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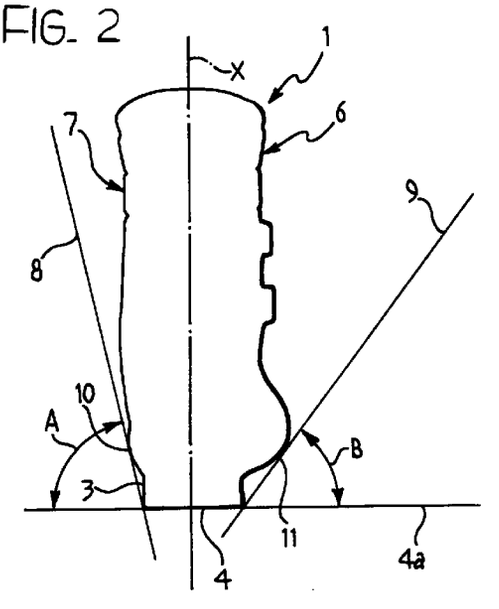
(54) A carving ski boot

(57) The "CARVING" ski boot described comprises a shell (2) having a sole (3) with a base (4) of predefined outline (5) and respective inner and outer side walls (6,7), in which an inner angle (A) which can limit the inward inclination of the shell (2) is defined between the plane (8) tangential both to the inner side wall (6) and to the corresponding outline (5) of the sole (3) and the plane (4a) of the base (4), and in which an outer angle (B) which can limit the outward inclination of the shell (2) is defined between the plane (9) tangential both to the outer side wall (7) and to the corresponding outline (5) of the sole (3) and the plane (4a) of the base; the inner and outer side walls (6,7) are shaped and arranged relative to the sole (3) in a manner such that the ratio between the outer angle (B) and the inner angle (A) is greater than or equal to 0.8 and the outer angle (B) is greater than or equal to 53°, at least within the range of boot sizes between the values of 23.0 and 31.0 on the MONDOPOINT scale.

FIG. 2



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Description

The present invention relates to a ski boot designed particularly for use with "CARVING" skis, according to the preamble to the main claim.

The "CARVING" technique requires the use of special skis which are also defined in the art by the term "sidecut" and which, because the tip and tail portions are formed with wider bases than the central region (waisting), enable the ski to be controlled particularly easily. A CARVING ski mainly improves control of the path followed during turning. On the other hand, the CARVING technique involves a different position of the skier during turning which often involves a greater inclination of the legs (and of the skier's body as a whole) than conventional techniques, relative to the perpendicular to the snow surface. However, this increased sideways inclination is limited by the geometry of the boot. When predetermined limit angles at which the shell is brought into contact with the snow surface have been reached, there is in fact a considerable reduction in the grip of the ski and the skier may fall. In order to achieve the greater sideways inclinations required by the CARVING technique, it is known to interpose spacer plates between the ski and the boot binding so as to increase the angles of inclination which can be reached without contact between the boot and the snow surface. However, these spacer plates have the disadvantage of increasing the weight of the ski-binding-boot unit as well as reducing the flexibility of the ski in its central region. The use of these spacer plates is also quite laborious and expensive.

The problem upon which the present invention is based is that of the provision of a "CARVING" ski boot which is designed structurally and functionally to avoid all of the problems complained of with reference to the prior art mentioned.

This problem is solved by the invention by a ski boot formed in accordance with the following claims.

The characteristics and advantages of the invention will become clearer from the detailed description of a preferred embodiment thereof, given by way of non-limiting example with reference to the appended drawings, in which:

- Figure 1 is a schematic, sectioned, side-elevational view of a ski boot formed in accordance with the present invention,
- Figures 2, 3 and 4 are schematic, front elevational views of the ski boot of the preceding drawing in three different positions relative to a reference plane,
- Figure 5 is a section taken on the line V-V of Figure 1,
- Figures 6 to 9 are tables described in detail below.

