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(54) **AN ASSEMBLY FOR CONNECTING A BOOT TO A SKI, AND AN ADAPTER TO BE USED IN SAID ASSEMBLY**

ANORDNUNG ZUR VERBINDUNG EINES SKISCHUHS MIT EINEM SKI UND ADAPTER FÜR DIESE MONTAGE

ASSEMBLAGE PERMETTANT DE RELIER UNE BOTTE À UN SKI ET ADAPTATEUR DEVANT ÊTRE UTILISÉ DANS LEDIT ASSEMBLAGE

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## Description

**[0001]** The present invention relates to an assembly for connecting a boot to a ski, and more specifically it relates an assembly as disclosed in the preamble of claim 1. The invention further relates to an adapter for use in the assembly, as disclosed in the preamble of claim 14.

**[0002]** Different skiers have different individual preferences as regards the positioning of the binding in relation to the ski, and thus the positioning of the skier's boot and foot during skiing. Such preferences may relate to the height of the skier's boot above ground level, for example, in order to avoid the boot coming into contact with the ground during skating or when turning. Further preferences may be the heel-toe angle where the skier's heel and toe lie at different vertical levels, or the edging angle where the external and the internal long side of the binding lie at different vertical levels.

**[0003]** A spacer for use between a cross-country binding and a ski is previously known from EP 2108413 A1, where the cross-country binding is attached to the ski via bolts or screws passed through the ski binding and the spacer. The spacer in EP 2108413 A1 may have a heel-toe angle as can be seen, inter alia, from Fig. 1.

**[0004]** From WO 2005/113081 A1, which belongs to the Applicant, there is previously known a system for mounting a cross-country or telemark binding directly to a ski without the use of screws or the like, the mounting plate being glued to the ski, where the binding is slide-guided and snapped into place at the desired position on the mounting plate, and where the binding can later easily be removed or adjusted to a different desired position by means of the same slide-guiding and snap-locking principle. The system described in WO 2005/113081 A1 is known as the NIS system, where NIS stands for Nordic Integrated System.

**[0005]** A problem with the system described in EP 2108413 A1 is that it is very fiddly to remove the spacer, to adjust the position of the spacer and thus the position of the binding on the ski, or to replace the spacer with another spacer with different user properties/configuration. Drilling new holes for a new position on the ski might also impair the strength of the ski and the use properties of the ski might be altered.

**[0006]** Document US 6565110 B discloses an assembly according to the preamble of claim 1.

**[0007]** The present invention seeks to remedy the aforementioned or other disadvantages or drawbacks by means of an assembly having the features disclosed in claim 1.

**[0008]** An object of the invention is thus to provide an assembly including a binding, an adapter/spacer and a ski, where the user can easily switch between different adapters or use the binding and the ski without the use of an adapter.

**[0009]** Advantageous embodiments of the invention are set forth in the dependent claims.

**[0010]** In the following description, non-limiting embodiments of the invention are described with reference to the appended drawings, wherein

Figs. 1a and 1b are two perspective views, obliquely from above and obliquely from below respectively, of a first embodiment of the assembly according to the invention, with two planar adapters for the binding and heel piece respectively; and

Figs. 2a and 2b are two perspective views, obliquely from above and obliquely from below respectively, of a second embodiment according to the invention, with one wedge-shaped adapter for the binding.

**[0011]** With reference to the figures, an assembly 1 is shown for connecting a boot to a ski 2, including a binding 3 arranged to be connected to the boot, and a section 4 of the top surface 5 of the ski 2 arranged to be connected to an essentially plate-like adapter 6 between the binding 3 and the section 4, the adapter 6 being arranged to increase the distance between at least a part of the underside 7 of the binding 3 and the top surface 5 of the ski 2.

**[0012]** A first locking device 9 is arranged on the underside 7 of the binding 3 for locking the binding 3 to the adapter 6 via a corresponding second locking device 10 on the top side 11 of the adapter 6. Furthermore, a third locking device 13 is arranged on the underside 12 of the adapter 6 for locking the adapter 6 to the section 4 via a corresponding fourth locking device 14. The first locking device 9 on the binding 3 corresponds in addition to the fourth locking device 14 on the section 4 in order to permit direct connection of the binding 3 to the ski 2 without the use of the adapter 6.

**[0013]** The locking devices 9, 10, 13, 14 advantageously include corresponding sliding grooves and locking catches for slide-guiding to a fastening position via said sliding groove, whereafter locking in the sliding direction takes place by snap engagement via said locking catches.

