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

(11) Publication number: **0 670 126 A1**

(12) EUROPEAN PATENT APPLICATION

(21) Application number: **94115472.6**

(51) Int. Cl.[6]: **A47C 7/40**

(22) Date of filing: **30.09.94**

(30) Priority: **03.03.94 IT UD940032**

(43) Date of publication of application:
06.09.95 Bulletin 95/36

(84) Designated Contracting States:
BE CH DE FR LI LU NL

(71) Applicant: **EFFEZETA Srl**
Via Manzano 70/1
I-33040 Premariacco (UD) (IT)

(72) Inventor: **Dorigo, Fiorenzo**
Via Guglielmo Marconi 9
I-31015 Conegliano (TV) (IT)

(74) Representative: **Petraz, Gilberto Luigi**
GLP S.r.l.
Piazzale Cavedalis 6/2
I-33100 Udine (IT)

(54) One-piece frame of a seatback adjustable in height.

(57) One-piece frame of a seatback adjustable in height and able to be fitted to office working chairs and advantageously to working chairs of a type suitable for typing work, the frame cooperating with blade means (11) providing support and adjustment of height for connection to the seat surface, the frame being produced with a one-step moulding process performed by coupling a male mould portion acting from the rear (15) of the frame (10) with a mating female mould portion, the frame (10) therefore including a male shaping on its front side (16) and a mating female shaping on its rear (15), the male shaping on its front side (16) defining a seating for the sliding and guiding of the supporting and height-adjustment blade means (11) inserted from below.

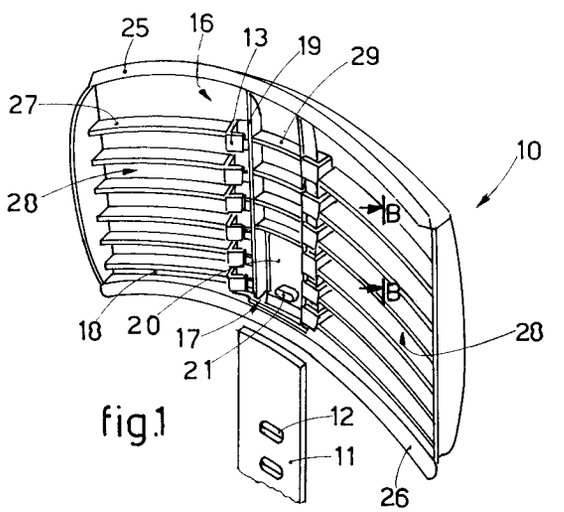

fig.1

EP 0 670 126 A1

This invention concerns a one-piece frame of a seatback adjustable in height, as set forth in the main claim.

The one-piece frame of a seatback adjustable in height according to the invention is applied advantageously, but not only, to office working chairs and in particular to the office chairs known as chairs for typing work.

Office chairs such as the working chairs of a type used for typing, for instance, are known and include separate seats and seatbacks possibly associated with one single supporting and adjusting mechanism.

The seatbacks of the state of the art normally comprise a frame to which the padding is secured generally with an adhesive or is firmly fixed with staples; the padded frame is then upholstered substantially finally with an upholstery fabric applied typically by means of staples, adhesives, elastic bands or stitching.

The office chairs are generally associated with blade means, which connect the seatback to the seat and may provide adjustment and positioning.

The blade means are generally associated with auxiliary guides or brackets normally consisting of a metal, or with guides produced partly during the moulding; the guides or brackets are fitted to, or produced on, the back of the frame and are then usually covered with a strip of upholstery.

The guides or brackets are suitable to cooperate with the blade means by means of reciprocal anchorage and positioning means.

So as to produce on the frame the seating for the positioning of the guides or brackets, or to make these guides at least partly by means of the moulding process, the two shells forming the half-moulds are generally caused to cooperate with a blade element placed between the halfmoulds before injection of the molten material.

The blade element is withdrawn after the cooling and solidification of the material arranged around it.

All the above situation entails complex and expensive moulds, and the moulding process itself is long and complicated.

Moreover, in the chairs of the state of the art the padding is often fitted solidly in a non-removable manner, by adhesives for instance, to the frame of the seatback.

The upholstery fabric too is often applied in such a way as to prevent its removal and possible replacement or maintenance.

All the above situation entails problems as regards production times, costs of material and assembly, versatility of the product and especially recycling of the materials.