With reference to the drawings mentioned, a ski boot particularly designed for use with "CARVING" skis, formed in accordance with the present invention, is indicated 1.

The boot 1 comprises a shell 2 formed by moulding from a plastics material, with a sole 3 having a base 4 (defined as the plane of contact of the sole 3 with the ground) the outline of which is indicated 5. The shell 2 also comprises an inner side wall 6 and an outer side wall 7 on its inner and outer sides, respectively. "Inner side" and "outer side" are intended to indicate the side of the boot which faces the corresponding inner side of a boot of the same pair in use, and the opposite side, respectively.

With particular reference to Figure 5, the plane tangential both to the inner side wall 6 and to the outline 5 of the sole 3 of the corresponding inner side of the boot is indicated 8. An angle, indicated as an inner angle A, is defined between the plane 8 and the plane 4a of the base 4.

Correspondingly, the plane tangential both to the outer side wall 7 and to the outline of the sole 3 on the outer side of the boot is indicated 9. The angle defined between the plane 9 and the plane 4a of the base 4 is indicated as an outer angle B.

The angles A and B represent the maximum angles of inclination of the shell 2 to the plane 4a permitted by the geometry of the side walls 6 and 7 on the inner and outer sides of the boot 1, respectively.

It should be understood that, in practice, during skiing, these angles do not correspond to the skier's maximum inclination to the snow surface but are correlated to this inclination, as will be explained further below.

In Figure 3, the boot 1 is shown in the position of maximum permitted outward sideways inclination, whereas in Figure 4, the boot 1 is shown in the position of maximum inward sideways inclination.

It will be noted that both the inner and the outer side walls of a ski-boot shell have regions which project more relative to a median plane X in the central-front portion which corresponds to the bearing region of the sole of the user's foot; in these regions, which are generally located in corresponding positions on both side walls, the shell 2 normally has a convex shape, indicated 10 for the inner side wall 6 and 11 for the outer side wall 7. These regions tend to "touch" the snow surface during turning when the boot reaches the maximum permitted inclination.

According to a principal characteristic of the boot of the present invention, the inner and outer side walls 6 and 7 and, in particular, the convex portions 10, 11 thereof, are formed and arranged relative to the sole 3 in a manner such as to achieve inner angles A and outer angles B of the planes 8, 9 tangential to the shell and to the base 4 equal to those given in Table C of Figure 8, in which the data are expressed without a tolerance of $\pm$ 1° and relate to shells for adults with standardized soles in accordance with ISO 5355, that is having widths equal to 69 $\pm$ 2 mm. In this table, each pair of angles A and B relates to a specific boot size expressed in the

standardized MONDOPOINT scale for adult shells (ISO 5355).

Table D of Figure 6 gives the sizes provided for by the standardized MONDOPOINT scale, Column A relating to shells for adults and Column C to shells for children, and each size expressing the "theoretical" length (in cm) of the foot to be housed in the boot.

Table E of Figure 7 gives the scales for converting MONDOPOINT sizes into other internationally recognized scales.

It will be noted that, for a preferred embodiment of the boot of the invention, for each size given in Table C and included within the MONDOPOINT size range of 23.0-31.0, a ratio greater than 0.8 and, in particular, between 0.91 and 0.93 is obtained between the outer angle B and the inner angle A.

It is also pointed out that, for each size provided for in Table C, the inner angle A is greater than or equal to 60°, particularly, between 60° and 68°, and the outer angle is greater than or equal to 53°, particularly between 56° and 63°.

Table F of Figure 9 gives the inner angles A and the outer angles B which can be achieved for MONDOPOINT sizes 23.5, 26.5 and 31.0 with the boot of the present invention, with a shape and arrangement of the side walls such as to ensure an adequate degree of fit, comfort, general functional capacity and appearance thereof.

