-DAZZLE SCREEN FOR AN ELECTRIC LIGHT FITTING AND AN ANTI-DAZZLE SCREEN PRODUCED ACCORDING TO SAID METHOD**

ERSTELLUNGSVERFAHREN EINES BLENDESCHUTZFILMES FÜR EINE ELEKTRISCHE  
BELEUCHTUNGSEINRICHTUNG UND NACH DIESEM VERFAHREN ERSTELLTER  
BLENDESCHUTZSCHIRM

PROCEDE DE PRODUCTION D'UN ECRAN ANTIEBLOUISSANT DESTINE A DES LUMIERES  
ELECTRIQUES ET ECRAN ANTIEBLOUISSANT PRODUIT SELON CE PROCEDE

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(56) References cited:  
**EP-A- 0 435 394** **US-A- 4 888 668**  
**US-A- 5 264 999**

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## Description

**[0001]** The present invention relates to a method of producing an anti-dazzle screen, a reflector or the like for an electric light fitting, which method is described in detail in the preamble of claim 1. Also, the invention relates to an anti-dazzle screen or the like for an electric light fitting, produced according to the method according to claim 1, which anti-dazzle screen or the like is described in detail in the first device claim.

**[0002]** Light fittings, particularly long fluorescent tube fittings, are often provided with an anti-dazzle screen and/or a reflector with bent long sides and transverse ribs, which extend between these sides. The anti-dazzle screen and the reflector respectively usually are made of metal, which has been provided with a reflecting surface layer.

**[0003]** One problem with the known ribs, which in cross-section are wedge-shaped, the point being turned away from the source of light, is that it is difficult to shape the tip or the wedge point in an appropriate way, since it must be as thin as possible in cross-section, so that it will not take up too much space in the light opening of the fitting.

**[0004]** Up to now the wedge point has been obtained through bending around a tool, which includes a sharp tooth having a linear edge. In this connection a certain, not insignificant bending radius always arises, because said tooth close to the bending edge actually, i.a. for strength reasons, must be designed with a certain, not insignificant minimum thickness in cross-section. Consequently, the distance between the rib walls in the edge point will be roughly four times as large as the material thickness, which is unsatisfactory from i.a. a lighting efficiency point of view. Also, it is not possible, without certain inconveniences, afterwards to flatten the rib point, since the reflection properties might become inferior and increased tool and production costs and an extended production time might result respectively.

**[0005]** EP-B-0 435 394 relates to a light fitting with transverse ribs, the point of which has been obtained by bending a metal sheet around two central lines at a mutual distance, until the free edge areas of the sheet in cross-section bear on each other and in this way form a point (Fig. 4). It is true, that in this way the above described inconveniences, which are connected to a bend within the area of the rib point, have been avoided, but new problems, inconveniences and risks have arisen. First of all a sheet blank, bent in this way, has an inherent elasticity, which tends to remove the free ends of the rib legs from each other. Consequently, means are required, which constantly press said free ends against each other. It is true, that such means are available, designed as recesses in laterally positioned reflectors, in which recesses the rib ends are introduced and fastened, but if any play in such recesses and/or manufacturing variations and deformations in the ribs arise, an opening between the free ends of the rib legs results

and the advantages of this production method are wiped out, completely or partially, which affects the reflection properties and the efficiency of the fitting, and at the same time the appearance is negatively changed. Another inconvenience is that such rib points easily can be subjected to permanent damages, e.g. deformations due to blows and shocks. The bending of the base of the ribs, which so far has been a relatively uncritical and uncomplicated operation, now is more critical and decisive. Even if the rib legs are mutually displaced to a very small extent, e.g. in a plane-parallel direction, a rib point cannot be obtained with rib legs ending within the same area but with mutually displaced leg ends, that end which protrudes more being particularly sensitive to e.g. cross-directed strains. There is also a risk that an oval space between the rib leg ends is obtained, particularly in the middle of a rib despite the fact, that said ends bear on each other at the rib ends, which fully or partially can be caused by said inherent elasticity.

**[0006]** The object of the present invention is to counteract and eliminate as far as possible the above-mentioned inconveniences and risks. Another object of the invention is to develop the state of the art in this field in various respects, primarily to develop a product of superior quality with small use of machines and at favorable prices.