**[0014]** The fastening position between the adapter 6 and the section 4 is advantageously adjustable in the longitudinal direction of the ski 2, a plurality of locking notches being provided along the length of the section 4 for locking in a corresponding number of fastening positions. However, the fastening position between the binding 3 and the adapter 6 is advantageously fixed and cannot be adjusted.

**[0015]** In the embodiment shown in Fig. 1, the assembly 1 advantageously includes a separate adapter 15 for connection between the section 4 and a separately arranged heel piece 16 of the binding 3, the adapter 6 having an essentially identical thickness along its longitudinal direction.

**[0016]** In the embodiment shown in Figs. 2a and 2b, the adapter 6 advantageously has a steadily diminishing thickness or wedge shape along its longitudinal direction (toe-heel angle), and diminishing from a forward part of the adapter 6 which corresponds to a forward part of the

binding 3, the wedge shape allowing connection of the separately arranged heel piece 16 of the binding directly on the section 4 without the use of adapter 15.

**[0017]** On the underside 12 of the adapter 6 there is advantageously provided at least one weakened portion 17, 18 extending transverse to the longitudinal direction of the adapter 6 to facilitate the bending motion of the ski 2 in its longitudinal direction.

**[0018]** On each side of the long side of the adapter 6 there is advantageously arranged an edge 19 extending in the longitudinal direction which projects sideways beyond the width of the section 4, a longitudinal groove being provided in the edge 19 for sliding accommodation of a corresponding longitudinal edge 20 on each of the respective sides of the section 4.

**[0019]** Weight-saving cut-outs are advantageously provided in the adapter 6, where X-shaped reinforcing ribs 21 are arranged in the cut-outs. Furthermore, the adapter 6 is advantageously made of plastic.

**[0020]** The section 4 is advantageously integrally configured with the ski 2, for example, glued to the top surface of the ski, and of the NIS type as described in WO 2005/113081 A1, belonging to the Applicant, where the different fastening and engaging surfaces between the binding 3 and the section 4 are described in detail.

**[0021]** To release the locking of the catches, there is advantageously provided a suitable, separate (non-illustrated) tool with an end for insertion into a depression or a hole 22 arranged in a top surface of each respective locking catch, the locking catch being flipped up from its locking engagement by tilting the tool. Alternatively, an ordinary, suitable screwdriver with a flat head can be used.

**[0022]** The present invention is not limited to the embodiments illustrated and described here, but can be varied within the scope of the attached claims.

## Claims

1. An assembly (1) for connecting a boot to a ski (2), including a binding (3) arranged to be connected to the boot, and a section (4) of the top surface (5) of the ski (2) arranged to be connected to an essentially plate-like adapter (6) between the binding (3) and the section (4), the adapter (6) being arranged to increase the distance between at least a part of the underside (7) of the binding (3) and the top surface (5) of the ski (2), comprising:

   a first locking device (9) arranged on the underside (7) of the binding (3) for locking the binding (3) to the adapter (6) via a corresponding second locking device (10) on the top side (11) of the adapter (6);
   a third locking device (13) arranged on the underside (12) of the adapter (6) for locking the adapter (6) to the section (4) via a corresponding fourth locking device (14),
   the first locking device (9) on the binding (3) corresponding in addition to the fourth locking device (14) on the section (4) in order to permit direct connection of the binding (3) to the ski (2) without the use of the adapter (6),
   **characterised in that** the adapter (6) includes corresponding sliding grooves and locking catches for slide-guiding to a fastening position via said sliding grooves, in order to permit locking in the sliding direction by means of snap engagement via said locking catches.

2. An assembly according to claim 1, **characterised in that** the fastening position between the adapter (6) and the section (4) is adjustable in the longitudinal direction of the ski (2), a plurality of locking notches being provided along the length of the section (4) for locking in a corresponding number of fastening positions.

3. An assembly according to claim 2, **characterised in that** the fastening position between the binding (3) and the adapter (6) is fixed and cannot be adjusted.

4. An assembly according to any one of the preceding claims, **characterised by** including a separate adapter (15) for connection between the section (4) and a separately arranged heel piece (16) of the binding (3), the adapter (6) having an essentially identical thickness along its longitudinal direction.

