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(54) **Retractable roman shade, profile for said shade and a method for pleating a web of material by means of said profile to form said shade.**

(57) A retractable shade, comprising a first border (2) or the like, at least one web (1) of pleatable material, as fabric, fixed thereto, a second border (3) at a distance to said first border, and at least two cord means (5) extending inbetween said first and second border (2,3), each of said cords (5) being guided through guiding means fixed to said web. To avoid the sewing of the slats for the rigidifying profile in such shade material, the invention provides a shade, wherein the web (1) is provided on predetermined places with a profile element having one or more guiding means and clasp means for receiving a strip of the material-web (1) in a clasping or pinching way. Owing to the clasping profile elements the sewing of the pleatable material is superfluous, and the shade can be manufactured faster and cheaper. It is preferred to clasp the web of material in such a way that a web portion at the one side of the clasping is offset with respect to the web portion at the other side.

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The invention is related to a retractable shade, comprising a first border or the like, at least one web of pleatable material, as fabric, fixed thereto, a second border at a distance to said first border, and at least two cord means extending inbetween said first and second border, each of said cords being guided through guiding means fixed to said web.

In the known embodiment of such a shade according to the type as described above, this shade is sewed at certain places that in the fold formed by said sewing a rigidifying slat can be arranged, in which eyes or orifices are made for guiding said pulling cords. In retracting the shade the slat-like rigidifying profiles will be pulled up by said cords and there will be formed a group of folds or pleats of shade material falling over each other, resulting in a funny aesthetical look of said shade. The disadvantage of such shades is the work involved necessary to sew the slats for the rigidifying profile in said shade material.

The invention has for its object to avoid said disadvantage and it provides a shade, distinguishing in that the web is provided on predetermined places with a profile element having one or more guiding means and clasping means for receiving a strip of the material-web in a clasping or pinching way.

Owing to the clasping profile elements the sewing of the pleatable material is superfluous, and the shade can be manufactured faster and cheaper. The profile element is here also the rigidifying element for the strip, so the guiding means can be arranged in said profile, such as an eye for the cord.

It is preferred to clasp the web of material in such a way that a web portion at the one side of the clasping is offset with respect to the web portion at the other side.

When the shade is provided with two parallel webs behind each other, it is preferred to connect the profiles, necessary for each web, by means of a common rib, wherein the profile elements are arranged mirror-symmetrical. Including the offset clasping of the material-web a trapezoidal shape is obtained.

The invention is further related to a profile suitable for a retractable shade, as described above, wherein the profile can be formed in a single or double embodiment.

It is preferred that the profile is channel-like and provided with a protruding ridge-like element, eventually formed integrally with said profile, wherein a guiding eye or orifice is arranged. Having a longer profile it is also possible to form the lips into a continuous ridge, so being able to manufacture said profile by extrusion. In order to obtain said offset clasping of the material-web and to

carry out the guiding of the pulling cords along the lip-like elements or ribs as friction-less as possible, it is preferred to provide an angularity between the lip-like element or rib and the longitudinal center plane of the channel-like profile, being smaller than 180°.

The clasping means can be a lock-up profile snugly fitting into said channel-like profile, for instance a rod, said rod being a separate profile or being formed as integral portion of the channel-profile.

Finally the invention is also related to a method for folding the web of material for a shade as described above, by means of a channel-like profile without or with a lock-up profile, wherein a strip of the web is brought into the open channel, and whereupon the lock-up profile can be pushed in said channel so clasping the web of material.

The features as described above and other features will be elucidated further in the detailed description of a plurality of embodiments herebelow. In the drawing is:

figure 1 a perspective front view of a window, provided with a retractable shade according to the invention;

figure 2A and 2B a perspective view, similar to that in figure 1, of a part of the shade in a larger scale, in a lowered, and folded or retracted position respectively;

figure 3 a perspective view of a short channel-like profile and lock-up profile according to the invention on a more enlarged scale;

figure 4 a perspective view of a first variant of the channel-like profile having an integral lock-up profile;

figure 5 a cross-sectional view of a second variant of the channel-like profile with connecting profile as separate elements;

figure 6 a perspective view of a third variant of a channel-like profile including lock-up profile for a double-side shade;

figures 7 and 8 each a perspective view of a pair of possible embodiments of shades, to manufacture with profiles according to the invention.