Comparisons have been made, with reference to MONDOPOINT size 26.5, between the values of the angles A and B found in some boots available on the market and representative of the current state of the art and CARVING boots formed in accordance with the present invention. In the known boots, the ratio between the outer angle B and the inner angle A (B/A) was always less than 0.8 and, in particular, between 0.6 and 0.76; the outer angle B of the known boots had values, for size 26.5, of between 42° and 49°, and thus much smaller than those obtained with the boot of the invention.

In Figure 1, the shell 2 of the boot of the present invention is shown in continuous outline and the inner profile of a conventional shell is shown in broken outline. It will be noted that the inner profile of the cavity for housing the skier's foot is substantially raised relative to the base 4 of the sole 3 in order to achieve the different geometry of the side walls 6, 7 which characterizes the present invention.

It should also be pointed out that, according to the invention, the sum of the inner and outer angles A, B (A+B) is greater than or equal to 110° for sizes between 28.0 and 31.0, greater than or equal to 115° for sizes between 25.0 and 27.5, and greater than or equal to 125° for sizes between 23.0 and 24.5.

It will be noted that the angles A and B given above do not represent the maximum angles of inclination which can actually be achieved by the ski-boot unit during CARVING since they are measured with reference to the surface of the base of the boot without account being taken of the thickness of the ski. The angles of inclination which can actually be achieved are therefore greater than those given in Tables C and F because the shell is raised further relative to the snow surface owing to the thickness of the ski.

Amongst the advantages of the invention it is pointed out that, with the boot of the present invention, it is possible to achieve very marked angles of sideways inclination without thereby affecting the design characteristics of the ski and without altering the weight of the boot-ski-binding unit.

Claims

1. A "CARVING" ski boot with an inner side and an outer side, comprising:

   - a shell (2) formed by moulding from a plastics material and having a sole (3) with a base (4) of predefined outline (5),
   - an inner side wall (6) and an outer side wall (7) on respective sides of the shell (2),
   - an inner angle (A) which can limit the inward inclination of the shell being defined between the plane (8) tangential both to the inner side wall (6) and to the corresponding outline (5) of the sole (3) and the plane (4a) of the base (4), and
   - an outer angle (B) which can limit the outward inclination of the shell being defined between the plane (9) tangential both to the outer side wall (7) and to the corresponding outline (5) of the sole (3) and the plane (4a) of the base (4),

   characterized in that the inner and outer side walls (6,7) are shaped and arranged relative to the sole (3) in a manner such that the ratio between the outer angle (B) and the inner angle (A) is greater than or equal to 0.8 and the outer angle (B) is greater than or equal to 53°, at least within the range of boot sizes between the values of 23.0 and 31.0 on the MONDOPOINT scale.

2. A boot according to Claim 1 in which the ratio between the outer angle (B) and the inner angle (A) is greater than or equal to 0.9.

3. A boot according to Claim 1 or Claim 2, in which the outer angle (B) is greater than or equal to 55°, at least in the range of sizes between 23.0 and 31.0 on the MONDOPOINT scale.

4. A boot according to Claim 3, in which the ratio between the outer angle (B) and the inner angle (A) is between 0.9 and 0.93.

5. A boot according to Claim 3 or Claim 4, in which, for

the range of sizes between 23.0 and 31.0, the inner angle (A) is greater than or equal to 60°.

6. A boot according to one or more of the preceding claims, in which, for the range of sizes between 23.0 and 31.0, the outer angle (B) is between 55° and 63°.

7. A boot according to one or more of Claims 1 to 6, in which, for a range of sizes of from 28.0 to 31.0 on the MONDOPOINT scale, the sum of the outer and inner angles (B,A) is greater than or equal to 110°.

8. A boot according to one or more of Claims 1 to 6, in which, for a range of sizes of from 25.0 to 27.5 on the MONDOPOINT scale, the sum of the outer and inner angles (B,A) is greater than or equal to 115°.