**[0007]** Additional characterizing features and advantages of the invention are set forth in the following description, reference being made to the enclosed drawings, which show a few non-limiting embodiments of the invention. The drawings show in detail :

Fig. 1 a perspective view from below of an electric fluorescent tube fitting with i.a. lateral reflectors and ribs, which connect the reflectors to each other ;  
 Fig. 2 a planar view of a completely punched blank for a rib according to the invention;  
 Fig. 3 an end view of the blank according to Fig. 2;  
 Fig. 4 the rib blank according to Figs. 2 and 3 in a planar view after the bending of lateral tongues and a material weakening;  
 Fig. 5 the blank according to Fig. 4 in an end view;  
 Figs. 6 and 7 views corresponding to Figs. 4 and 5 of the blank in an intermediate production phase subsequent to an additional joining of the blank parts to a finished rib;  
 Figs. 8 and 9 views corresponding to Figs. 6 and 7 of the finished rib;  
 Fig. 10 a perspective view from above and from one end of the rib according to Figs. 8 and 9 ; and  
 Figs. 11 and 12 views corresponding to Fig. 10 of two differently designed ribs according to the invention.

**[0008]** In Fig. 1 an electric light fitting 1 is shown, particularly a fluorescent tube fitting, in its entirety. A combination 3 of an anti-dazzle screen and a reflector is inserted in its light opening 2. In the now shown embodi-

ment there are reflectors 4 located at the top, reflectors 5 laterally located and transverse ribs 6, which connect said reflectors to each other and ends 7 of which are inserted and fastened in openings 8 in reflectors 5.

[0009] In Figs. 2-10 the production of a transverse rib 6 according to the invention is shown, the rib being made of metal and/or a plastic material. The rib is provided, in a way known per se, with fastening means 9, 10 and 11 in both ends 7, designed to fasten the rib in the laterally located reflectors 5. Said ends suitably are inclined in order to connect to the shape and position of reflectors 5.

[0010] In Fig. 2 a plane, completely punched blank for a transverse rib 6 according to the invention is shown. The blank is symmetrically designed with a longitudinal central line 12, a flank line 13 located at a distance from the central line 12 on each side of the same as well as e.g. mainly triangular end fields 14, which are defined by flank lines 13, and tongues 15 for reflection and/or fastening purposes.

[0011] In one production phase according to Figs. 4 and 5 tongues 15 have been bent at an e.g. right angle in one direction away from the plane of the blank and flanks 16, positioned between lines 12 and 13 have been slightly bent in the same direction. At the same time or before then, possibly already in connection with the punching according to Figs. 2 and 3 or after said punching central line 12 has been formed or reinforced in order to obtain a material weakening 17, which in a preferred embodiment is wedge-shaped with an acute angle of  $15^\circ - 90^\circ$ , preferably roughly  $30^\circ$  between flanks 21 of the material weakening. The material weakening is obtained by stamping, cutting or the like and is located on that side of the rib, which will constitute outer side 18 of rib point 19. The depth of the material weakening will suitably be  $1/4 - 3/4$ , preferably  $2/3$  of the thickness of the blank.

[0012] Flank lines 13 can also be designed as material weakenings or only be imaginary in Fig. 2 to only emerge in connection with the above-described central bending according to Figs. 4 and 5, namely as the lateral border line of the bending. In case central line 12 has not yet been designed as a material weakening according to Fig. 2, line 12 in Fig. 2 must be seen only as an imaginary line for a subsequent material weakening.

[0013] In one production phase according to Figs. 6 and 7 the blank sides have been swung roughly half-way on their way to the end position, and this shows the design of a bridge 20 between flanks 16 within the area of rib point 19, which bridge at least partially or mainly is preserved also during or in connection with the continued swinging towards the end position according to Figs. 8-10. As is shown, the angle between flanks 21 of the material weakening successively increases to be about  $180^\circ$  in the position shown in Figs. 8-10. In this way a straight and relatively insensitive point end is obtained.

[0014] In Figs. 11 and 12 two alternative rib designs

are shown, in which however the rib point is obtained and the production phases for the rib ensue according to the above-described and in the drawings shown manufacturing steps.

[0015] The present invention is not limited to the embodiments described above and shown in the drawings, but it can be modified and supplemented in arbitrary ways within the scope of the following claims.