In the figures the reference numeral 1 is related to the web of material, the width and the height thereof is dependent on the dimensions of the window R, in front of which the shade is suspended. It is clear that herebelow the "phrased" shade is to be used for all possible embodiments of partition means and the shade according to the invention is not only meant for curtains for windows.

The shade 1 is suspended at the upper side to a first or upper border 2 and is provided at the lower side with a second or lower border 3, which is fixed thereto. The upper border 2 can be a

separate beam, but it can also be the upper beam of a window for the glass panel in a building B.

The shade in figure 1 comprises one web of material having a width which is folded over the full length thereof at the lines 4, which folds or pleats can be formed by means of the profile as illustrated herebelow. At the back side of the shade 1 pulling cords 5 are arranged, which are fixed to the lower side at 6 to the lower border 3 and are guided along or in the upper border 2 to the right and continue in the downward hanging end portion 7, which can be manually seized by the user.

From the above it will be clear the pulling down the end portion 7 the cords 5 will be pulled up taking along the lower border 3.

As soon as the lower border 3 contacts a fold-line 4 the shade will be pleated as depicted in figure 1 and 2b. According to the known art the folds 4 are formed by sewing together a strip of web-material 1. There is obtained a back-like element, in which a rigidifying profile can be received.

In the figures 2 and 3 a profile is shown for replacement of said fixation, said profile, as depicted here, comprises a channel-like profile 10, having a  $\Omega$ -like cross section. This channel-like profile 10 is provided with a continuous lip-like element, as rib 11, located at the side of the window R and wherein holes 12 are provided, serving as guiding eyes for the cords 5.

A lock-up profile in the form of a cylindrical rod 13 snugly fits in the space of the channel-like profile 10 and it is adapted to be pushed into said channel-like profile in the direction of the arrows P1 or P2 respectively. In the last event the outwardly protruding lips 14 of the channel-like profile 10 has to be sufficiently flexible in order to spread apart during inserting the lock-up profile 10.

For bringing in the web of material 1, that means a certain strip-like part 14 of said web 1 in the channel-like profile is easily to carry out by folding said strip-like portion inbetween the lips 14 of the profile 10 and thereupon arranging the lock-up profile according the way as described above. As such a folding line 4 according to figure 1 is obtained as is shown in detail in figure 2A.

The cords 5 are guided through the eyes 12 and it will be clear that pulling up the cords 5 the lower border 3 will be pulled up against the superposing rib 11 and channel-like profile 10 directly thereabove. Pulling up further leads to a situation wherein the ribs 11 and profile 10 are laying upon eachother as depicted in figure 2B. The parts of the material-web 1 inbetween, will be folded as depicted in figure 2B.

Lowering the cords 5 will lead to a position of the shade as shown in figure 2A.

As will be clear from the figures 2 and 3, the rib 11 is placed under a certain angle with respect

to the longitudinal middle plane L-L of the channel-like profile 10, which angle is smaller than  $180^\circ$ . When the rib 11 extends in a horizontal way it is clear that the space of the channel-like profile 10 will be directed downwards, what leads to an offset position of the upper web portion 1' with respect to the lower upper portion 1'', so ameliorating the aesthetical appearance of the shade, whereas one cannot see directly into the space of the channel-like profile 10.

It is noted that figure 3 shows a short profile, suitable for locally folding the material-web, so obtaining a variant of the straight fold 4.

Figure 4 shows an embodiment, wherein the lock-up profile is integrally with the channel-like profile 10, said lock-up profile 13 can be folded up in the direction of arrow P3, see the broken line. The web of material is not folded around the lock-up profile 10, but clasped inbetween the profile 10 and 13 respectively.

The embodiment according to figure 5 is comparable with the embodiment according to figure 1 and 2 respectively. However, the lip-like element 11 is replaced by a separate strip having rounded edges, which can be connected to a second channel-like portion of the main profile 10. As shown in figure 5 the profile 10, 11 can be provided with a second main profile 10, so forming a double profile suitable to be used in the embodiment according to figure 6.