9. A boot according to one or more of Claims 1 to 6, in which, for a range of sizes of from 23.0 to 24.5 on the MONPOPOINT scale, the sum of the inner and outer (A,B) angles is greater than or equal to 125°.

10. A boot according to one or more of the preceding claims, in which said shell (2) is of the kind standardized in accordance with ISO 5355, that is with the sole (3) having a width substantially equal to 69 ± 2 mm.

FIG. 1

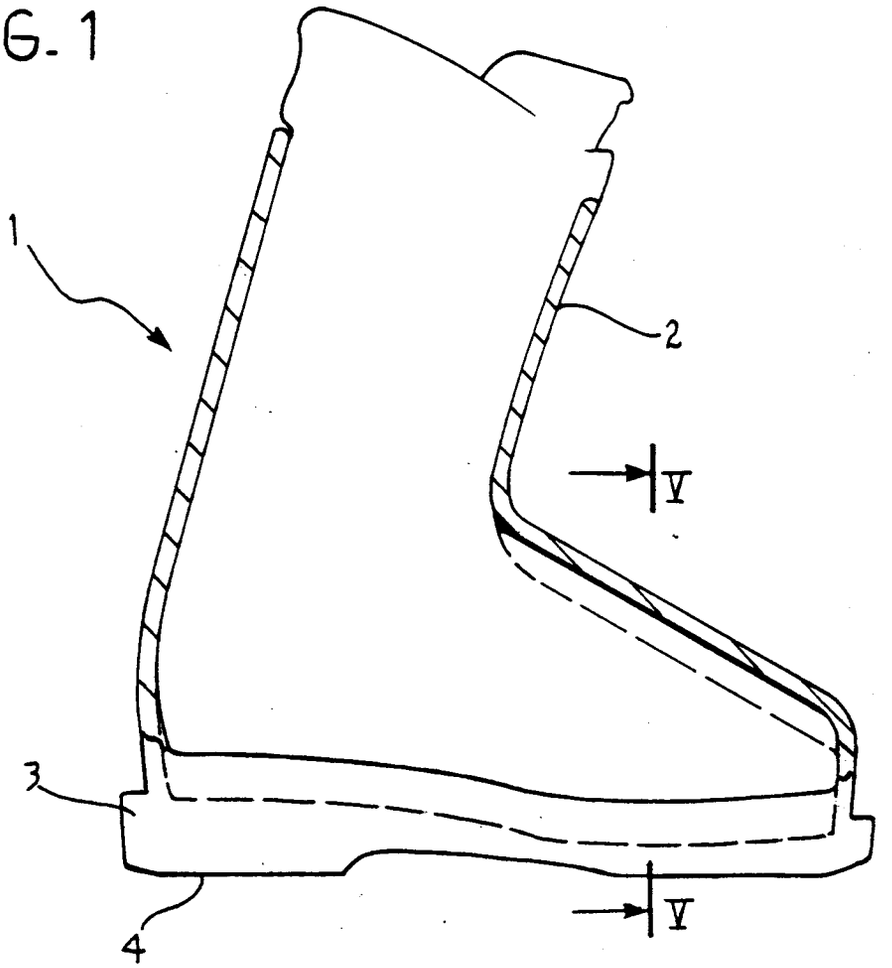


FIG. 5

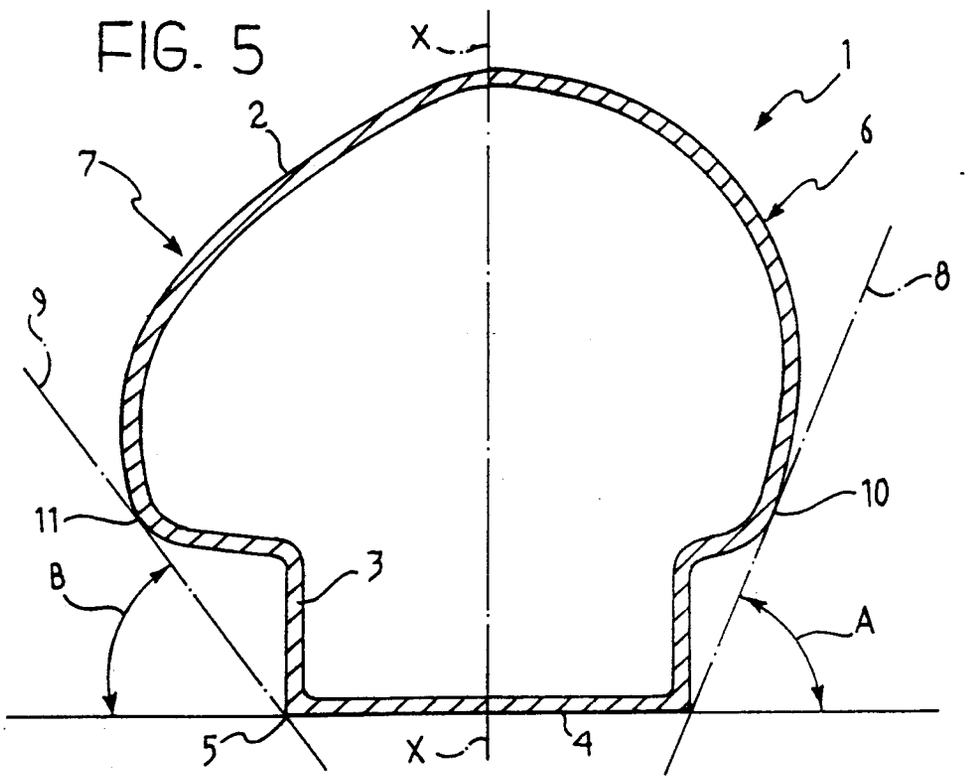


FIG. 2