5. An assembly according to any one of the claims 1 to 4, **characterised in that** the adapter (6) has a steadily diminishing thickness or wedge shape along its longitudinal direction, and diminishing from a forward part of the adapter (6) which corresponds to a forward part of the binding (3), the wedge shape allowing connection of the separately arranged heel piece (16) of the binding directly on the section (4) without the use of adapter (15).

6. An assembly according to any one of the preceding claims, **characterised in that** on the underside (12) of the adapter (6) there is provided at least one weakened portion (17, 18) extending transverse to the longitudinal direction of the adapter (6) to facilitate the bending motion of the ski (2) in its longitudinal direction.

7. An assembly according to any one of the preceding claims, **characterised in that** on each side of the long side of the adapter (6) there is arranged an edge (19) extending in the longitudinal direction which projects sideways beyond the width of the section (4), a longitudinal groove being provided in the edge (19) for sliding accommodation of a corresponding longitudinal edge (20) on each of the respective

sides of the section (4).

**8.** An assembly according to any one of the preceding claims, **characterised in that** a number of weight-saving cut-outs are provided in the adapter (6), and where X-shaped reinforcing ribs (21) are arranged in the cut-outs.

**9.** An assembly according to any one of the preceding claims, **characterised in that** the adapter (6) is made of plastic.

**10.** An assembly according to any one of the preceding claims, **characterised in that** the section (4) is of plastic and is integrally configured with the top surface (5) of the ski (2).

**Patentansprüche**

**1.** Anordnung (1) zur Verbindung eines Schuhs mit einem Ski (2), aufweisend eine Bindung (3), die angeordnet ist, um mit dem Schuh verbunden zu werden, und einen Abschnitt (4) der Oberseite (5) des Skis (2), der angeordnet ist, um mit einem im Wesentlichen plattenartigen Adapter (6) zwischen der Bindung (3) und dem Abschnitt (4) verbunden zu werden, wobei der Adapter (6) dazu angeordnet ist, den Abstand zwischen zumindest einem Teil der Unterseite (7) der Bindung (3) und der Oberseite (5) des Skis (2) zu erhöhen, umfassend:

eine erste Rastvorrichtung (9), die an der Unterseite (7) der Bindung (3) angeordnet ist, um die Bindung (3) über eine korrespondierende zweite Rastvorrichtung (10) an der Oberseite (11) des Adapters (6) am Adapter (6) zu verrasten;
eine dritte Rastvorrichtung (13), die an der Unterseite (12) des Adapters (6) angeordnet ist, um den Adapter (6) über eine korrespondierende vierte Rastvorrichtung (14) am Abschnitt (4) zu verrasten;
wobei die erste Rastvorrichtung (9) an der Bindung (3) zudem auch mit der vierten Rastvorrichtung (14) am Abschnitt (4) korrespondiert, um eine direkte Verbindung der Bindung (3) mit dem Ski (2) ohne Verwendung des Adapters (6) zu ermöglichen,
**dadurch gekennzeichnet, dass** der Adapter (6) korrespondierende Gleitrillen und Rastnasen zum gleitenden Führen über die Gleitrillen zu einer Befestigungsposition aufweist, um ein Verrasten in Gleitrichtung durch einen Schnappeingriff über die Rastnasen zu ermöglichen.

**2.** Anordnung nach Anspruch 1, **dadurch gekennzeichnet, dass** die Befestigungsposition zwischen dem Adapter (6) und dem Abschnitt (4) in der Längsrichtung des Skis (2) einstellbar ist, wobei entlang der Länge des Abschnitts (4) eine Mehrzahl an Rastnasen zur Verrastung an einer entsprechenden Anzahl an Befestigungspositionen vorgesehen sind.

**3.** Anordnung nach Anspruch 2, **dadurch gekennzeichnet, dass** die Befestigungsposition zwischen der Bindung (3) und dem Adapter (6) fest ist und nicht eingestellt werden kann.

**4.** Anordnung nach einem der vorhergehenden Ansprüche, **gekennzeichnet durch** das Aufweisen eines separaten Adapters (15) für die Verbindung zwischen dem Abschnitt (4) und einem separat angeordneten Fersenteil (16) der Bindung (3), wobei der Adapter (6) entlang seiner Längsrichtung eine im Wesentlichen gleiche Dicke aufweist.