Turning now to the embodiment in figure 6 the profile is embodied in a double configuration, comprising two channel-like profiles 10, 10' mutually connected by a common rib 11 such that the profiles 10, 10' are arranged mirror-symmetrical to eachother. Also said rib is here provided with orifices 12 through which the pulling cords 5 are guided. Here two material-webs 1, 1'' are necessary, each can be manufactured of arbitrary and/or different material. Those material-webs 1 are brought into the channel-like profiles 10 in the way as described hereabove, by means of a lock-up profile 13, 13'. Corresponding to the profile as described hereabove, the profile according to figure 6 has a downwardly directed mouth of the channel-like profile 10, 10'. Therefor a desired trapezoidal shape of the curtain is obtained.

In the embodiments as described hereabove, the profiles 10 extend parallel to the lower and upper border respectively. In figure 7 a variant is shown. The profiles 10 are here arranged radially starting from a center point C in the mid of the upper border of a shade 1 suspended thereunder. The upper shade 21 comprises here a pair of segment of a circle, which can be closed from the open position in the direction of the arrow P3. During the closing the profiles 10 turn around the center C and will be pulled up against the first

border, a upstanding beam 20.

Further it is noticed that the profiles 10 in the embodiment according to figure 1 do not need to extend over the full width of the shade. In figure 8 a variant is shown. The web of the shade is here divided in three web portions located adjacent to eachother in which the profiles 10 extend over a single web-like portion only. Moreover, they are offset to eachother, so obtaining a particular pleated appearance.

In this embodiment no use is made from pulling cords 5, but tensioning cords along which the second or lower border is to be shifted by means of the hand grip D. The tensioning cords are formed by a cord starting at E, which is led through the lower border to the right web portion, further through the eyes to the upper border and therethrough in a mirror-symmetrical way back to point E.

With the scope of the invention other variants are possible.

#### Claims

1. Retractable shade, comprising a first border or the like, at least one web of pleatable material, as fabric, fixed thereto, a second border at a distance to said first border, and at least two cord means extending inbetween said first and second border, each of said cords being guided through guiding means fixed to said web **characterized in that** the web is provided on predetermined places with a profile element having one or more guiding means and clasp- ing means for receiving a strip of the material- web in a clasp- ing or pinching way.
2. Retractable shade according to claim 1, wherein the clasp- ing of the material- web is arranged as such that the web-portion at the one side of the clasp- ing is offset with respect to the web-portion at the other side.
3. Retractable shade according to one of the pre- vious claims, wherein the shade comprises two parallel webs at a distance to eachother, and wherein the webs of the shade are connected by common profile elements, **characterized in that** in a section transverse to the two webs of material of the shade, said shade obtains a trapezoidal shape.
4. Retractable shade according to one of the pre- vious claims, **characterized in that** the pro- filed elements are arranged according to a predetermined pattern on the web of material.
5. Retractable shade according to claim 4, **char- acterized in that** the pattern comprises fold-

ing lines offset to eachother.

6. Retractable shade according to claim 4, **char- acterized in that** the pattern comprises a plurality of folding lines diverging from an imaginary center.
7. Profile element suitable for a shade according to one of the previous claims, **characterized in that** the profile is embodied as a channel- like profile having a cross-section enclosing a space over more than  $180^\circ$  to receiving a web of foldable material.
8. Profile element according to claim 7, **char- acterized in that** the clasp- ing means com- prises a lock-up part or parts snugly fitted in channel-like profile.
9. Profile element according to claim 7 or 8, **characterized in that** the or each clamping means are integrally formed with the profile.
10. Profile element according to one of the pre- vious claims, **characterized in that** the outer edges of the profile at the open mouth of the receiving space are bent outwardly over at least  $180^\circ$ .
11. Profile element according to one of the pre- vious claims, **characterized in that** the profile at the side remote of the open mouth of the receiving space, is provided with a member for guiding cords.
12. Profile element according to claim 11, **char- acterized in that** the cord guiding element is provided as a rib extending along said profile, provided with one or more orifices for guiding a cord.
13. Profile element according to previous claims 7- 12, **characterized in that** the cord-guiding- element forms an angle with the longitudinal center plane of said channel-like profile smaller than  $180^\circ$ .
14. Method for folding or pleating a web of ma- terial for a retractable shade, by means of a profile according to one of the claims 7-13, **characterized in that** a certain portion of the web is brought into the open channel-like pro- file and clasped therein.
15. Method according to claim 14, **characterized in that** to clasp- ing said web of material a lock- up profile is brought into said channel-like pro- file with a clamping force.