## Claims

1. A method of producing an anti-dazzle screen, a reflector or the like (3), for an electric light fitting (1), particularly a long fluorescent tube fitting, including lateral reflectors (5) and ribs (6), which are connected to each other by means of the reflectors and which are wedge-shaped in cross-section, the wedge point (19) being turned away from the source of light of the fitting, and which are fastened with their ends (7) in recesses (8) in said lateral reflectors (5), and which are produced by bending plane blanks made of metal and/or a plastic material, **characterized in that** a rib blank (6) prior to, during or subsequent to a punching and/or bending operation within the area of the rib point (19) to be made and on the exterior side (18) of the rib to be made is provided with a through material weakening (17), preferably by stamping, subsequent to which the blank sides (14,16) on each side of the weakening (17) are brought towards each other with said weakening as a swinging or folding center, until the blank sides (14,16) bear on each other within the area for the rib point (19), obtained in this way, an intact bridge (20) between the blank sides being obtained thereby.
2. A method according to claim 1, **characterized in that** the material weakening (17) is wedge-shaped in cross-section with an acute angle of  $15^\circ - 90^\circ$ , preferably roughly  $30^\circ$ , between the flanks (21) of the material weakening.
3. A method according to claims 1 or 2, **characterized in that** the material weakening has a depth, which is  $1/4 - 3/4$ , preferably  $2/3$ , of the thickness of the blank.
4. A method according to any of claims 1-3, **characterized in that** the angle between the flanks (21) of the material weakening (17) during the folding of the rib blank (6) will increase from a substantial acute angle to an obtuse angle, preferably roughly  $180^\circ$ , to obtain a rib point end, which is substantially straight in cross-section and consequently relatively insensitive to various strains.
5. An anti-dazzle screen, a reflector or the like (3) for

an electric light fitting (1), particularly a long fluorescent tube fitting, including lateral reflectors (5) and ribs (6), which connect the reflectors to each other and which are wedge-shaped in cross-section with the wedge point (19) turned away from the source of light of the fitting and which are fastened with their ends (7) in recesses (8) in said lateral reflectors (5) and which ribs are bent from plane blanks made of metal and/or a plastic material according to the method of claim 1, **characterized in that** the rib (6) within the area for the rib point (19) and on the exterior side (18) of the rib is provided with a through material weakening (17), preferably made by stamping, the blank sides (14,16) on each side of the weakening (17) being brought towards each other with said weakening as a swinging or folding centrum, to bear on each other within the area of the rib point (19), obtained in this way, with an intact bridge (20) between the blank sides obtained thereby.

6. An anti-dazzle screen, a reflector or the like (3) according to claim 5, **characterized in that** the rib (6) has inwardly bent flanks (16), designed to improve the contact between the flanks and further reduce the cross-sectional area of the rib and particularly the rib point (19) and to improve the lighting efficiency.

#### Patentansprüche

1. Verfahren zur Herstellung eines Blendschutzschirms, eines Reflektors oder Ähnlichem (3), für eine Lampe (U, besonders eine lange Leuchtstoffröhre, einschließlich seitlicher Reflektoren (5) und Rippen (6), die mittels der Reflektoren miteinander verbunden und keilförmig im Querschnitt sind, wobei der Keilpunkt (19) von der Lichtquelle weggedreht ist, und die mit ihren Enden (7) in Vertiefungen (8) in besagten seitlichen Reflektoren (5) befestigt sind, und die hergestellt werden durch Biegen ebener Rohlinge aus Metall und/oder einem Kunststoff, **gekennzeichnet dadurch dass** ein Rippenrohling (6) vor, während oder nach einem Stanzen und/oder Biegen innerhalb des Bereichs des herzustellenden Rippenpunkts (19) und auf der Außenseite (18) der herzustellenden Rippe mit einem Loch (17) ausgestattet ist, vorzugsweise durch Stanzen, wonach die blanken Seiten (14, 16) auf jeder Seite der Schwächung (17) mit besagter Schwächung als Schwing- oder Biegezentrum zueinander gebracht werden, bis die blanken Seiten (14,16) innerhalb des Bereichs für den Rippenpunkt (19) aufeinanderliegen, der auf diese Weise erhalten worden ist, wodurch eine intakte Brücke (20) zwischen den blanken Seiten entsteht.

2. Verfahren nach Anspruch 1, **gekennzeichnet dadurch dass** die Materialschwächung (17) keilförmig im Querschnitt mit einem spitzen Winkel von 15° - 90° ist, vorzugsweise ungefähr 30°, zwischen den Flanken (21) der Materialschwächung.

3. Verfahren nach Anspruch 1 oder 2, **gekennzeichnet dadurch, dass** die Materialschwächung eine Tiefe hat, die 1/4 - 3/4, vorzugsweise 2/3, der Stärke des Rohlings beträgt.

4. Verfahren nach einem beliebigen der Ansprüche 1-3, **gekennzeichnet dadurch, dass** der Winkel zwischen den Flanken (21) der Materialschwächung (17) während der Biegung des Rippenrohlings (6) von einem im wesentlichen spitzen Winkel zu einem stumpfen Winkel wird, vorzugsweise ungefähr 180°, um ein Rippenpunktende zu erhalten, das im wesentlichen gerade im Querschnitt ist und folglich verhältnismäßig unempfindlichen gegen verschiedene Beanspruchungen.