**5.** Anordnung nach einem der Ansprüche 1 bis 4, **dadurch gekennzeichnet, dass** der Adapter (6) in seiner Längsrichtung eine stetig abnehmende Dicke oder Keilform aufweist, wobei die Keilform durch die von einem vorderen Teil des Adapters (6), der einem vorderen Teil der Bindung (3) entspricht, ausgehende Abnahme eine direkte Verbindung des separat angeordneten Fersenteils (16) der Bindung mit dem Abschnitt (4) ohne Verwendung des Adapters (15) erlaubt.

**6.** Anordnung nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** an der Unterseite (12) des Adapters (6) zumindest ein geschwächter Bereich (17, 18) vorgesehen ist, der quer zur Längsrichtung des Adapters (6) verläuft, um die Biegebewegung des Skis (2) in dessen Längsrichtung zu erleichtern.

**7.** Anordnung nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** an jeder Seite entlang der langen Seite des Adapters (6) eine in Längsrichtung verlaufende Kante (19) angeordnet ist, die seitlich über die Breite des Abschnitts (4) hinausragt, wobei in der Kante (19) eine Längsrille zur gleitenden Aufnahme einer korrespondierenden Längskante (20) an jeder der jeweiligen Seiten des Abschnitts (4) vorgesehen ist.

**8.** Anordnung nach einem der vorgehenden Ansprüche, **dadurch gekennzeichnet, dass** mehrere gewichtseinsparende Aussparungen im Adapter (6) vorgesehen sind, und wobei X-förmige Verstärkungsrippen (21) in den Aussparungen angeordnet sind.

**9.** Anordnung nach einem der vorgehenden Ansprüche, **dadurch gekennzeichnet, dass** der Adapter (6) aus Kunststoff hergestellt ist.

**10.** Anordnung nach einem der vorgehenden Ansprüche, **dadurch gekennzeichnet, dass** der Abschnitt (4) aus Kunststoff ist und einstückig mit der Oberseite (5) des Skis (2) ausgelegt ist.

**Revendications**

**1.** Assemblage (1) permettant de relier une botte à un ski (2), comprenant une attache (3) agencée pour être reliée à la botte et une section (4) de la surface supérieure (5) du ski (2) agencée pour être reliée à un adaptateur essentiellement en forme de plaque (6) entre l'attache (3) et la section (4), l'adaptateur (6) étant agencé pour augmenter la distance entre au moins une partie du côté inférieur (7) de l'attache (3) et la surface supérieure (5) du ski (2), comprenant :

un premier dispositif de verrouillage (9) agencé sur le côté inférieur (7) de l'attache (3) afin de verrouiller l'attache (3) à l'adaptateur (6) par le biais d'un deuxième dispositif de verrouillage (10) correspondant sur le côté supérieur (11) de l'adaptateur (6) ;
un troisième dispositif de verrouillage (13) agencé sur le côté inférieur (12) de l'attache (6) afin de verrouiller l'adaptateur (4) à la section (4) par le biais d'un quatrième dispositif de verrouillage (14) correspondant,
le troisième dispositif de verrouillage (9) sur l'attache (3) correspondant en plus au quatrième dispositif de verrouillage (14) sur la section (4) afin de permettre une liaison directe de l'attache (3) avec le ski (2) sans l'utilisation de l'adaptateur (6),
**caractérisé en ce que** l'adaptateur (6) inclut des rainures de coulissement et des cliquets de verrouillage correspondants afin d'effectuer un guidage par coulissement vers une position de fixation par le biais desdites rainures de coulissement, afin de permettre le verrouillage dans la direction de coulissement au moyen d'une mise en prise par encliquetage par le biais desdits cliquets de verrouillage.

**2.** Assemblage selon la revendication 1, **caractérisé en ce que** la position de fixation entre l'adaptateur (6) et la section (4) est réglable dans la direction longitudinale du ski (2), une pluralité d'encoches de verrouillage étant prévue sur la longueur de la section (4) pour un verrouillage dans un nombre correspondant de positions de fixation.

**3.** Assemblage selon la revendication 2, **caractérisé en ce que** la position de fixation entre l'attache (3) et l'adaptateur (6) est fixe et ne peut pas être réglée.

**4.** Assemblage selon l'une quelconque des revendications précédentes, **caractérisé en ce qu'**il contient un adaptateur séparé (15) permettant de relier la section (4) et une pièce de talon (16) agencée séparément de l'attache (3), l'adaptateur (6) ayant une épaisseur essentiellement identique le long de sa direction longitudinale.