16. Method according to claim 14, **characterized in that** said web of material is clasped around the lock-up profile in the space of the channel-like profile.

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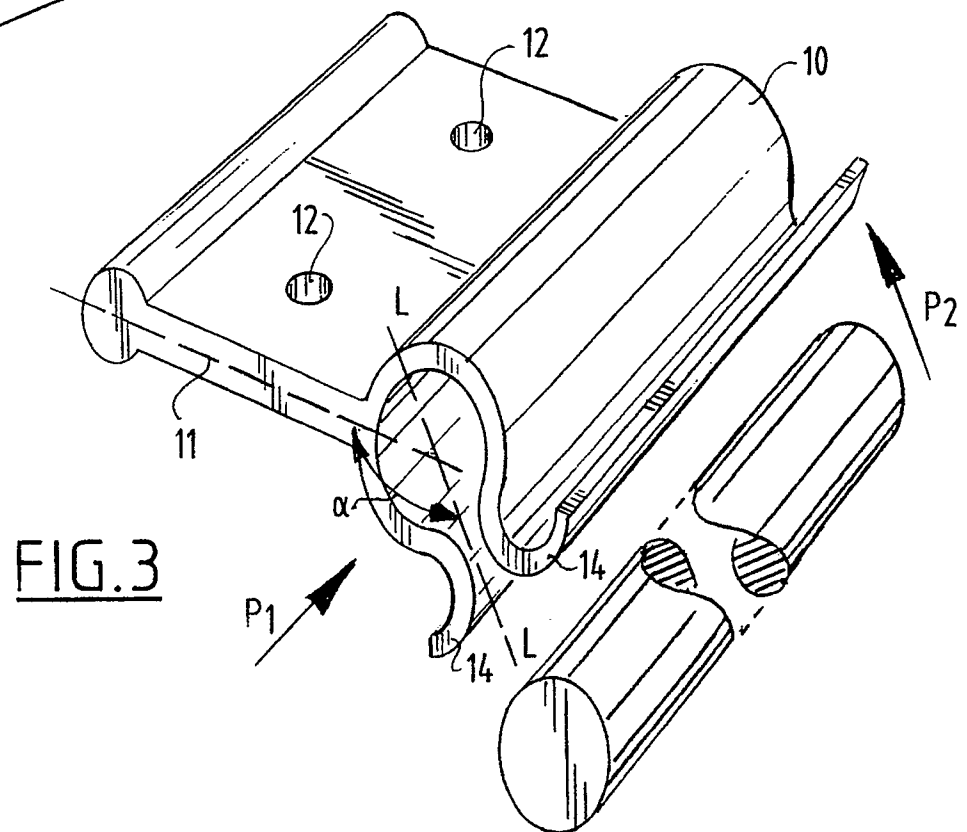
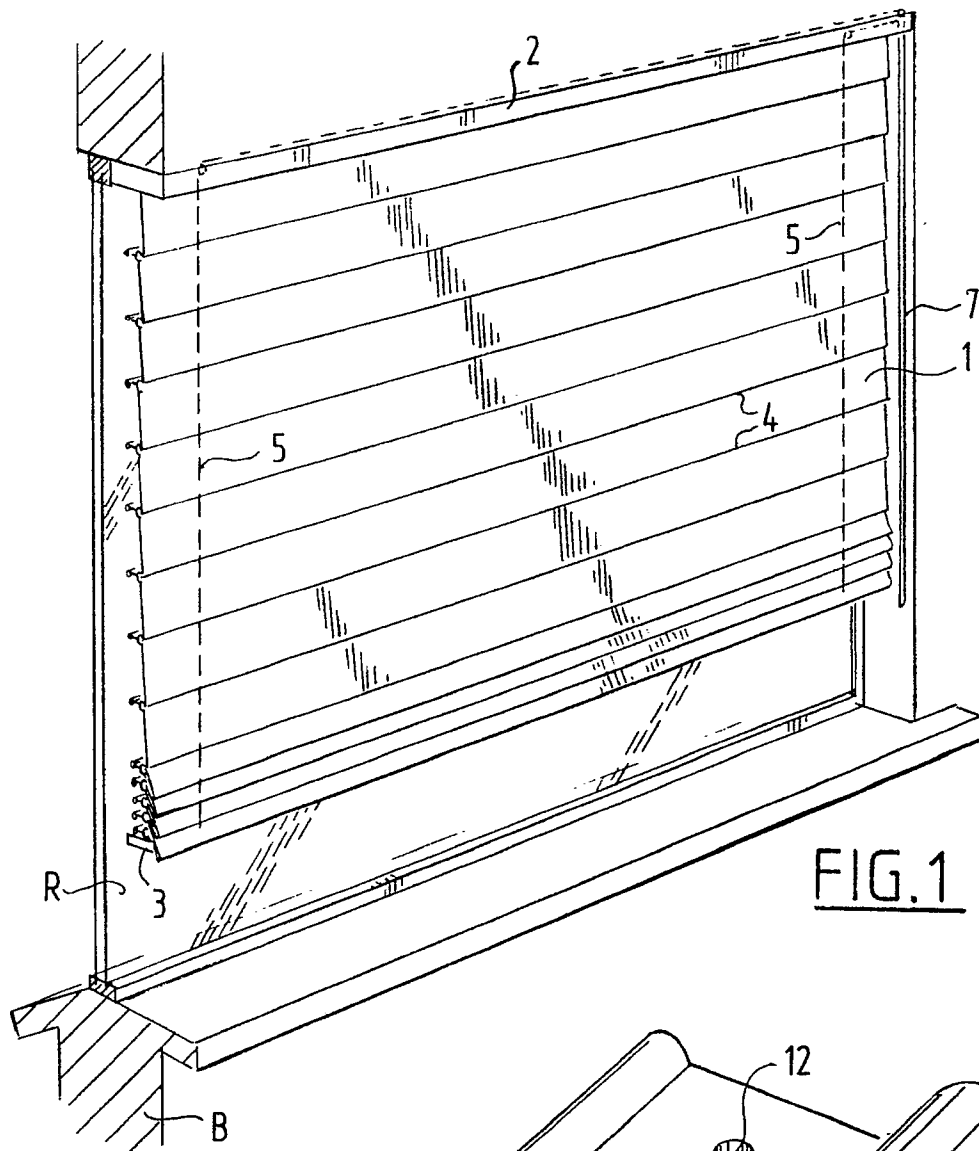
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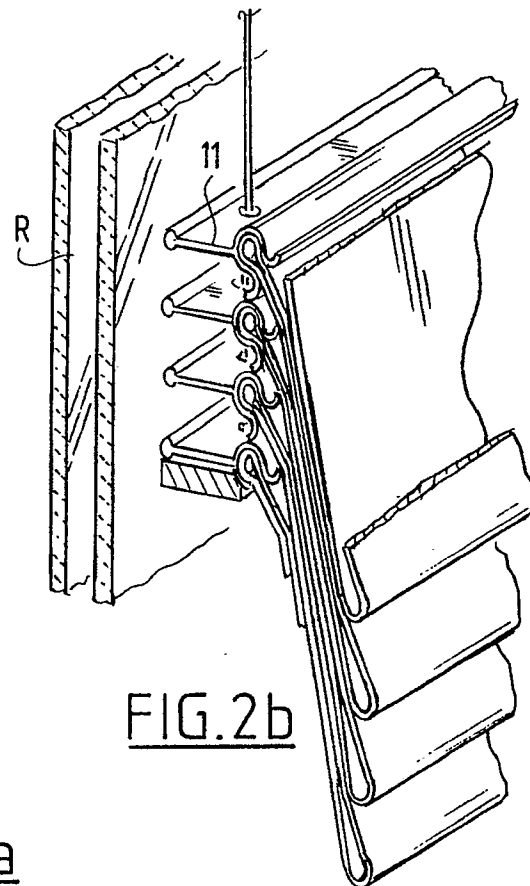