In fact, the materials forming the padding and upholstery, while they in themselves can be recycled, can be separated only with difficulty from the frame, and therefore not even a partial recycling of the seatback is possible.

The present applicants have designed, tested and embodied this invention to overcome the shortcomings of the state of the art and to produce an economical, functional and versatile product requiring only modest costs of equipment and embodiment.

This invention is set forth and characterised in the main claim, while the dependent claims describe variants of the idea of the main embodiment.

A purpose of the invention is to provide a one-piece seatback frame of a type which can be adjusted for height and includes a guide structure for the adjustment and positioning means; the guide structure in the frame is produced with a cheap and simple mould and with a quick and readily applicable moulding process.

Another purpose of the invention is to produce a finished structure in which the padding and upholstery fabric can be removably associated with the one-piece frame. When the one-piece frame is made wholly of materials which can be recycled, it is possible to separate readily all the parts of the seatback which can be recycled and thus achieve a great financial and environmental advantage.

The one-piece frame according to the invention cooperates with positioning blade means providing connection to the seat surface and possible adjustment of height and/or inclination.

According to the invention the one-piece frame comprises elements to guide and position the adjustment and positioning blade means, these elements being produced directly in the moulding step.

These guide and positioning elements define the seating for sliding of the blade means advantageously in a central position on the one-piece frame.

This slide seating is produced with a moulding process which does not require elements interposed between the two-half moulds during the injection moulding step.

According to the invention the moulding process includes the use of two half-moulds, which are coupled together when the mould is closed; both the half-moulds bear at the same time male mould elements and mating female mould elements.

In this way a structure is produced which bears a male shaping on the front of the frame and a mating female shaping on the rear of the frame.

According to a variant a plate equipped with a clamping tooth and obtained by being cut on both of its sides directly in the back of the one-piece frame is provided according to the invention at an advantageously lower terminal position in the slide seating of the blade means.

The clamping tooth cooperates with possible slots or holes in the adjustment and positioning blade so as to clamp the seatback at a desired vertical position.

According to another variant the plate is associated resiliently with the stationary part of the frame by the insertion of a coupling spring.

According to a further variant the plate is an element additional to the one-piece frame with the purpose of ensuring a more effective engagement and anchorage at the various positions which can be determined for the one-piece frame.

This additional element, which can be made, for instance, of a metal or of a plastic material stronger than that used to make the frame, can be removably associated with the frame and be dismantled from the frame prior to any recycling of materials.

According to the invention the one-piece frame comprises on its rear side a plurality of strengthening and stiffening ribs.

According to the invention the one-piece frame comprises on its front side a plurality of ribs which define stiffening elements and seatings to support and anchor the padding material.

The one-piece frame comprises at its upper and lower ends ribs the height of which can be altered to enable different heights to be determined for anchorage of the padding and upholstery and thus to enable the height of the seatback to be changed.

These ribs also make possible the anchorage of possible resilient elements to retain the upholstery fabric.

The upholstery fabric can thus be removably secured to the one-piece frame after the padding material has been positioned.

The attached figures are given as a non-restrictive example and show some preferred embodiments of the invention as follows:-

Fig.1 is a three-dimensional view of the front side of the one-piece frame according to the invention in association with an adjustment and positioning blade;

Fig.2 is a frontal view of the rear of the one-piece frame of Fig.1 as fitted to a chair, which is shown partially;

Fig.3 is a view of the one-piece frame of Fig.1 from below;

Fig.4 shows in an enlarged scale a section of the one-piece frame along the line A-A of Fig.2 with the padding fitted;

Fig.5 shows in an enlarged scale a section of the one-piece frame along the line B-B of Fig.1;

Fig.6 shows a lengthwise section of a variant of the one-piece frame of Fig.1 with the padding fitted;

Fig.7 is a knock-down view of a detail of the frame of Fig.6;

Fig.8 is a diagrammatic part view of the righthand side of a variant of the one-piece frame of Fig.2 with the padding fitted;

Fig.9 shows in an enlarged scale a section of a detail of the frame of Fig.8;

Fig.10 shows in an enlarged scale a three-dimensional view of an additional plate employed together with the frame of Fig.8.

A frame 10 shown in the figures possesses a one-piece structure produced by the moulding of a plastic material, which is advantageously of a type which can be recycled.

