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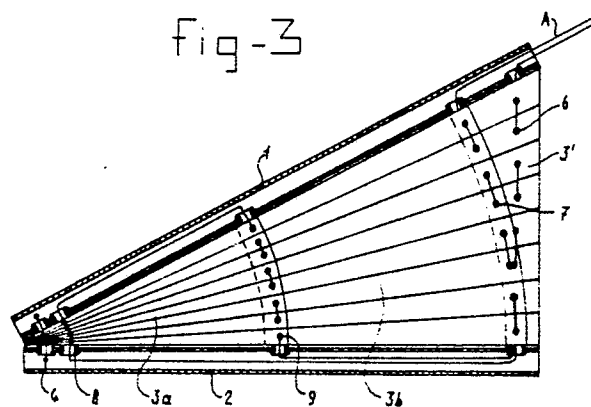
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(54) Folding curtain screen structure for a triangular window.

(57) Folding curtain screen structure for a triangular window consisting of an upper bar (1) installed in a fixed manner along the oblique upper edge and a movable lower bar (2) linked at one end to one end of the upper bar (1) with screening material (3a, 3b, 3') folded in a zigzag form between them, pulling cords being present which run through at least two rows of openings (8,9,7,6) in the screening material and in the lower (2) and upper bar (1) so as to extend from the one end of the upper bar (1) to the outside, wherein the screening material (3a, 3b, 3') is cut so that, in the closed position of the structure, in which the lower bar (2) runs essentially horizontally the free boundary of the screening material runs along an essentially straight vertical line, and the pulling cords are threaded as at least one closed loop (A) through a row of openings (6) essentially parallel to and adjacent to the straight free boundary of the screening material and through at least one row of openings (8,9,7) which, in the closed position of the structure run along a circular arc with the pivot point (4) as centre.



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Folding curtain screen structure for a triangular window

The invention relates to a folding curtain screen structure for a window with an oblique upper edge consisting of an obliquely extending upper bar installed in a fixed manner and a movable lower bar with screening material folded in a zigzag form between them, the uppermost fold being attached to the upper bar and the lowermost fold being attached to the lower bar, pulling cords being present which run through at least two rows of openings in the screening material and in the lower and upper bar so as to extend from the one end of the upper bar to the outside, whereby the screening material is cut so that, in the closed position of the structure, in which the lower bar runs essentially horizontally the free boundary of the screening material runs along an essentially straight vertical line, with one of said rows of openings essentially parallel to and adjacent to the straight free boundary of the screening material.

Such a structure is known for a trapezoid window from the U.S. patent specification 4518025. On operating the pulling cords, the horizontal lower bar firstly moves upwards parallel to itself, and swings then against the upper bar, whereby the screening material is folding up.

Such a structure should also be suitable for a window in the form of a right-angled triangle. The two sides which are perpendicular to each other then run horizontally and vertically, and the other base angle may have various values, for example 45° or less or for example 60°.

Such triangular windows are frequently encountered in the gables in dwellings or other buildings, but also often in sun lounges, and there is always an increasing need for sun shields for them which may have to adjoin conventional rectangular sun shields if the triangular window forms the extension of a rectangular window situated underneath it.

At the known curtain screen structure three separate cords are used at the same manner as at a structure for a rectangular window, as is known from Dutch patent specification 167,220 of the applicant.

At a trapezoid window or a window in the form of a right-angled triangle the separate cords are moving over different distances at closing or opening the structure, so that the cords can not be operated as a unit.

The invention aims to improve the known structure in this respect and to make it more suitable for a triangular window.

According to the invention this is achieved in that the lower bar is pivotably linked at one end to one end of the upper bar and in that the pulling cords are threaded as at least one closed loop

through said row of openings parallel to the vertical boundary of the screening material and through at least one row of openings which, in the closed position of the structure run along the circular arc with the pivot point as centre.

As a result of the pivoting linkage between the two bars, the lower bar can be swivelled downwards to the horizontal base of the triangular window.

Since the pivoting end of the lower bar moves over a smaller distance with respect to the upper bar than the other end, a length compensation has to be provided in the pulling cords.

The pulling cords have in any case to run through the openings near the vertical straight boundary which run in a vertical straight line, this being intended to prevent sagging of the screening material in the pulled-up position of the sun shield.

In the pulled-up position, a part of the screening material is not confined by the lower bar, which is then in close contact with the upper bar.

Just as in the case of known rectangular curtain screen structures, the screening material may also be constructed in the case of a triangular pleating of one or more rectangular sheets which are provided at both ends with openings running in a straight line through which the pulling cords extend. Preferably, a further sheet of screening material is then present with a row of openings at both ends, which sheet loosely overlaps at one end the end of the rectangular sheet facing away from the pivoting point, which further sheet in the closed position of the structure in which the lower bar consequently runs essentially horizontally, forms the straight free boundary.