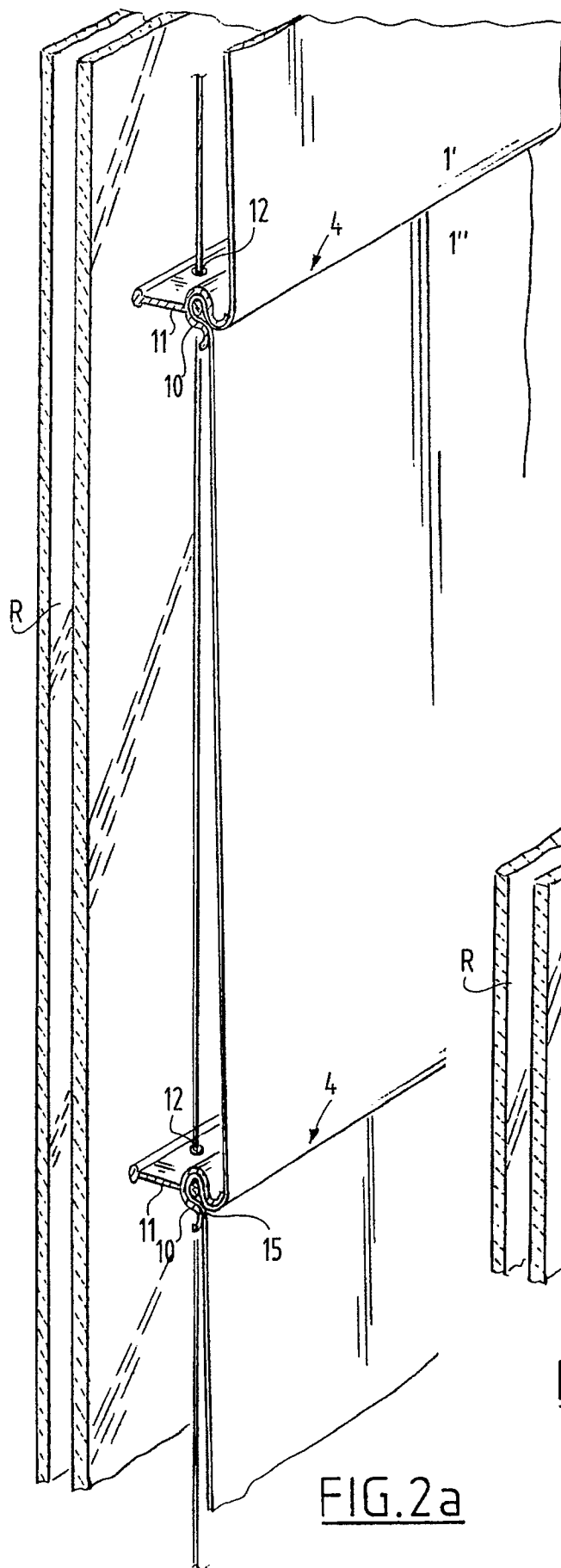
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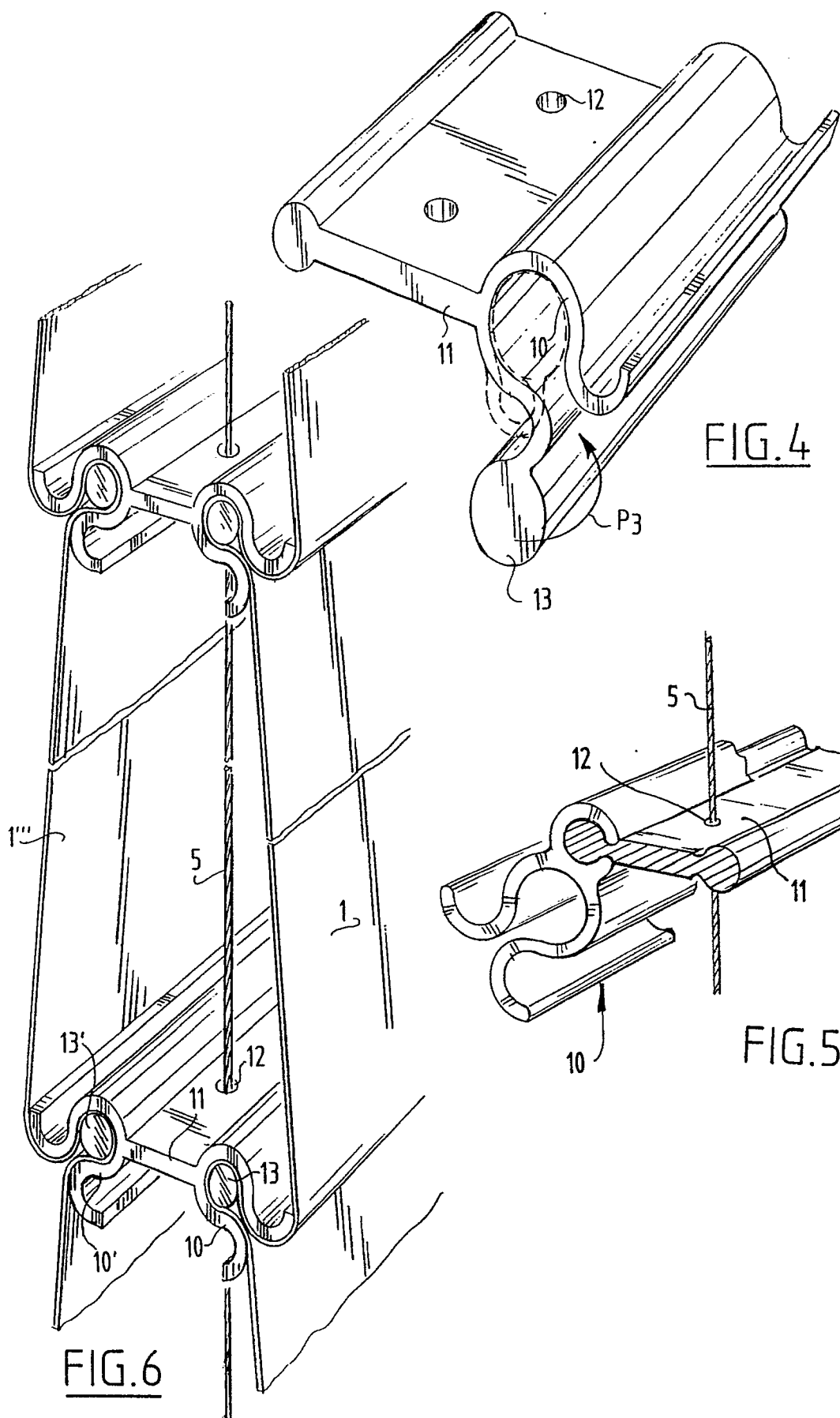
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