5. Blendschutzschirm, Reflektor oder Ähnliches (3) für eine Lampe (1), besonders eine lange Leuchtstoffröhre, einschließlich seitlicher Reflektoren (5) und Rippen (6), die die Reflektoren miteinander verbinden und keilförmig im Querschnitt sind, wobei der Keilpunkt (19) von der Lichtquelle weggedreht ist, und die mit ihren Enden (7) in Vertiefungen (8) in besagten seitlichen Reflektoren (5) befestigt sind, wobei die Rippen aus ebenen Rohlingen aus Metall und/oder einem Kunststoff gemäß dem Verfahren nach Anspruch 1 gebogen werden, **gekennzeichnet dadurch, dass** die Rippe (6) innerhalb des Bereichs für den Rippenpunkt (19) und auf der Außenseite (18) der Rippe mit einem Loch (17) ausgestattet ist, vorzugsweise durch Stanzen hergestellt, wobei die Rohlingsseiten (14,16) auf jeder Seite der Schwächung (17) mit besagter Schwächung als Schwing- oder Biegezentrum zueinander gebracht werden, um einander innerhalb des Bereichs des so erhaltenen Rippenpunkts (19) zu stützen, wobei eine intakte Brücke (20) zwischen den Rohlingsseiten **dadurch** erhalten wird.

6. Blendschutzschirm, Reflektor oder Ähnliches (3) nach Anspruch 5, **gekennzeichnet dadurch dass** die Rippe (6) nach innen gebogene Flanken (16) aufweist, um den Kontakt zwischen den Flanken zu verbessern und die Querschnittsfläche der Rippe und besonders den Rippenpunkt (19) weiter zu reduzieren, und um den Beleuchtungswirkungsgrad zu verbessern.

#### Revendications

1. Procédé de production d'un écran antireflet, d'un ré-

lecteur ou analogues (3), pour un luminaire électrique (1), en particulier pour un luminaire constitué d'un long tube fluorescent, englobant des réflecteurs latéraux (5) et des nervures (6) qui sont reliées l'une à l'autre à l'aide des réflecteurs et qui possèdent une section transversale cunéiforme, la pointe du coin (19) s'écartant de la source de lumière du luminaire, et qui sont fixées avec leurs extrémités (7) dans des évidements (8) pratiqués dans lesdits réflecteurs latéraux (5), et qui sont réalisés en pliant des ébauches planes constituées d'une matière métallique et/ou d'une matière plastique, **caractérisé en ce qu'on** munit, de préférence par estampage, une ébauche de nervure (6), avant, pendant ou après une opération de perforation et/ou de pliage, dans la zone de la pointe (19) de la nervure à réaliser et sur le côté externe (18) de la nervure à réaliser, d'un affaiblissement de matière (17) s'étendant de bout en bout, faisant en sorte que les côtés (14, 16) de l'ébauche de part et d'autre de l'affaiblissement (17) sont amenés l'un vers l'autre, ledit affaiblissement faisant office de centre de pivotement ou de pliage, jusqu'à ce que les côtés (14, 16) de l'ébauche viennent s'appuyer l'un contre l'autre dans la zone destinée à former la pointe (19) de la nervure, ainsi obtenue, pour ainsi obtenir un pont intact (20) entre les côtés de l'ébauche.

2. Procédé selon la revendication 1, **caractérisé en ce que** l'affaiblissement de matière (17) présente une section transversale cunéiforme en formant un angle aigu de 15° à 90°, de préférence un angle de grosso modo 30°, entre les flancs (21) de l'affaiblissement de matière.