The invention will be explained in more detail on the basis of a number of exemplary embodiments in which:

Figure 1 is a view of a so-called triangular pleating, in which the screening material consists of one sheet;

Figure 2 is a view of a so-called triangular pleating, in which the screening material consists of a rectangular sheet and of an approximately triangular sheet;

Figure 3 shows a triangular pleating with two rectangular sheets which overlap each other and an approximately triangular sheet with one closed cord loop;

Figure 4 shows the same pleating as Figure 3 with two closed cord loops;

Figure 5 shows a pleating with three rectangular sheets which overlap each other and one approximately triangular sheet with one closed cord loop;

Figure 6 shows the same pleating as Figure 5 with two closed cord loops;

Figure 7 shows the same pleating as Figures 5 and 6 with two closed cord loops and one open cord;

Figure 8 shows a pleating with four rectangular sheets which overlap each other and an approximately triangular sheet with a closed cord loop;

Figures 9 shows the same pleating as Figure 8 with two closed cord loops;

Figure 10 shows the same pleating as Figures 8 and 9 with three closed cord loops;

Figure 11 shows a compensation means for several loops.

The triangular pleating according to the invention consists of a conventional upper bar 1, a conventional lower bar 2 and one or more sheets of screening material, in general sun-shielding material, folded in a zigzag shape.

Furthermore, one or more pulling cords is/are present which emerge to the outside at one end of the upper bar 1 in order to be operated. All this corresponds completely to the structure according to the Dutch Patent 167,220.

The upper bar 1 is at the same time fixed along the upper edge of the window (which is not shown) and the lower bar 2 can be let down or pulled up.

A triangular window which has to be provided with a sun shield has the shape of a right-angled triangle with a horizontal and a vertical boundary and with an oblique upper edge.

The screen in Figure 1 may be used for such a window provided the horizontal width is not too great.

In the manufacture and pleating of screening material there is a limitation to a certain maximum width, in general of 1500 mm. Said width is then cut into standard widths of 410, 450, 480, 510 and 580 mm.

A screen is in practice constructed from a number of sheets of the same width which loosely overlap each other at the ends. In said overlaps openings are present through which the pulling cords extend. This is also known from the Dutch Patent 167,220.

According to the invention, the lower bar 2 is pivotably linked at one end to the corresponding end of the upper bar 1. This pivot may act directly on the upper and lower bar, but it may also be formed by a short piece of cord or the like 4 which extends through openings, lying in one line, in upper bar 1, screening material 3 and lower bar 2 and which contains a stop at the ends.

In the construction in Figure 1 two rows of openings are furthermore present. The one row is indicated by 5 and the second by 6.

The left-hand boundary line of the sheet 3 is straight and the row of openings 5 run along a straight line if the upper bar 1 and the lower bar 2 run parallel.

5 The right-hand boundary line is cut in a manner such that it is straight in the position shown in Figure 1 and runs vertically.

10 The row of openings 6 therefore runs in parallel near the right-hand boundary line. It will be clear that the construction can also be used in mirror image form.

15 The pulling cord A formed into a closed loop runs through the upper bar 1, down through the row of openings 5, through the lower bar 2 to the right and back up and out through the row of openings 6.

The loop A can move completely freely both through both bars and through the screening material.

20 When the loop A is pulled, the lower bar 2 moves in a pivoting manner towards the upper bar 1 and folds the screen 3 together.

25 The screen 3 in Figure 1 can also be constructed in two parts, see Figure 2. The first and largest part is then formed by a rectangular sheet 3a with rows of holes 5 and 7 at both ends, the one row 5 being used for the pivoting cord 4.

30 The second and smallest part is formed by the more or less triangular sheet 3' with the row of holes 6.

In the sheet 3a and the sheet 3' there is a row of holes 7 which overlap each other.

35 The cord loop A is then fed through the rows of holes 6 and 7 and secured on the end stop of the lower bar 2.

The structure in Figure 3 and Figure 4 consists of two rectangular sheets indicated by 3a and 3b and of a more or less triangular part 3'.

40 The left-hand sheet 3a contains on the left a row of holes for the pivoting cord 4, and in addition a row of holes 8 and on the right a row of holes 9 which are overlapped by the left-hand side of the sheet 3b. The sheet 3b contains on the right the row of holes 7 which are again overlapped by the holes 6 of the more or less triangular sheet 3'.

45 In Figure 3 one cord loop A is used which runs down through the row 6, through the lower bar 2 completely to the left up through the row 8, through the upper bar 1 to the right, down through the row 9, through the lower bar 2 to the right, up through the row 7 and out through the upper bar 1.

In Figure 4 two cord loops A and B are used, which is preferable.

55 Loop A goes down through row 6, through bar 2 completely to the left, up through row 8 and through bar 1 to the right and out.

Loop B goes down through row 7, through bar 2 to the left, up through row 9 and out through bar 1. The loops A and B are linked by a cord D which is threaded over a freely rotating pulley or roller 12 in a holder 13 by means of which the screen can be operated (see Figure 11). In this manner, a compensation is produced for the differences in the distance through which the loops A and B move.

In the structure in Figures 5, 6 and 7, three rectangular sheets 3a, 3b and 3c are used and a more or less triangular sheet 3'.

In Figure 5, one cord loop A is used which goes down through the row 6, to the left in the lower bar 2, up through the row 9, through the upper bar 1 to the left, down through the row 8, through the lower bar 2 to the right, up through the row 7 and out through the upper bar 1.

In Figure 6, two cord loops A and B are used.

Cord loop A runs down through row 6, to the left through the lower bar 2, up through row 8 and through upper bar 1 to the right and out.