According to the invention the structure to guide a blade 11 which positions and adjusts the frame 10 at least for height is produced by a moulding process in one single step.

A seating for the sliding and guiding of the adjustment and positioning blade 11 is produced by forming on the front side 16 of the frame 10 two rows of guide teeth 13 advantageously arranged symmetrically in relation to the median lengthwise vertical axis of the frame 10. Each of these rows contains a plurality of guide teeth 13 arranged vertically one above another and parallel along a substantial part of the height of the frame 10.

The guide teeth 13 are produced by a male-type mould portion acting from the rear 15 of the frame 10 and thereby obtaining as a corresponding female impression, a plurality of holes 14 in the rear 15 of the frame 10, the holes 14 corresponding to the guide teeth 13.

The guide teeth 13 in cooperation with a blade introduction hole 17 made advantageously at the middle of the lower edge 18 of the frame 10 define the guide structure on the frame 10 for the insertion from below of the adjustment and positioning blade 11.

The blade 11 comprises a plurality of slots or holes 12 which determine the height of the positions which the frame 10 can take up.

The seating to guide the sliding of the blade 11 is defined between the guide teeth 13 and between two parallel vertical ribs 19 arranged substantially at the lower part of the front side 16 of the frame 10 and symmetrically in relation to the median lengthwise vertical axis of the frame 10.

According to a variant a connecting bridge 30 is included between one guide tooth 13 and the next tooth and has the tasks of stiffening and strengthening the guide tooth 13 and of preventing the padding 31 fitted to the frame 10 from obstructing the blade 11.

The frame 10 comprises for its anchorage in the desired position a plate 20 which is obtained in the examples of Figs.1 and 2 by being cut at its two sides in the bottom portion of the back 15 of the frame 10.

This plate 20 includes a raised extension 22 to enable the plate 20 to be operated by hand from a seated position and bears at its front an attachment prong 21, which cooperates with the slots or holes 12 in the plate 11 that determine the height of the positions of the frame 10.

According to a variant the plate 20 is associated with the stationary part of the frame 10 by means of spring means 32, which in this case are secured by their ends being anchored in respective seatings, of which the first 33 is provided in the stationary part of the frame 10, while the second 34 is made in the plate 20.

These spring means 32 make it easier for a user of the frame to position and adjust the seatback and make the clamping of the seatback in the desired position more secure and effective.

According to a variant the plate is not obtained by cutting the back 15 of the frame 10; instead, an auxiliary plate 120 is used.

This auxiliary plate 120 is secured advantageously to the back 15 of the frame 10 substantially at the lower portion of the back 15 by temporary attachment means (see Figs.8, 9 and 10).

In the case shown the auxiliary plate 120 is associated with the frame 10 by a resilient fixture pushbutton 35 inserted in a mating clamping hole 36 made in the frame 10.

A cleft 23 is also provided in the frame 10 and enables an attachment prong 121 of the auxiliary plate 120 to cooperate with the slots or holes 12 in the blade 11.

The auxiliary plate 120 is advantageously made of a material stronger than the material composing the frame 10; this stronger material may be a metal, for instance, and may also be of a type which cannot be recycled. This enables the stresses due to the operations of adjusting the height of the frame 10 to be withstood more effectively.

The auxiliary plate 120 is also disengaged from the frame 10 when the materials are being recycled.

The auxiliary plate 120 too can be associated with the spring means 32.

The frame 10 according to the invention comprises on its back 15 a plurality of strengthening and stiffening ribs 24 and also comprises on its front at the sides of the adjustment and positioning blade 11 a plurality of ribs 27 which define seatings 28 for the padding 31 of the frame 10.

The padding 31 according to the invention is merely inserted and supported in the frontal seatings 28 of the frame 10 and does not require the use of adhesives, staples or other fixture means which substantially cannot be removed.

The frame 10 includes a plurality of substantially horizontal stiffening ledges 29 in its central zone in the part not occupied by the resilient plate 20.

The frame 10 according to the invention comprises an upper rib 25 and lower rib 26, which can have differing heights and thus can determine differing heights of the seatback made with the frame 10.

These upper and lower ribs 25-26 have their lateral ends advantageously radiused or rounded.

These ribs 25-26 make possible the anchorage of advantageously elastic elements to retain the upholstery fabric of the frame 10; in this way the fabric can be removably applied and can be readily separated from the frame 10.