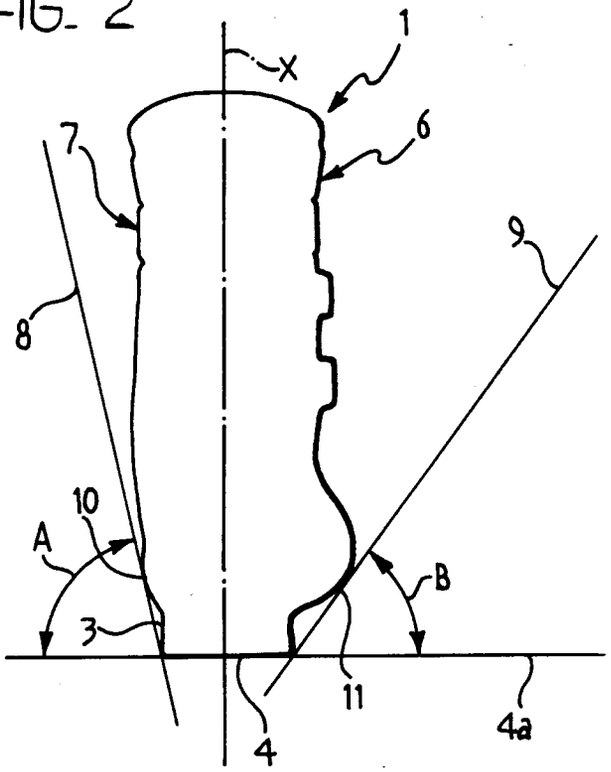


FIG. 3

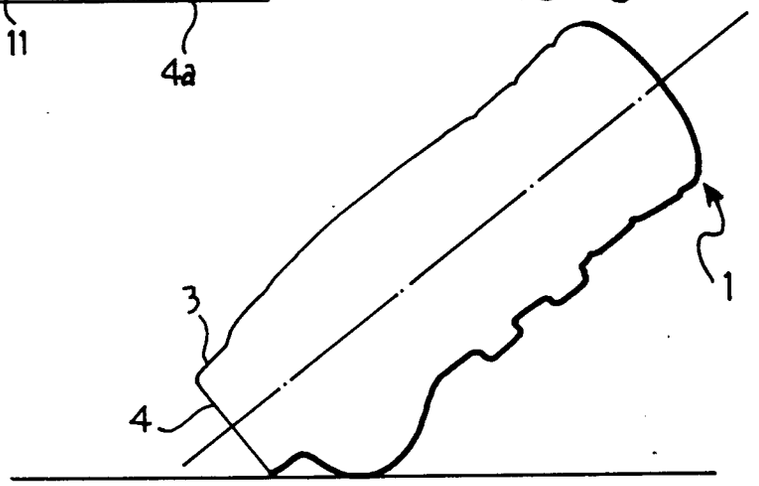


FIG. 4

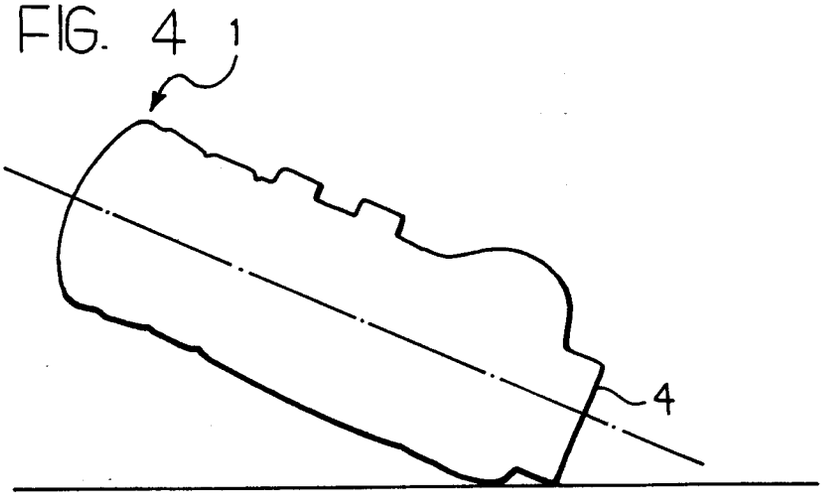
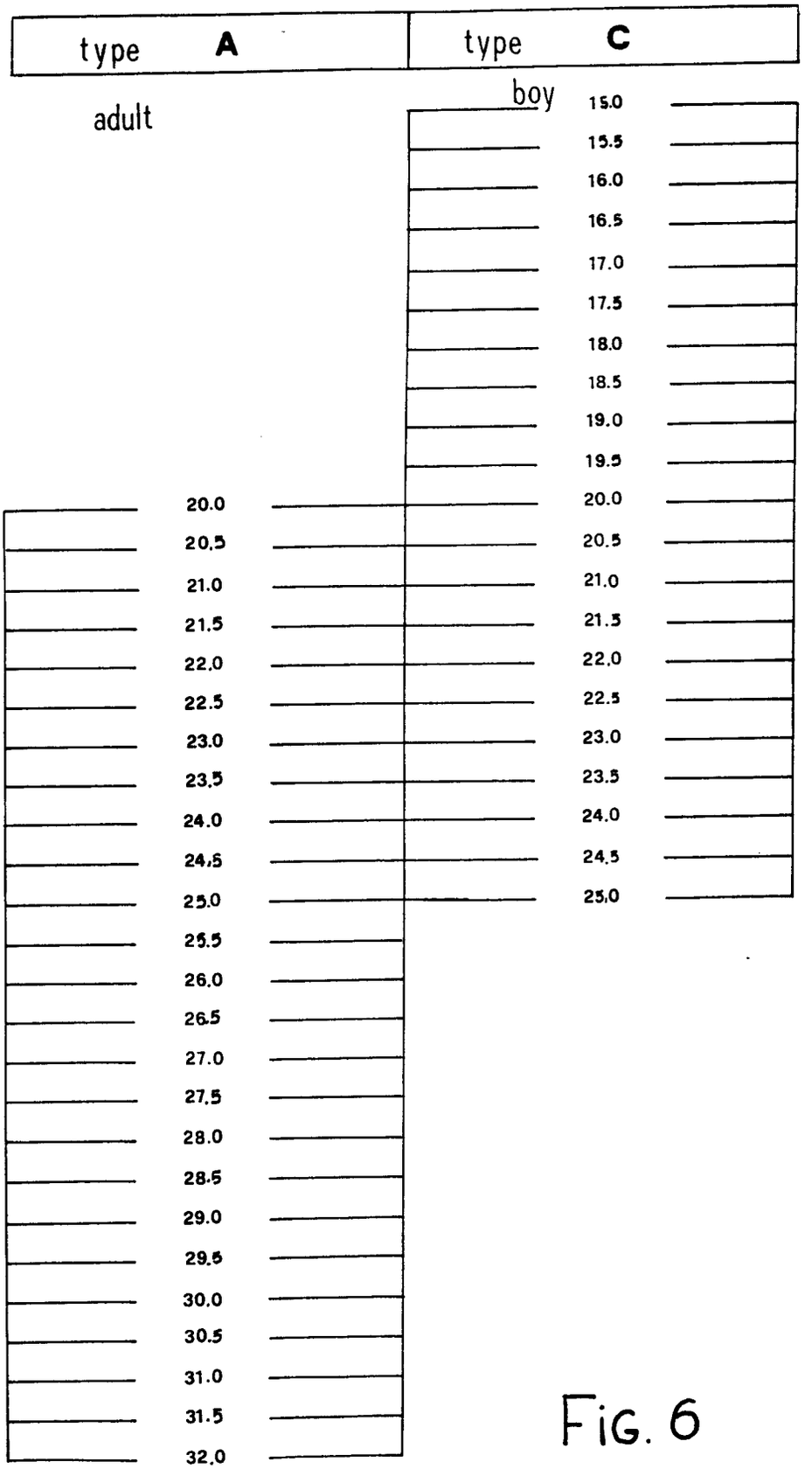