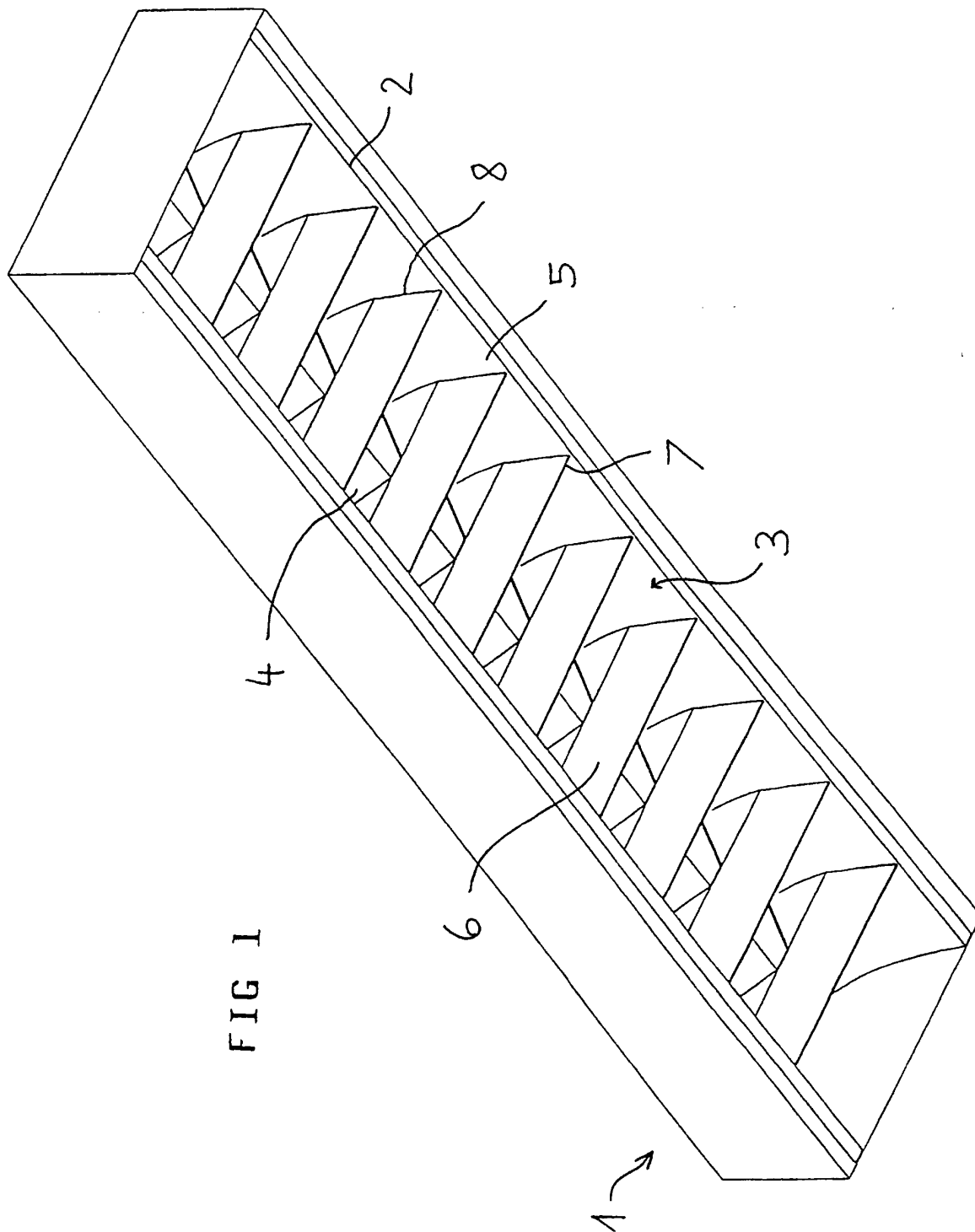
3. Procédé selon la revendication 1 ou 2, **caractérisé en ce que** l'affaiblissement de matière possède une profondeur qui représente une valeur de 1/4 à 3/4, de préférence 2/3 de l'épaisseur de l'ébauche.