Claims

1. One-piece frame of a seatback adjustable in height and able to be fitted to office working chairs and advantageously to working chairs of a type suitable for typing work, the frame cooperating with blade means (11) providing support and adjustment of height for connection to the seat surface, the frame being characterised in that it is produced with a one-step moulding process performed by coupling a male mould portion acting from the rear (15) of the frame (10) with a mating female mould portion, the frame (10) therefore including a male shaping on its front side (16) and a mating female shaping on its rear (15), the male shaping on its front side (16) defining a seating for the sliding and guiding of the supporting and height-adjustment blade means (11) inserted from below.

2. One-piece frame as in Claim 1, which comprises in itself sliding and guide means for the supporting and height-adjustment blade means (11), means (31) to position and support padding material (31) and means to anchor (25-26) upholstery material.

3. One-piece frame as in Claim 2, in which the means to position and guide the supporting and height-adjustment blade (11) comprise at least two facing rows of guide teeth (13), each row including a plurality of substantially parallel guide teeth (13) superimposed vertically on each other, the guide teeth (13) cooperating with vertical ribs (19) to define the seating for the sliding of the supporting and height-adjustment blade means (11).

4. One-piece frame as in Claim 3, in which a stiffening bridge (30) to retain padding (31) is included between one guide tooth (13) and the next one.

5. One-piece frame as in any claim hereinbefore, which comprises a plate (20-120) that includes terminally at least attachment means (21-121) which cooperate with the supporting and height-adjustment blade means (11) in determining the height of the seatback.

6. One-piece frame as in Claim 5, in which the plate (20) is obtained by cutting it directly along two of its sides in the back of the one-piece frame (10).

7. One-piece frame as in Claim 5, in which the plate (20) is an auxiliary element removably associated with the one-piece frame (10).

8. One-piece frame as in any claim hereinbefore, in which the plate (20-120) is coupled to the frame (10) by resilient means (32).

9. One-piece frame as in any claim hereinbefore, in which the means to position and support the padding material (31) consist of transverse ribs (27) that define seatings (28) for the padding material.

10. One-piece frame as in any claim hereinbefore, which comprises strengthening and stiffening ribs (24) on its back (15).

11. One-piece frame as in any claim hereinbefore, which comprises at least one lower rib (26) of a height that can be changed.

12. One-piece frame as in any claim hereinbefore, which comprises at least one upper rib (26) of a height that can be changed.