Cord loop B runs down through row 7, through bar 2 to the left, up through row 9 and through bar 1 to the right and out. Here, too, the compensation means in Figure 11 is used.

In Figure 7 two cord loops A and B and a cord C are used.

The sheet 3a has a further row of holes 10.

Cord loop A runs down through row 6 and through bar 2 to the left, up through row 10 and through bar 1 to the right and out.

Cord loop B runs down through row 7, through bar 2 to the left, up through row 8 and through bar 1 to the right and out.

A cord C which is not closed to form a loop runs through the upper bar 1 to the left, down through the row 9 and through the lower bar 2 to the right where it is secured to a right-hand end stop.

Here, too, the two loops A and B are linked by the cord D, while the cord C is linked to one of the loops A and B.

In this embodiment in Figures 8, 9 and 10, four rectangular sheets 3a, 3b, 3c and 3d are used, as well as an approximately triangular sheet 3'.

In the embodiment in Figure 8, one cord loop A is used which runs down through the row 6, through the bar 2 completely to the left, up through the bar 8, through the bar 1 to the right, down through the row 9, through the bar 2 to the right, up through the row 10, through the bar 1 to the right, down through the row 11, through the bar 2 to the right and up through the row 7.

In the embodiment in Figure 9, loops A and B are used.

Loop A goes down through row 6, through bar 2 completely to the left, up through row 8 and through bar 1 to the right.

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Loop B goes down through row 7, through bar 2 to the left, up through row 10, through bar 1 to the left, down through row 9, through bar 2 to the right, up through row 11 and through bar 1 to the right.

The movement paths of the loops A and B are again compensated for by a device according to Figure 11.

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In the embodiment in Figure 10, three loops are used.

Loop A goes down through row 6, through bar 2 to the left, up through row 8 and through bar 1 to the right.

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Loop B goes down through row 7, through bar 2 to the left, up through row 9 and through bar 1 to the right.

Loop C goes down through row 11, through bar 2 to the left, up through row 10 and through bar 1 to the right.

20

If the sheets 3a-3d have the same width, then the loops B and C move over the same distance.

They can thus be linked together to the one end of the compensation cord D while the loop A is linked to the other end of said cord D.

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The width of the curtain structure can be increased by using more rectangular sheets.

The cord feeding system remains in principle the same.

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The number of cord loops is at the same time dependent on the number of sheets. An additional cord may be used.

With an even number of rows of holes it is always possible to use cord loops exclusively.

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With an odd number of rows of holes an extra cord is necessary in addition.

The cord loops always move both with respect to the two bars and with respect to the sheets of screening material.

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The additional cord is always attached to one end of the lower bar.

The cord loops and possibly the cord are simultaneously operated by one and the same handle and are linked, or not linked, to each other via the compensating means in Figure 11.

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Claims

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1. Folding curtain screen structure for a window with an oblique upper edge consisting of an obliquely extending upper bar installed in a fixed manner and a movable lower bar with screening material folded in a zigzag form between them, the uppermost fold being attached to the upper bar and the lowermost fold being attached to the lower bar, pulling cords being present which run through at least two rows of openings in the screening material and in the lower and upper bar so as to

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extend from the one end of the upper bar to the outside, whereby the screening material is cut so that, in the closed position of the structure, in which the lower bar runs essentially horizontally the free boundary of the screening material runs along an essentially straight vertical line, with one of said rows of openings essentially parallel to and adjacent to the straight free boundary of the screening material characterized in that the lower bar is pivotably linked at one end to one end of the upper bar and in that the pulling cords are threaded as at least one closed loop through said row of openings parallel to the vertical boundary of the screening material and through at least one row of openings which, in the closed position of the structure run along a circular arc with the pivot point as centre.

2. Folding curtain structure according to Claim 1, in which the screening material is constructed of one or more rectangular sheets which are provided at both ends with openings running in a straight line through which the pulling cords extend, characterized in that a further sheet of screening material is present with a row of openings at both ends, which sheet loosely overlaps at one end the end of the rectangular sheet facing away from the pivoting point, which further sheet, in the closed position of the structure in which the lower bar runs essentially horizontally, forms the straight free boundary.

3. Folding curtain structure according to Claim 2, characterized in that with an even number of rows of openings the pulling cords form one or more freely movable closed loops, and in that with an odd number of rows of openings an extra pulling cord is used, an end of which is attached to the lower bar.