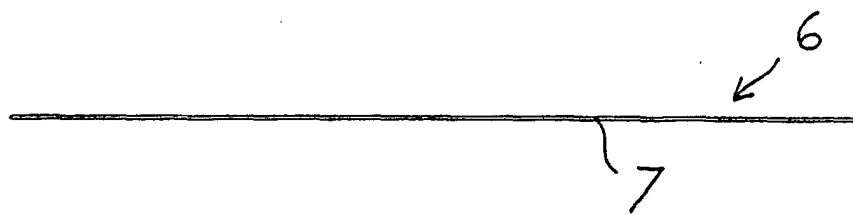
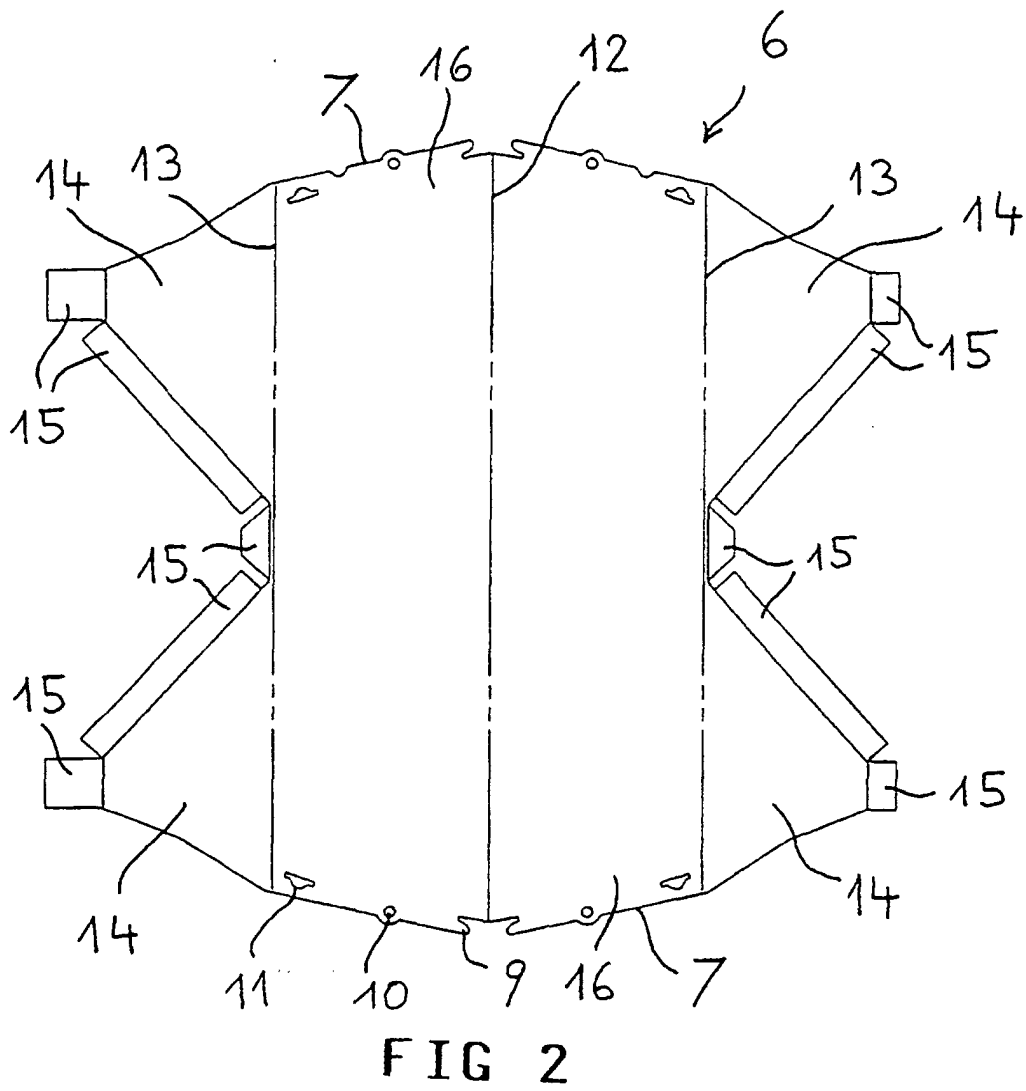
4. Procédé selon l'une quelconque des revendications 1 à 3, **caractérisé en ce que** l'angle formé entre les flancs (21) de l'affaiblissement de matière (17) au cours du pliage de l'ébauche de nervure (6) augmente en passant d'un angle essentiellement aigu à un angle obtus, de préférence un angle de grosso modo 180°, pour obtenir une extrémité de pointe de nervure qui est essentiellement rectiligne en section transversale et par conséquent relativement insensible à diverses contraintes.

5. Écran antireflet, réflecteur ou analogues (3), pour un luminaire électrique (1), en particulier pour un luminaire constitué d'un long tube fluorescent, englobant des réflecteurs latéraux (5) et des nervures (6) qui relient les réflecteurs l'un à l'autre et qui possèdent une section transversale cunéiforme, la pointe du coin (19) s'éloignant de la source de lu-

mière du luminaire, et qui sont fixées avec leurs extrémités (7) dans des évidements (8) pratiqués dans lesdits réflecteurs latéraux (5), lesdites nervures étant réalisées en pliant des ébauches planes constituées d'une matière métallique et/ou d'une matière plastique conformément au procédé selon la revendication 1, **caractérisé en ce que** la nervure (6), dans la zone destinée à la pointe (19) de la nervure et sur le côté externe (18) de la nervure, est munie d'un affaiblissement de matière (17) s'étendant de bout en bout, de préférence réalisé par estampage, les côtés (14, 16) de l'ébauche de part et d'autre de l'affaiblissement (17) étant amenés l'un vers l'autre, ledit affaiblissement faisant office de centre de pivotement ou de pliage, jusqu'à ce que les côtés (14, 16) de l'ébauche viennent s'appuyer l'un contre l'autre dans la zone destinée à former la pointe (19) de la nervure, obtenue de cette manière, et pour ainsi obtenir un pont intact (20) entre les côtés de l'ébauche.