13. One-piece frame as in any claim hereinbefore, which is made wholly of materials which can be recycled.

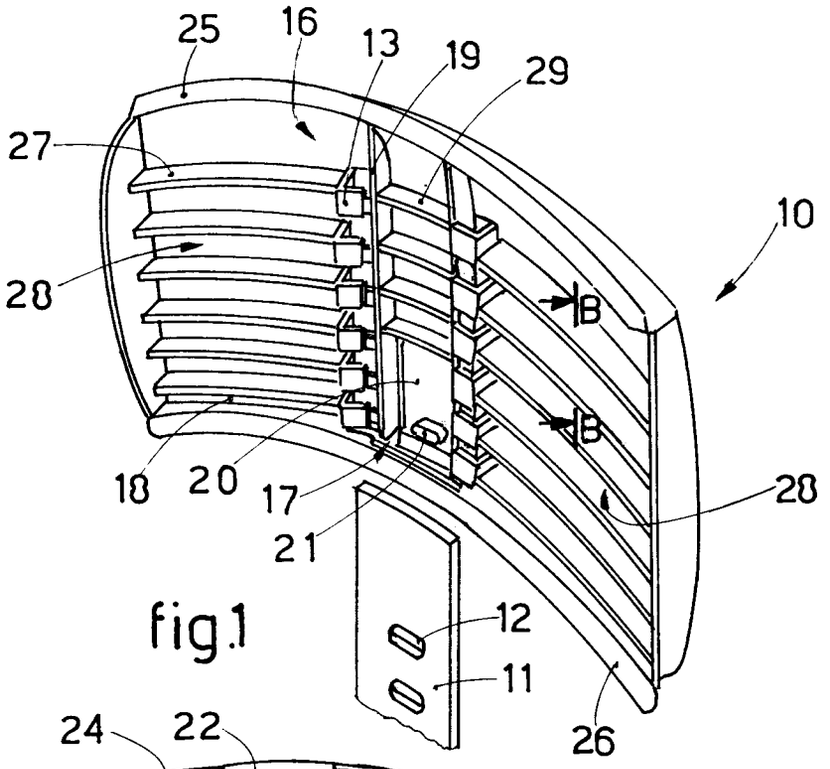

fig.1

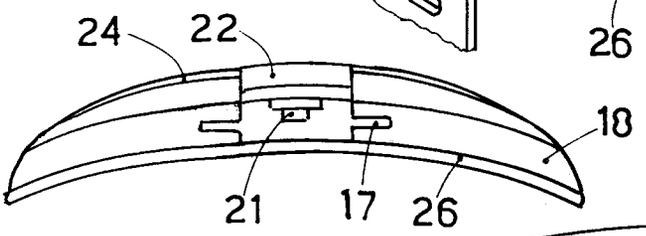

fig.3

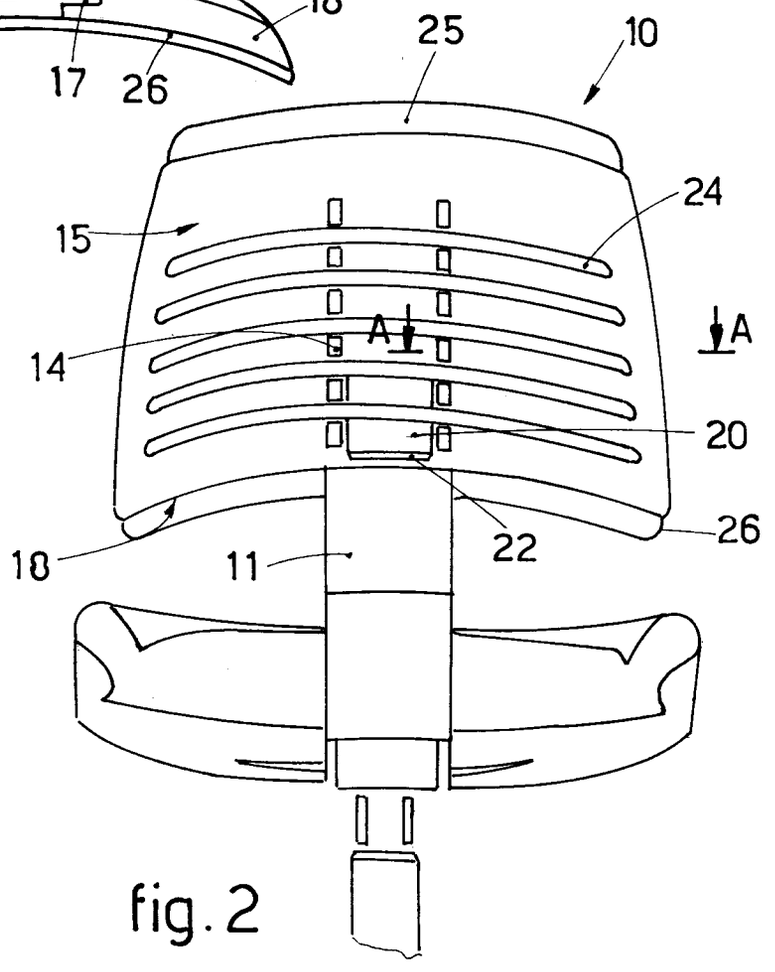

fig.2

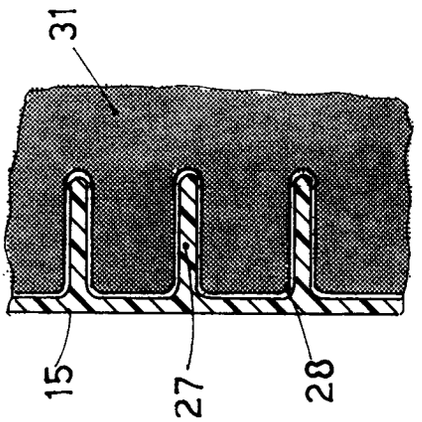

fig.5

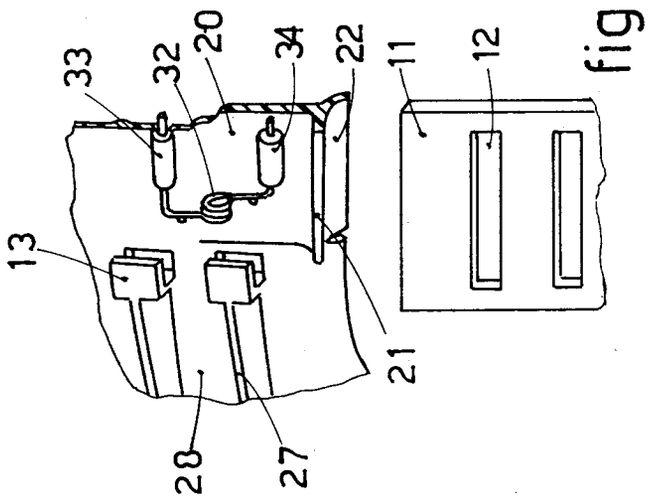