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fig-1

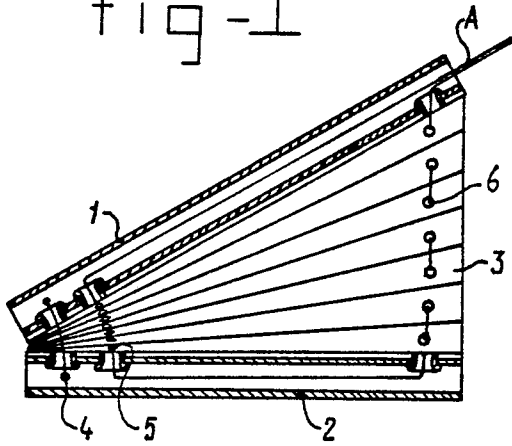


fig-2

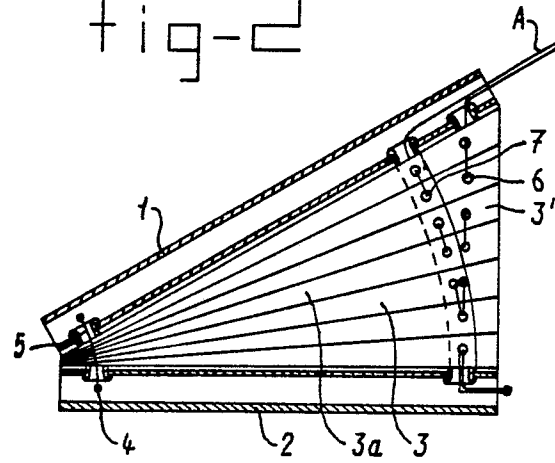