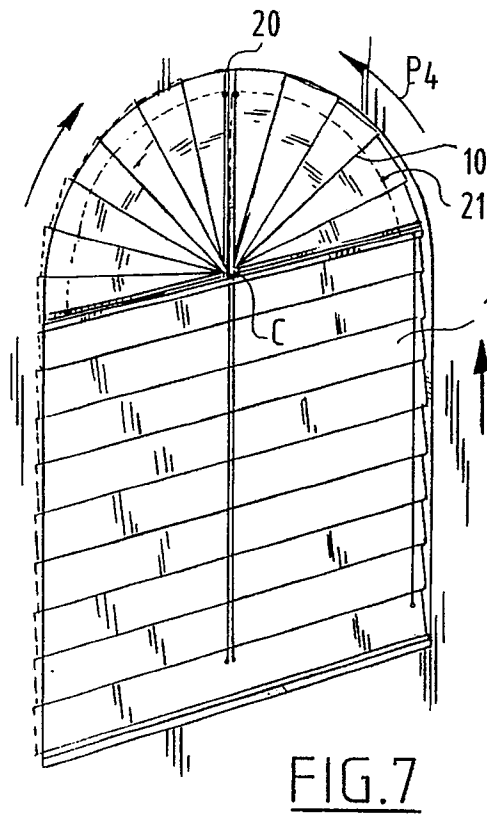
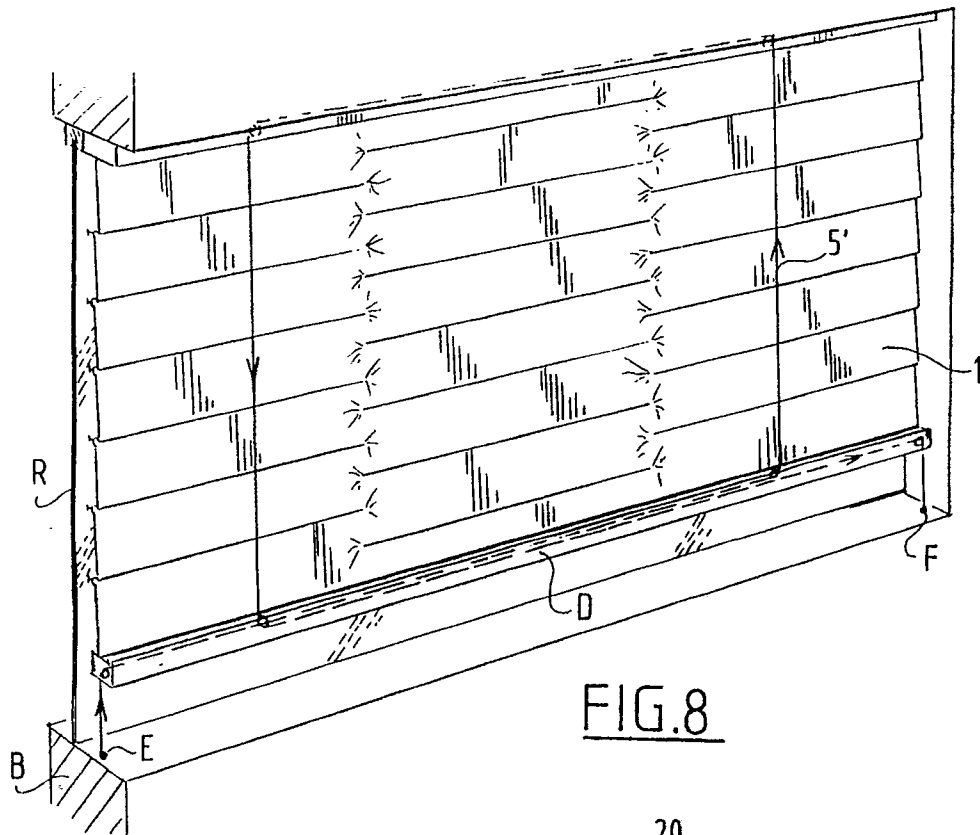
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## EUROPEAN SEARCH REPORT