fig.7

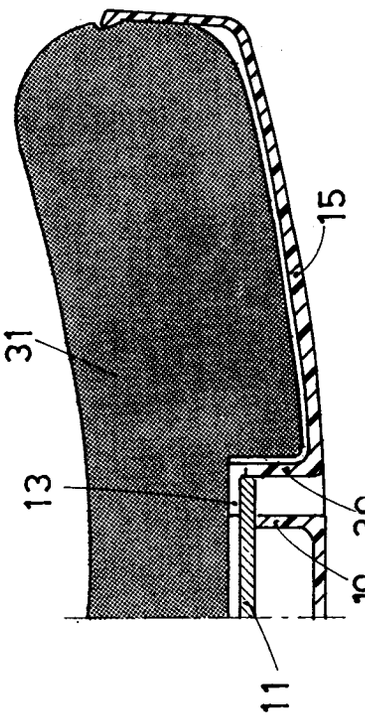

fig.4

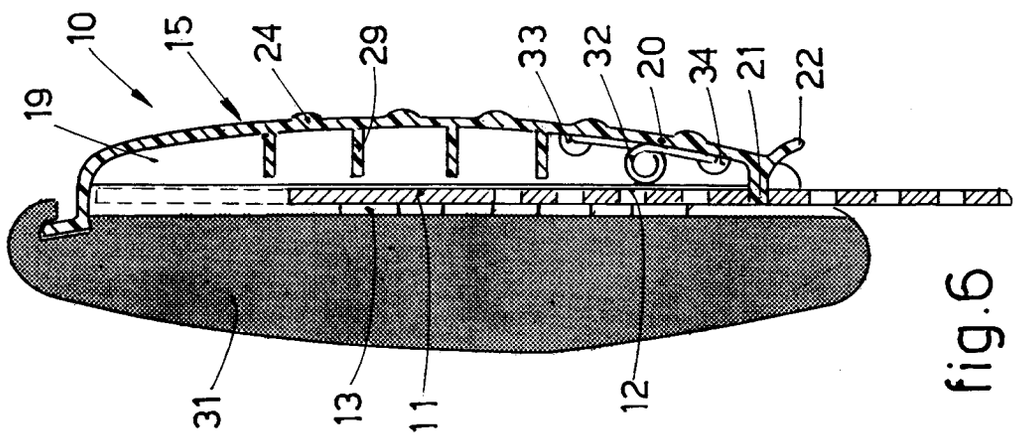

fig.6

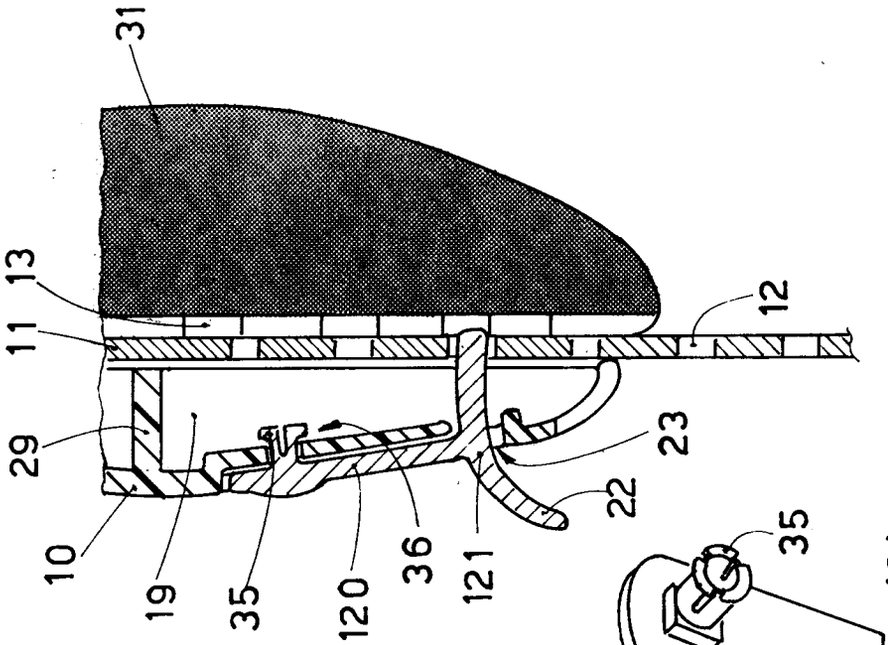

fig.9

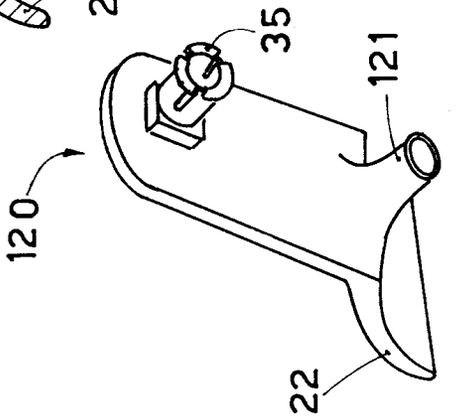

fig.10

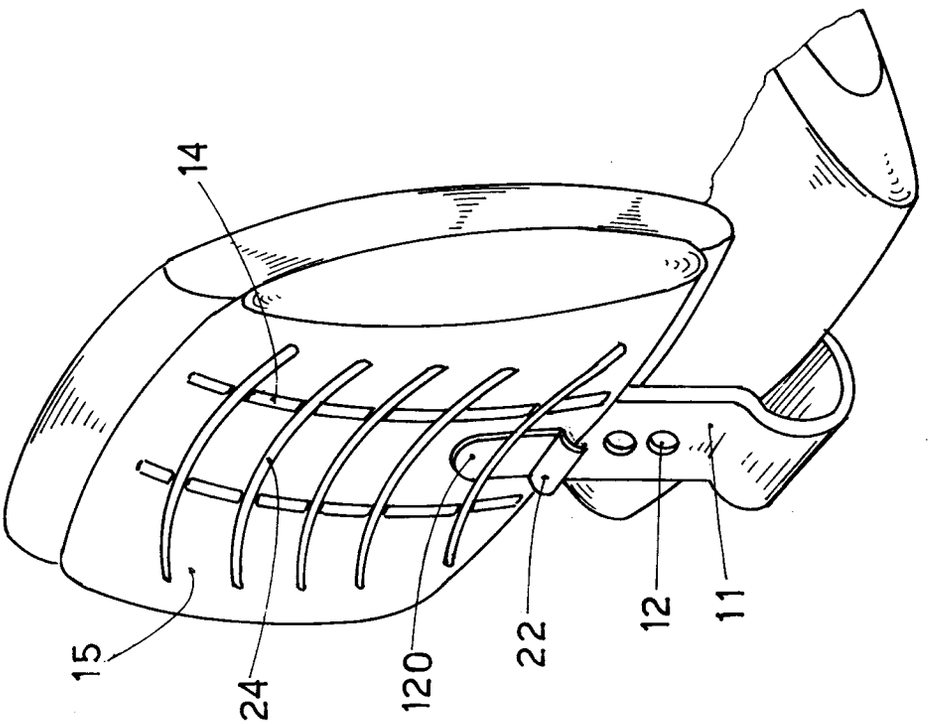

fig.8

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 94 11 5472

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.6)
A	EP-A-0 136 796 (FAVARETTO) * page 12, line 24 - page 16, line 9; figures 11-17 * -----	1,3,5,7, 10,13	A47C7/40

TECHNICAL FIELDS SEARCHED (Int.Cl.6)

A47C

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	1 June 1995	Mysliwetz, W

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

EPO FORM 1503 03.82 (P04C01)