fig-3

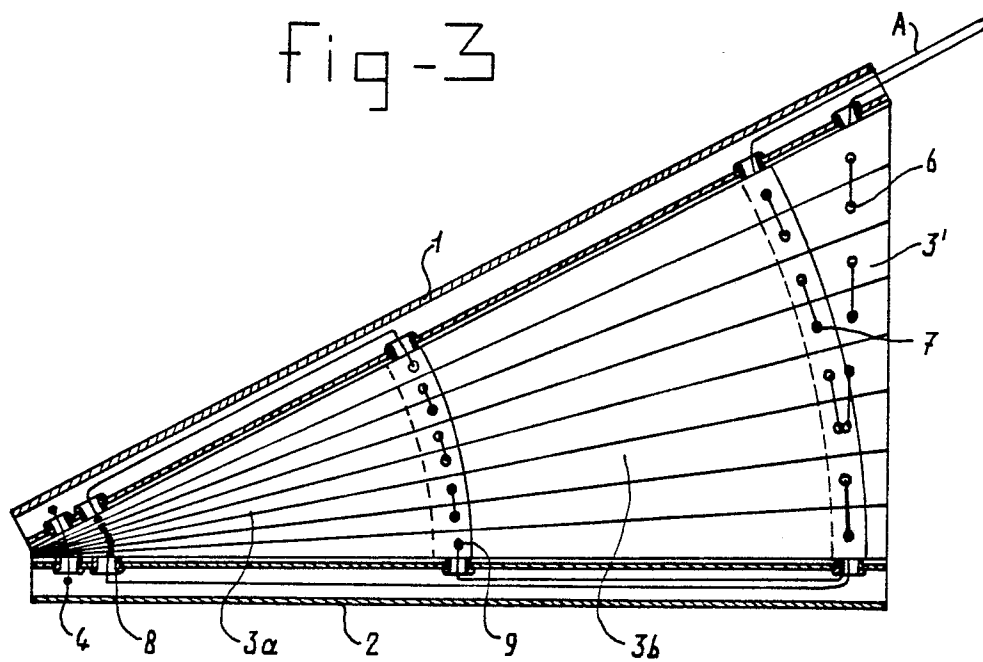




fig-4

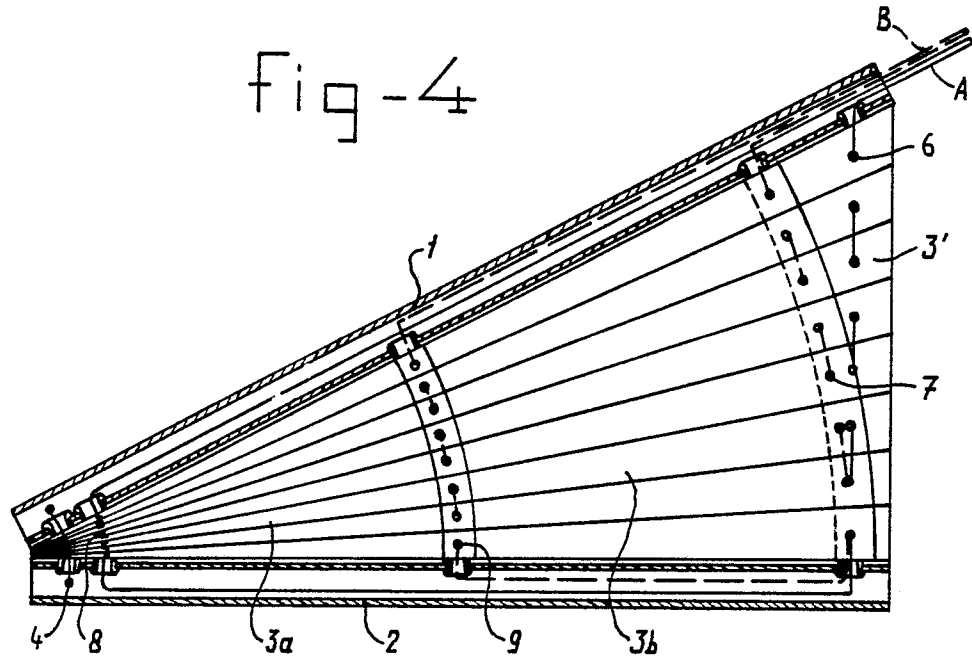
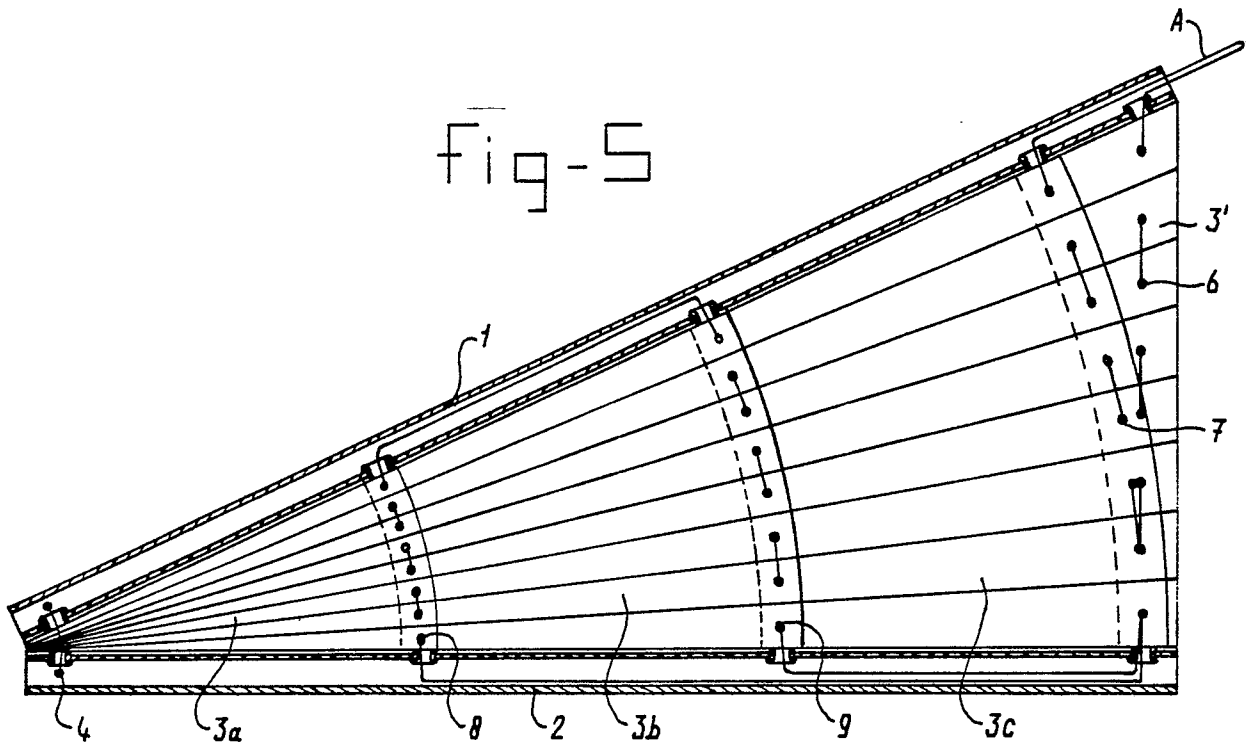