**5.** Assemblage selon l'une quelconque des revendications 1 à 4, **caractérisé en ce que** l'adaptateur (6) présente une forme biseautée ou d'épaisseur diminuant progressivement le long de sa direction longitudinale et diminuant depuis une partie avant de l'adaptateur (6) qui correspond à une partie avant de l'attache (3), la forme biseautée permettant de relier la pièce de talon (16) agencée séparément de l'attache directement sur la section (4) sans l'utilisation de l'adaptateur (15).

**6.** Assemblage selon l'une quelconque des revendications précédentes, **caractérisé en ce que**, sur le côté inférieur (12) de l'adaptateur (6), se trouve au moins une partie affaiblie (17, 18) s'étendant transversalement à la direction longitudinale de l'adaptateur (6) afin de faciliter le mouvement de flexion du ski (2) dans sa direction longitudinale.

**7.** Assemblage selon l'une quelconque des revendications précédentes, **caractérisé en ce que**, de chaque côté du côté long de l'adaptateur (6), se trouve un bord (19) s'étendant dans la direction longitudinale, qui fait saillie vers le côté au-delà de la largeur de la section (4), une rainure longitudinale étant prévue dans le bord (19) pour recevoir par coulissement un bord longitudinal (20) correspondant sur chacun des côtés respectifs de la section (4).

**8.** Assemblage selon l'une quelconque des revendications précédentes, **caractérisé en ce qu'**un certain nombre de découpes permettant d'alléger le poids est prévu dans l'adaptateur (6) et dans lequel des nervures de renfort en forme de X (21) sont agencées dans les découpes.

**9.** Assemblage selon l'une quelconque des revendications précédentes, **caractérisé en ce que** l'adaptateur (6) est composé de plastique.

**10.** Assemblage selon l'une quelconque des revendications précédentes, **caractérisé en ce que** la section (4) est en plastique et est conçue d'un seul tenant avec la surface supérieure (5) du ski (2).