Application Number

EP 91 20 0804

| 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.5)                              |
| X,Y,A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | FR-A-2 283 278 (NIJMEGEN METAAL B.V.)<br>* page 1, line 24 - page 2, line 9 ** page 3, line 1 - line 21;<br>figures 1-3 *<br>-- --     | 1,2,4,7,8,<br>11-16,6,<br>10,3                 | E 06 B 3/80                                                                |
| X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | DE-A-3 631 919 (GARDINIA VORHANGSCHIENENFABRIK & WÄLDER GMBH & CO.)<br>* column 7, line 7 - line 43; figures 3,16,18 *<br>-- --        | 1,7,8,11,<br>14-16                             |                                                                            |
| Y                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | US-A-3 386 106 (CLEMENS)<br>* column 1, line 70 - column 2, line 3 ** figure 1 *<br>-- --                                              | 6                                              |                                                                            |
| Y,A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | FR-A-1 467 214 (LOUZANNE)<br>* page 1, column 1, line 15 - line 27 ** page 3, column 2,<br>line 38 - line 43 @ figures 2,13 *<br>-- -- | 10,3                                           |                                                                            |
| A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | NL-A-7 803 730 (JANSSEN & FRITSEN B.V.)<br>* the whole document *<br>-- --                                                             | 1-3,7,8,<br>14-16                              |                                                                            |
| A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | FR-A-2 601 575 (RICHARD)<br>* the whole document *<br>-- -- -- --                                                                      | 1,2,7-9,<br>14-16                              |                                                                            |
| The present search report has been drawn up for all claims                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                        |                                                | TECHNICAL FIELDS<br>SEARCHED (Int. Cl.5)<br><br>E 06 B<br>F 16 B<br>A 47 H |
| Place of search<br><br>The Hague                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                        | Date of completion of search<br><br>12 July 91 | Examiner<br><br>PORWOLL H.P.                                               |
| <div>CATEGORY OF CITED DOCUMENTS</div> <div>X: particularly relevant if taken alone</div> <div>Y: particularly relevant if combined with another document of the same category</div> <div>A: technological background</div> <div>O: non-written disclosure</div> <div>P: intermediate document</div> <div>T: theory or principle underlying the invention</div> <div>E: earlier patent document, but published on, or after the filing date</div> <div>D: document cited in the application</div> <div>L: document cited for other reasons</div> <div>&amp;: member of the same patent family, corresponding document</div> |                                                                                                                                        |                                                |                                                                            |