fig-5



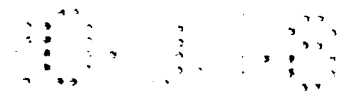


fig-6

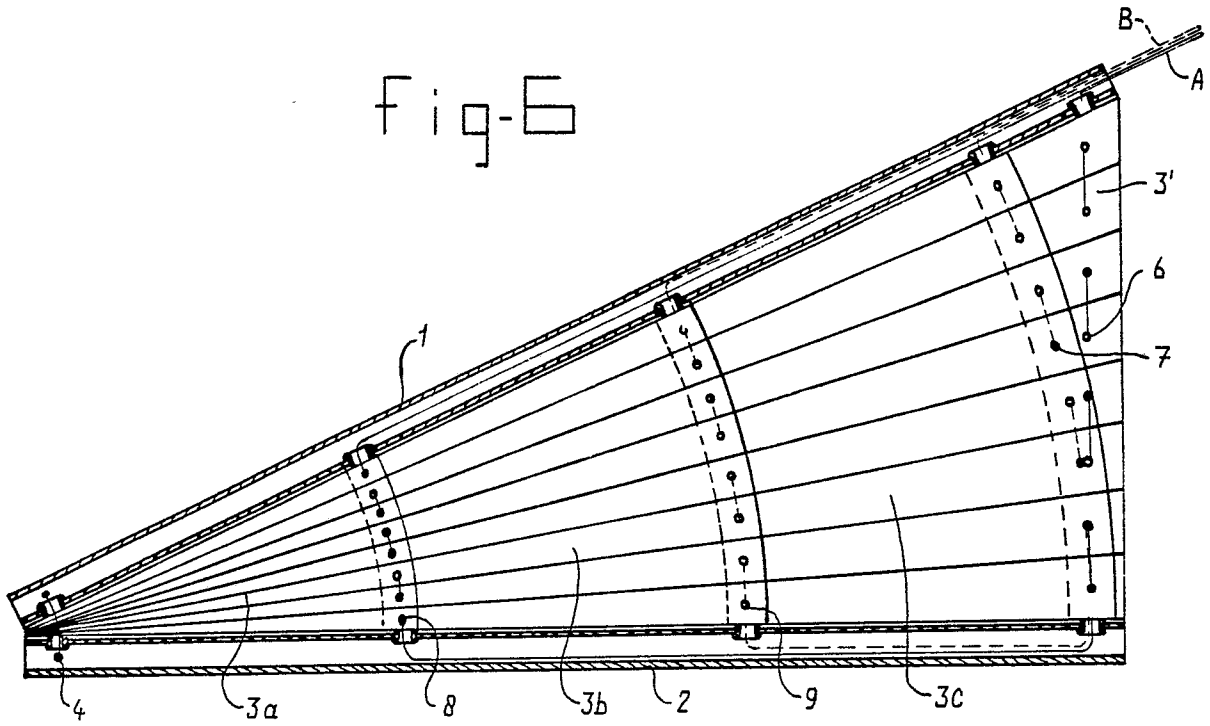
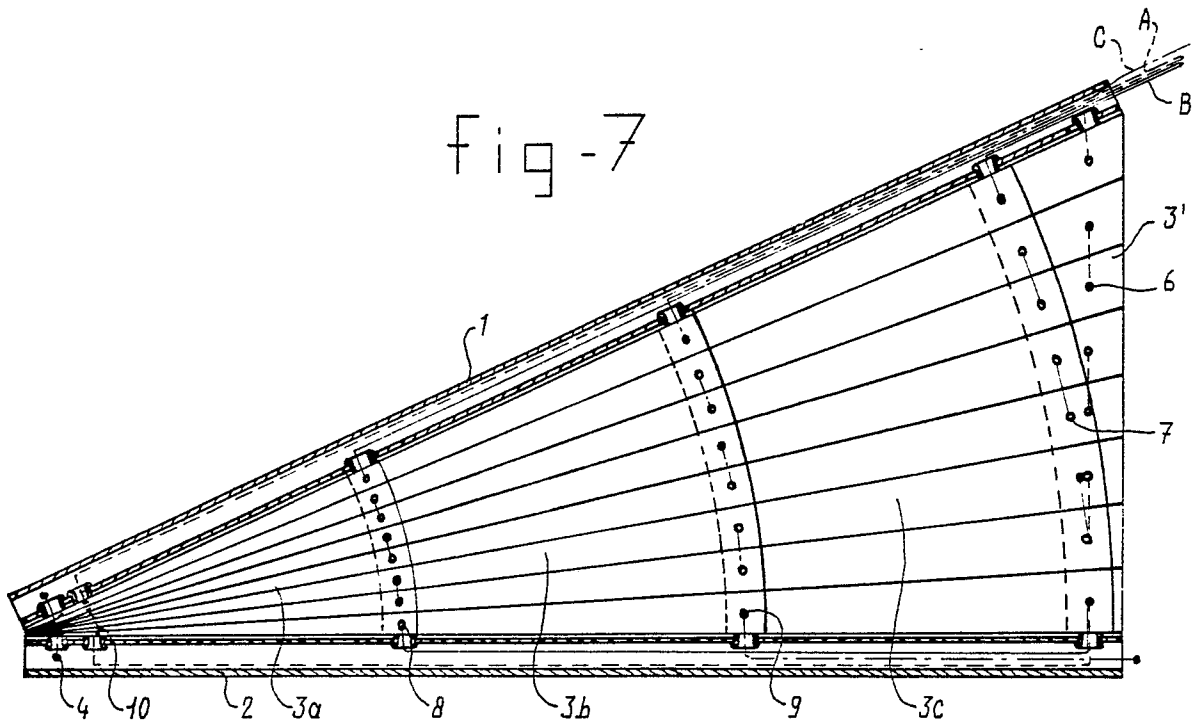