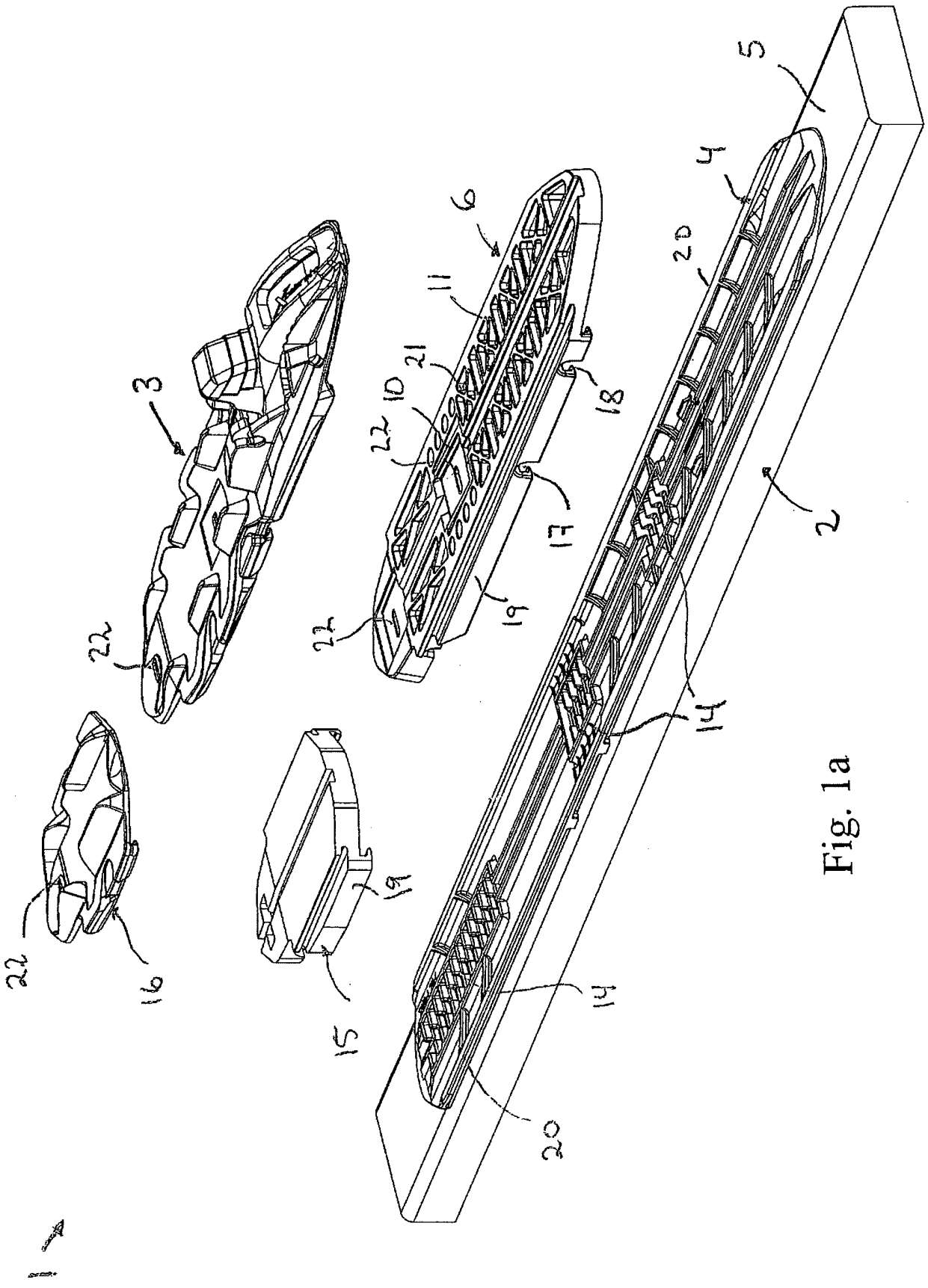


Fig. 1a

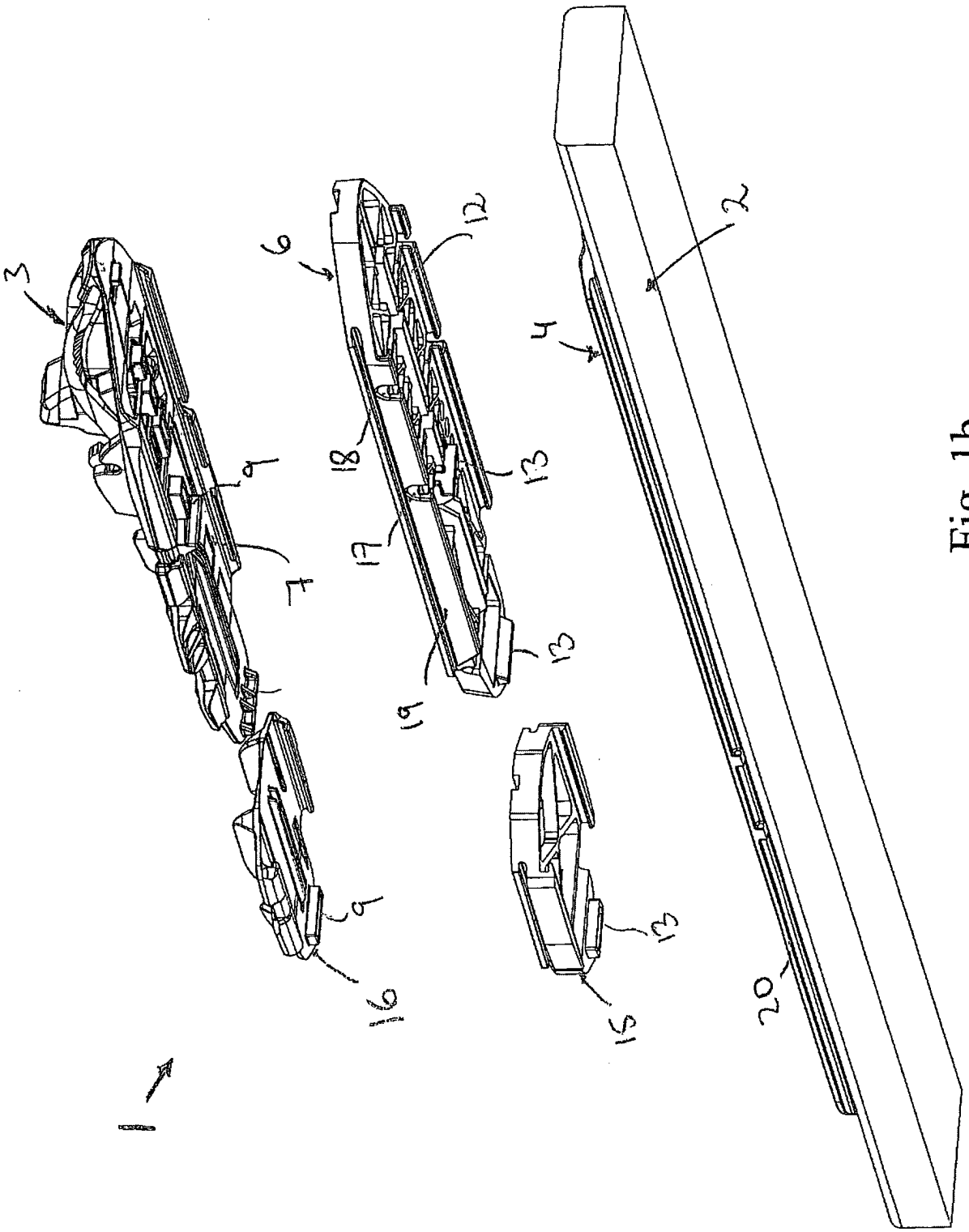


Fig. 1b

