Title: DEVICE AT A STICK FOR FLOOR BALL HOCKEY

Abstract: The invention relates to an arrangement for a floorball stick comprising a shaft capable of being attached to a blade. According to the invention, the attachment between the shaft (4) and the blade (3) consists of an insert piece (6) which is pivotally (9, 10) accommodated. A locking device (5, 5', 5") is so arranged as to interact between the blade (3) and the aforementioned insert part (6). The locking device (5, 5', 5") consists of a number of locking bodies that are capable of being introduced from one side of the blade of the stick through a number of recessed openings in the blade (3) of the stick to an internally channel-shaped accommodating space. In this way the shaft (4) is capable of being adjusted and locked at a desired angle in relation to the blade (3).
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For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.
Device at a stick for floor ball hockey

The present invention relates to an arrangement for a floorball stick comprising a shaft capable of being attached to a blade.

Previous solutions for the attachment of the shaft to a separately produced stick blade for a floorball stick can be found in, for example, Swedish design registration application No. 91-0708, SE 503 158 C2 and SE 504 631 C2. However, none of the aforementioned solutions permits variation of the angle between the stick shaft and the stick blade, and the shaft is so arranged as to be capable of accommodating a dowel-shaped projecting stick attachment part located at the rear, or else the lower end part of the shaft is accommodated in a sleeve-shaped rear shaft accommodating part located at the rear. The aforementioned attachments are permanent, and the angle between the shaft of the stick and the blade of the stick is determined by the manufacturer once and for all, although the angle can vary from stick to stick between different makes of stick. For example, the obtuse angle between a level base and the shaft of a stick can be as much as ca. 140°.

Different floorball players wish to play with sticks in which the angle differs to a greater or less degree from the angle with which sticks are currently manufactured. For example, it is desirable for a forward who wishes to dribble easily to have a stick in which the angle is smaller than in a stick that is more suitable for shooting heavy back shots where the angle is larger. The appropriate angle can also depend on the height of the player, and the player can then hold the stick in a more comfortable position, for example without having to bend down or stretch up to play on his toes in order to be able to use the stick correctly.
US 2,155,830 A relates to a golf club in which a nut (24) is forced against another nut (23), which in turn presses against a flattened part (17) in a shaft swivel part (13), and which is assembled in such a way as to pivot about a bolt (22), the head of which is accommodated in such a way as to be capable of displacement in a slot (21) in the head (10) of the golf club.

The aforementioned golf club does not contain any locking devices, however, as in the case of the present arrangement for a floorball stick, which comprises a number of separate locking bodies that are capable of being introduced in a direction from one side of the blade of the stick for accommodation in an internally channel-shaped accommodating space therein.

The principal object of the present invention is thus, in the first instance, to solve the aforementioned problem by simple means and to permit a stick to be adjusted directly to the correct angle without being required to perform serious operations which spoil the stick or place its safety at risk.

The aforementioned object is achieved by means of an arrangement in accordance with the present invention, which is characterized essentially in that the attachment between the shaft and the blade consists of an insert part that is accommodated in such a way as to be capable of pivoting, in that a locking device is so arranged as to interact between the blade and the aforementioned insert part, and in that the locking device consists of a number of locking bodies that are capable of being introduced from one side of the blade of the stick through a number of recessed openings in the blade of the stick to an internally channel-shaped accommodating space, by means of which the shaft is capable of being adjusted and locked at a desired angle in relation to the blade.
The shaft of the floorball stick can be adjusted in this way and locked at a desired angle in relation to the blade, viewed with the stick held in a position ready to play against a playing surface and along a vertical plane. The insert part is then caused to pivot into the desired set angular position, in which the blade of the stick is retained in relation to the shaft with the help of one or two locking bodies which are accommodated for this purpose in an accommodating space in the blade.

The angle can thus be varied simply by selecting the locking device that includes the locking body or locking bodies in question which give the desired angle at which it is wished to set the blade in relation to the shaft in order to suit the player’s height and playing position and technique.

The invention is described below as a preferred illustrative embodiment, in conjunction with which reference is made to the accompanying drawings, in which;

Fig. 1 shows a perspective view of the blade of a floorball stick attached to a shaft with an arrangement in accordance with the present invention;

Fig. 2 shows a side view of a floorball stick illustrating the possibilities for angular adjustment;

Fig. 3 shows an exploded view of the arrangement in accordance with the invention for a blade and a shaft;

Fig. 4 shows the arrangement and the blade alone;

Fig. 5 shows the lower part of a stick viewed directly from the front with different conceivable sections at the connection between the blade and the shaft of the stick marked with arrows;

Fig. 6 shows a sectioned view along the line VI-VI in Fig. 5;

Fig. 7 shows a sectioned view along the line VII-VII in Fig. 5;
Fig. 8 shows a sectioned view along the line VII-VIII in Fig. 5;

Fig. 9 shows the shaft attachment part of a stick with the shaft inserted in a blade without any securing means and viewed from the front side of the blade; and

Fig. 10 shows the opposite side of the blade.