fig-7



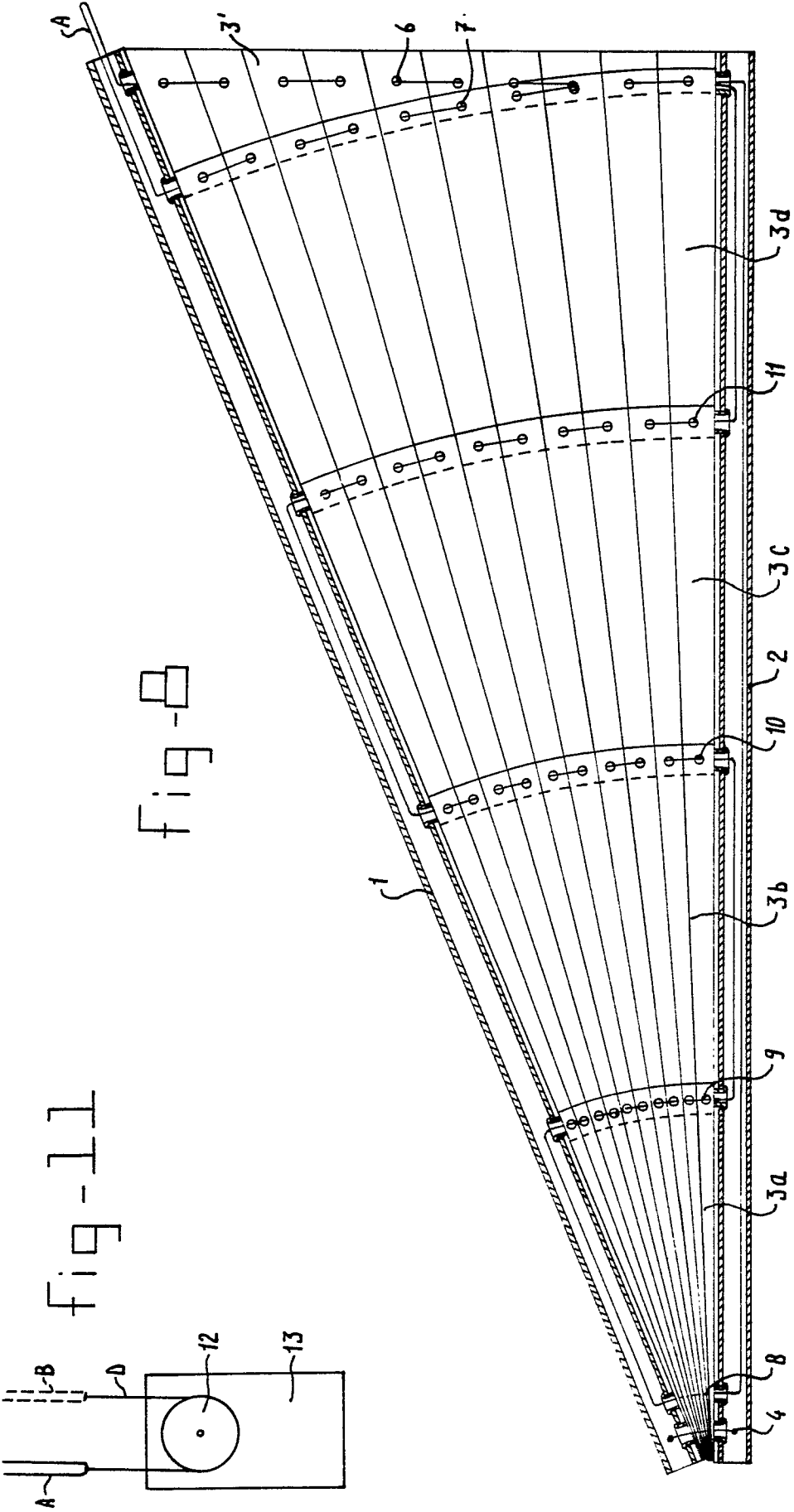


fig-9

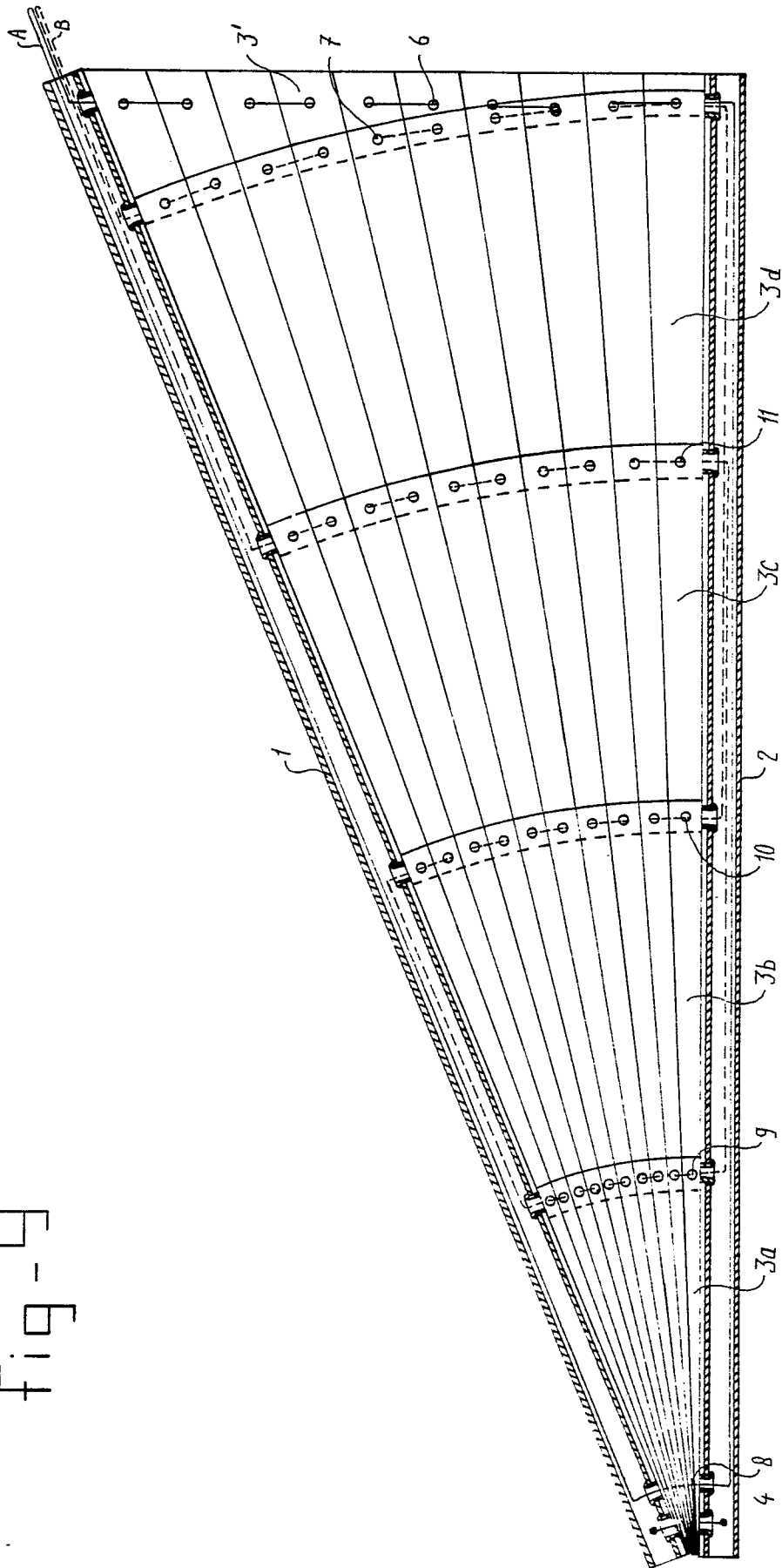
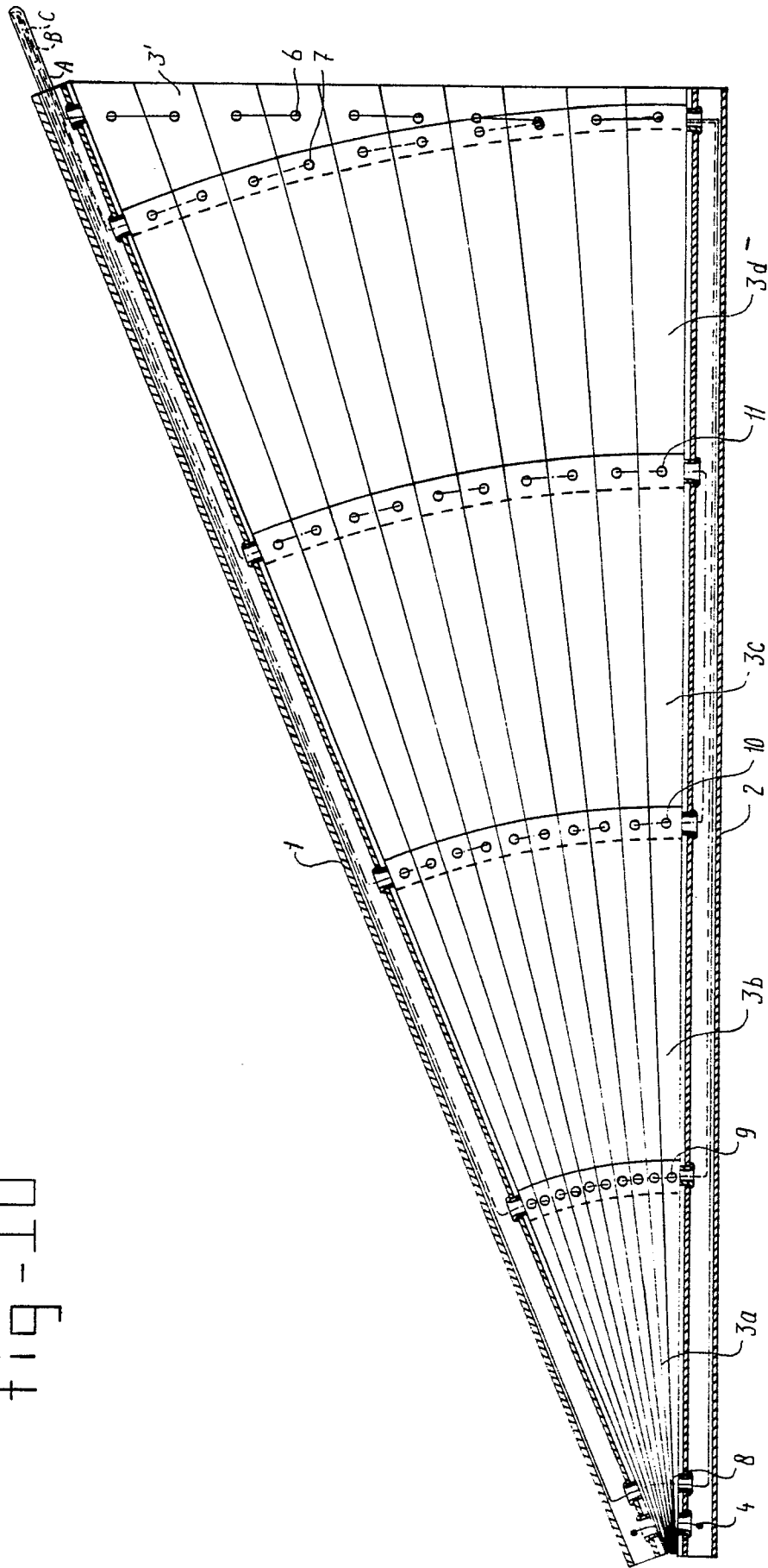


fig-10





DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.4)
D, A	US-A-4 518 025 (JUDKINS) -----		E 06 B 9/262
			TECHNICAL FIELDS SEARCHED (Int. Cl.4)
			E 06 B 9
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 22-06-1987	Examiner VIJVERMAN W.C.
CATEGORY OF CITED DOCUMENTS			
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	