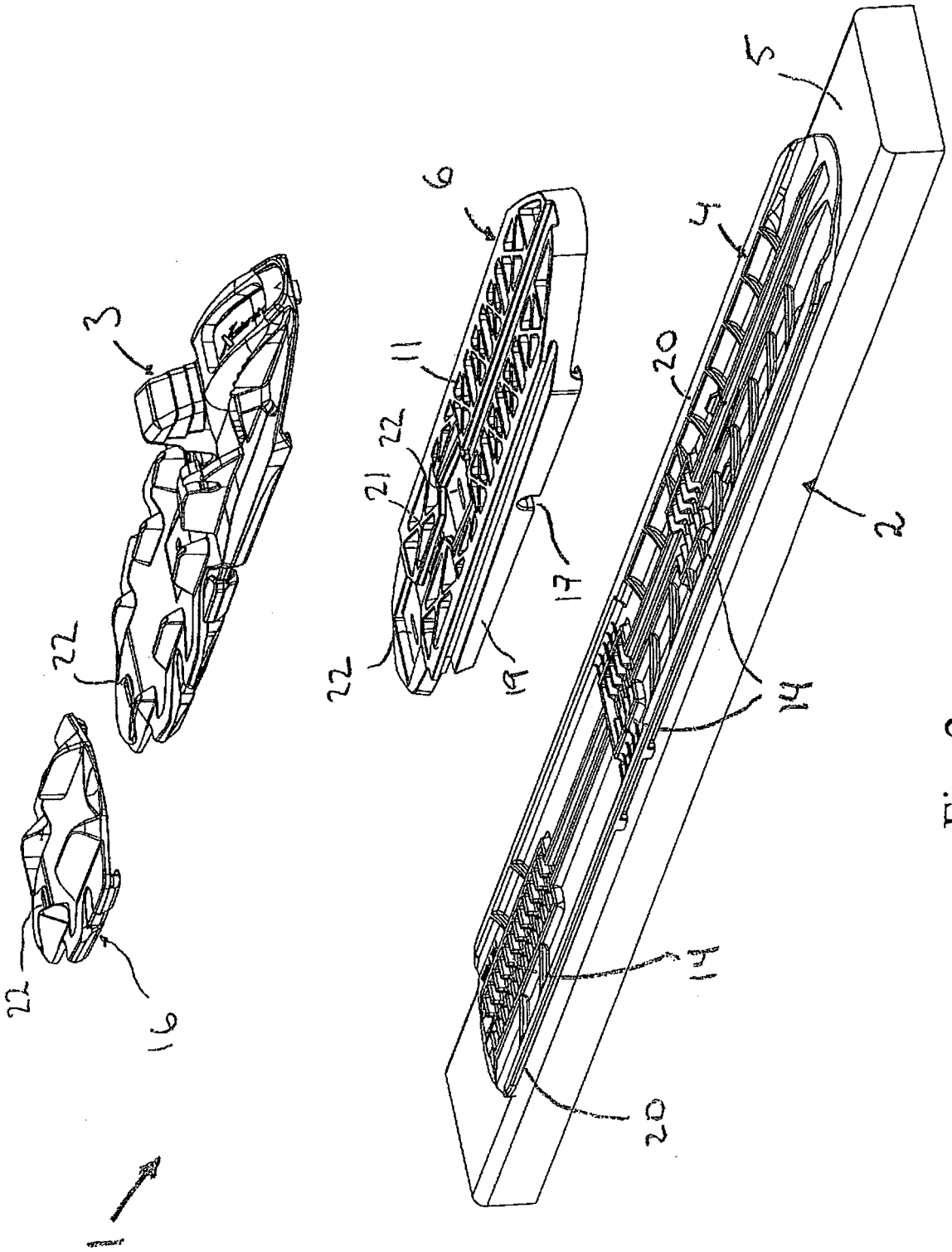


Fig. 2a

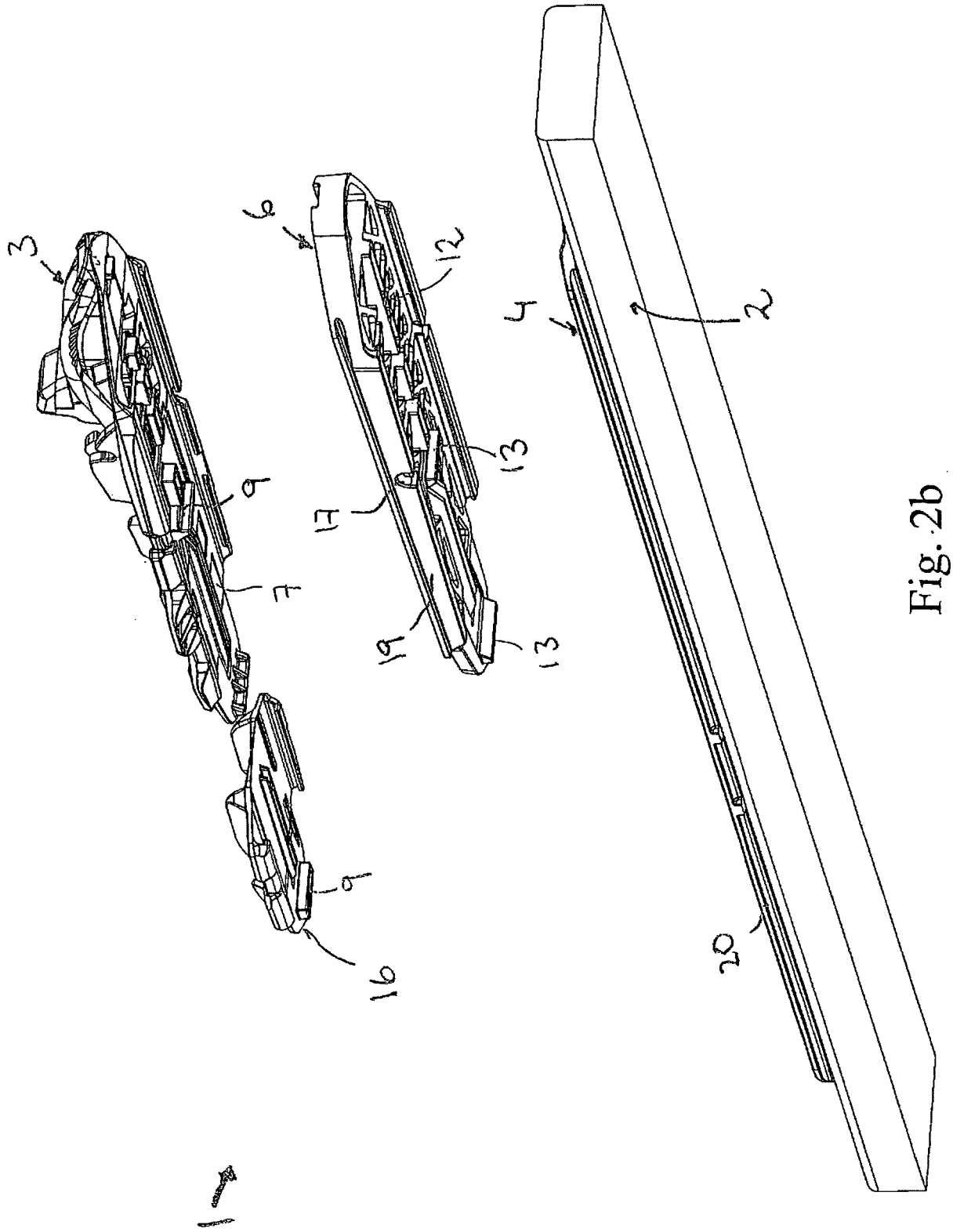


Fig. 2b

## REFERENCES CITED IN THE DESCRIPTION

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- US 6565110 B **[0006]**