6. Écran antireflet, réflecteur ou analogues (3) selon la revendication 5, **caractérisé en ce que** la nervure (6) possède des flancs (16) pliés vers l'intérieur, conçu pour améliorer le contact entre les flancs et pour réduire davantage la zone en section transversale de la nervure et en particulier la pointe (19) de la nervure pour ainsi améliorer le rendement de l'éclairage.





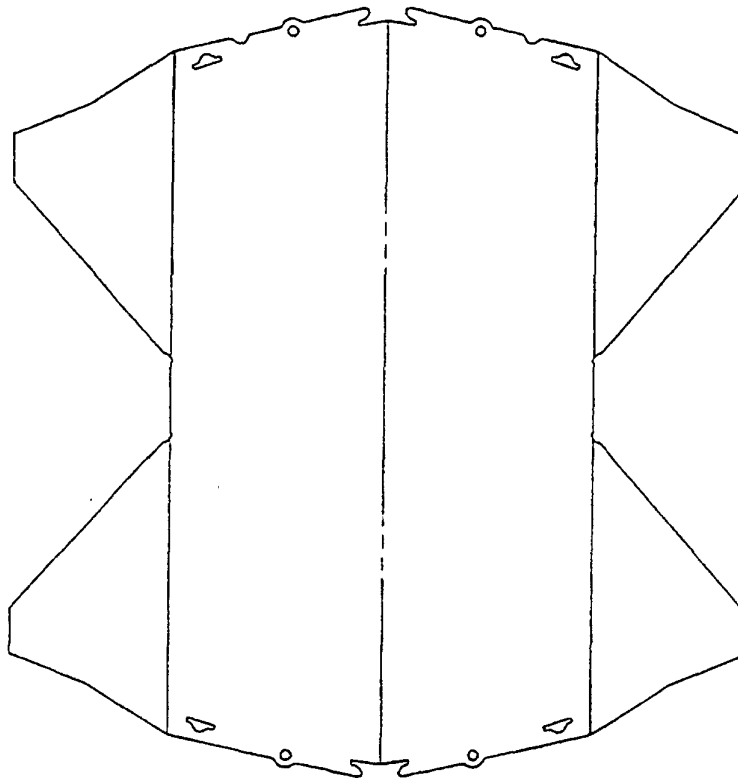


FIG 4

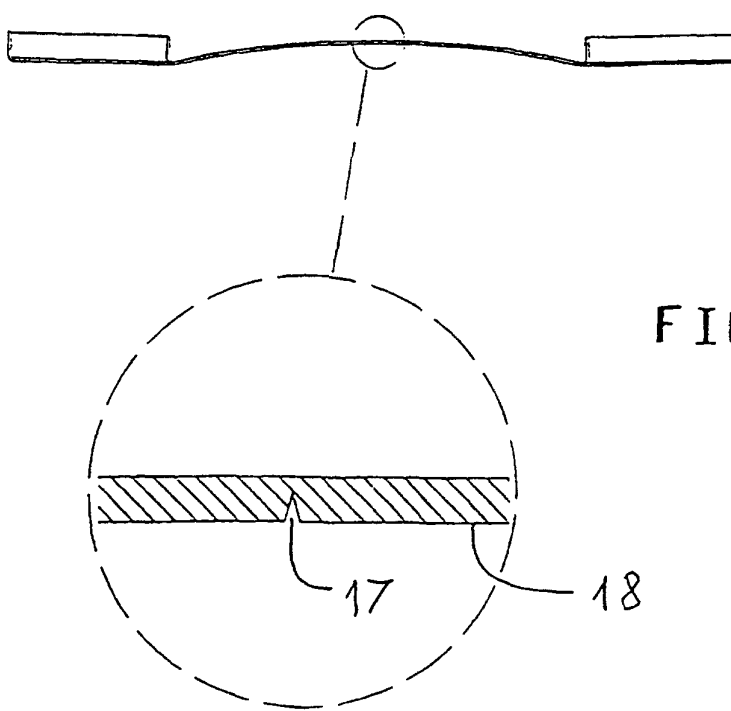


FIG 5

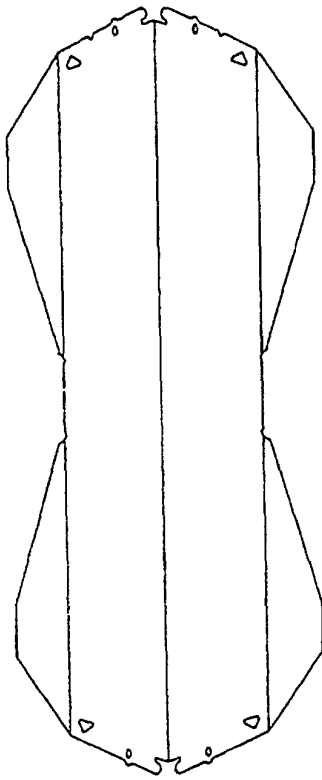


FIG 6



FIG 8

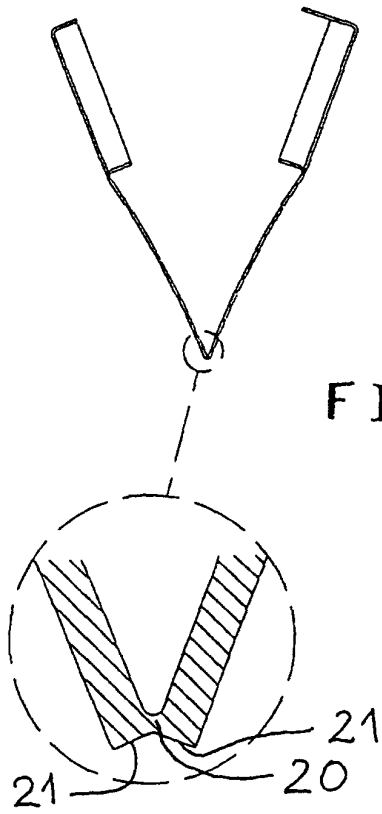


FIG 7

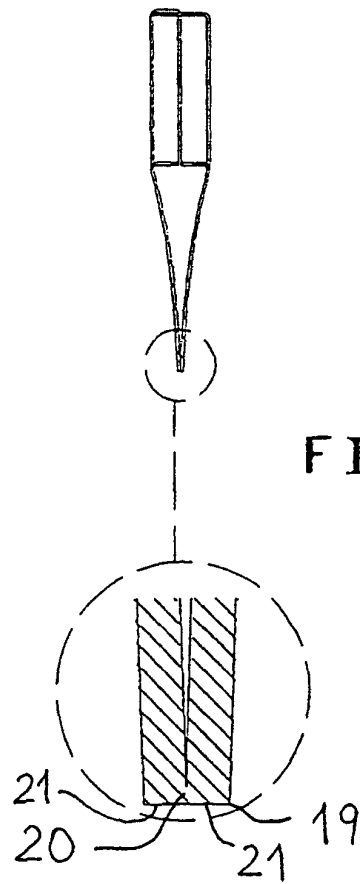


FIG 9

FIG 10

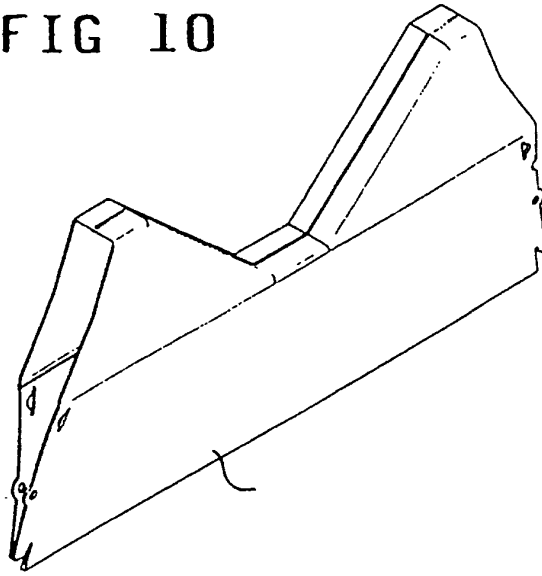


FIG 11

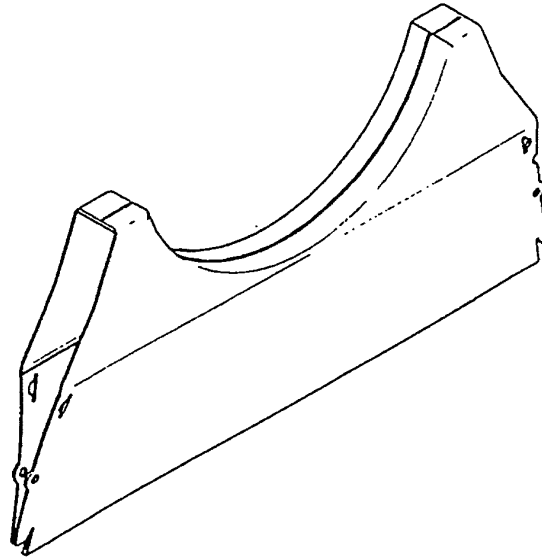


FIG 12