TABLE D


type A
type C
adult
boy
15.0
15.5
16.0
16.5
17.0
17.5
18.0
18.5
19.0
19.5
20.0
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27.5
28.0
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30.0
30.5
31.0
31.5
32.0

Fig. 6

TABLE E

SIZES CONVERSION CHART

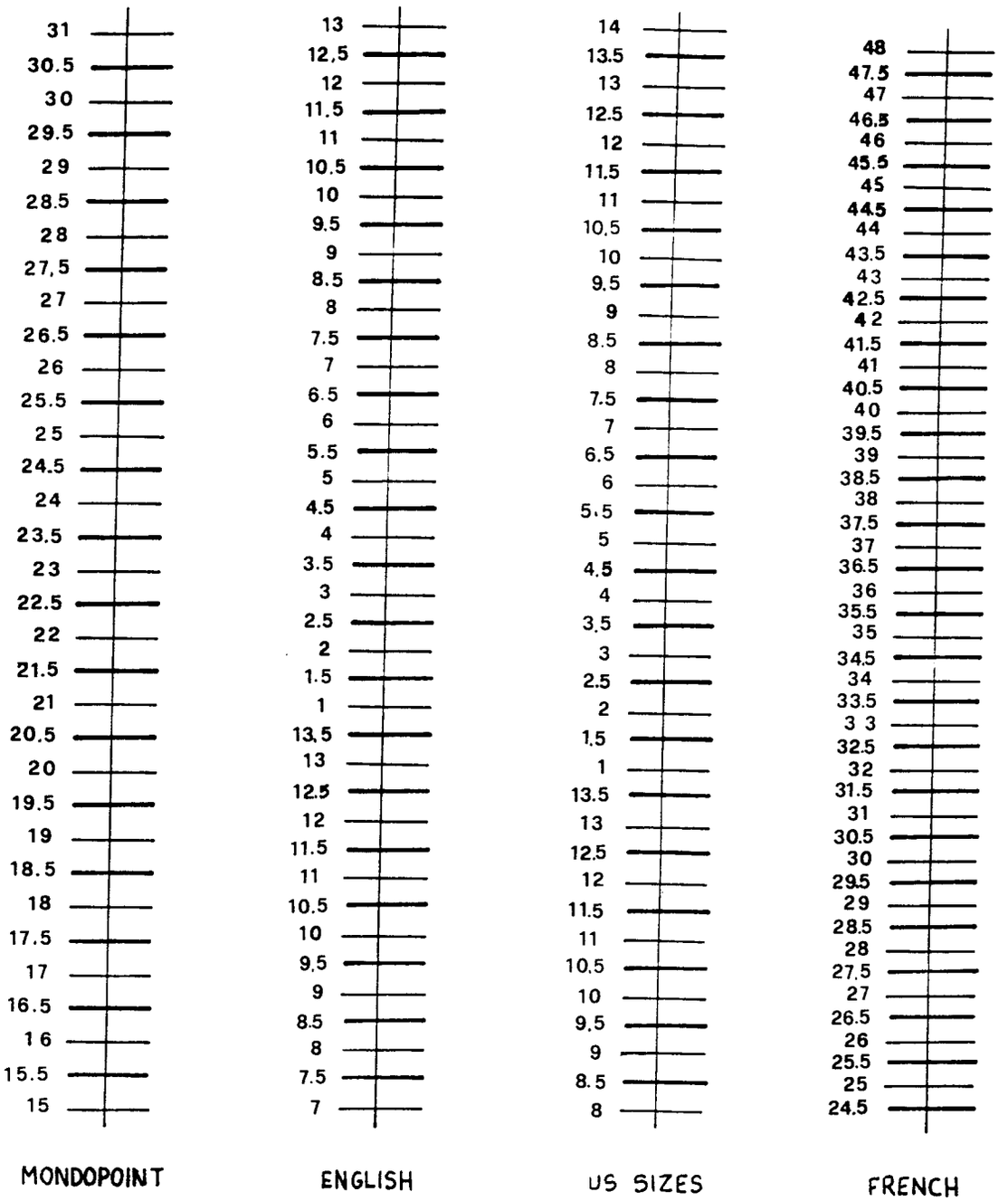

FIG. 7

TABLE C

SIZE mondopoint	A (°)	B (°)	B/A
23.0	68	63	0.92
24.5	67	62	0.92
25.5	67	62	0.92
26.5	67	61	0.91
27.5	65	60	0.92
28.5	64	59	0.92
29.5	63	58	0.92
31.0	60	56	0.93

FIG. 8

TABLE F

SIZE mondopoint	A (°)	B (°)
23.5	76.5	62.6
26.5	72.9	59.5
31.0	68.4	55.8

FIG. 9

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 97 20 3248

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)
X	DE 19 43 815 U (KASTINGER & CO) 4 August 1966 * page 1, paragraph 2 - paragraph 3; figures *	1	A43B5/04
X	US 3 597 862 A (VOGEL RAIMUND W) 10 August 1971 * figures 5,6,10 *	1	
X	EP 0 572 775 A (SALOMON SA) 8 December 1993 * figures 3,4 *	1	
X	DE 20 05 900 A (LUTHER AUSTIN & SONS LTD) 24 September 1970 * figure 2 *	1	
A	FR 2 714 578 A (BRAMBILLA FAUSTO) 7 July 1995 * figure *	1	
			TECHNICAL FIELDS SEARCHED (Int.Cl.6)
			A43B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	16 December 1997	Scholvinck, T

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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