An arrangement 1 for a floorball stick 2, which comprises a shaft 4 capable of being attached to a blade 3, with the blade 3 shaped in such a way as to be particularly suitable for use by players who normally play from the left or right, comprises locking devices 5 to lock the blade 3 and the shaft 4 securely to one another in the desired set angular position 0, I, II.

In this way the attachment 6 between the shaft 4 and the blade 3 consists of an insert piece, which is pivotally 9, 10 accommodated with its part 8 that is capable of introduction into the blade 3 in the upper rear attachment sleeve 7 of the blade of the stick. A locking device 5, 5Ⅰ, 5Ⅱ is thus so arranged in accordance with the invention as to interact between the blade 3 and the aforementioned insert part 6, whereby the shaft 4 is capable of being adjusted and locked at a desired angle X in relation to the blade 3 preferably between a specific number of different angles.

The aforementioned insert part is preferably in the form of a separate detachable pin 6, which, with a rear insert part 12, is accommodated in the lower cavity 13 of the shaft and exhibits a front insert section 8, which has a front connecting part 15, the shape of which is congruently adapted to an accommodating space 11 in the inner shaft connection part 14 inside the blade 3 of the stick.

The aforementioned shape-adapted connecting part 15 and accommodating space 11 exhibit out-of-round form, essentially square, and preferably rectangular, so that the correct position for the insert section 8 of the aforementioned insert part in the accommodating space 11 can
be achieved simply if it is only capable of being inserted in a single correct position.

The connecting part 15, which preferably tapers in a conical fashion in a direction towards its lower free end 15A, also exhibits two connecting surfaces 16, 17 facing away from one another. Both of the aforementioned connecting surfaces 16, 17 are attached to one another by means of lateral surfaces 18 extending between them and facing in a direction away from one another.

An annular flange 19 is present on the insert part 6 above the aforementioned connection surfaces 16, 17 and is in contact, at least in a certain position, with a shoulder 20 in the internal cavity 21 of the attachment sleeve 7 when the aforementioned insert part 6 is pivoted relative to the blade 3 of the stick in the desired direction 9, 10 viewed in the longitudinal direction 22 of the blade of the stick.

A locking device 5, 5I, 5II is thus so arranged as to retain the insert part 6 in the desired adjustment position 0, I, II, so that the angle between the blade 3 and the shaft 4 is not changed.

The aforementioned locking device 5, 5I, 5II consists of a number of locking bodies 23, 24; 25; 26, which are capable of being introduced from one side 3A or 3B of the blade of the stick, depending on whether the blade 3 is arranged for left-handed or right-handed shooting with appropriate dishing for that purpose, through a number of recessed openings 27, 28 in the blade 3 of the stick and into its aforementioned internal accommodating space 11 for that purpose. The locking body 5, 5I, 5II in question exhibits a tapered insert part 33, 34; 35; 36 matching and covering the space 29, 30 between the insert part 6 and the respective counter-pressure part 31, 32 in the accommodating space 11, which insert part appropriately tapers in a direction away from its one side edge 37 towards its opposing side edge 38.

A transverse cover part 43, 44, 45 projects on the opposite
side of the respective front bottom edge 39, 40; 41, 42 of the locking body.

In accordance with two illustrative examples of locking bodies $5^I$, $5^{II}$, which are mirror images of one another, only a single wedge-shaped insert part 35, 36 is present on the aforementioned locking body $5^I$, $5^{II}$.

In accordance with an illustrative embodiment of the locking body 5, two wedge-shaped insert parts 34, 34 projecting at a mutual distance 2 from one another in a common direction 46 are present on the aforementioned locking body 5. A transverse cover part 43 bridging both the aforementioned insert parts 34, 34 extends from the rear end parts 47, 48 of the aforementioned respective insert parts.

A bridging part 70 is also present in the middle of a transverse recess 71, which comprises both the aforementioned smaller recessed openings 27, 28 in the blade 3, which aforementioned part 70 extends in the longitudinal direction of an accommodating channel 11 at the rear shaft attachment part 15 of the blade. The aforementioned part 70 is wedge-shaped, whereby a recessed opening 27, 28 on either side of the aforementioned bridging part 70 thus also exhibits the shape of a wedge.

Secure locking of the aforementioned insert part 6 to the blade 3 is achieved by means of a transverse screw 49, which extends through an opening 50 in the blade and an opening 51 in the insert part 6. The screw 49 can also extend through the shaft 4 if this is pushed in to such an extent that it reaches as far as the screw 49.

The blade 3 and the aforementioned insert part 8 can be pivoted relative to one another about the aforementioned screw 49 or some other connection forming a pivot axle.

The blade 3 and the shaft 4 are held securely to one another by means of a transcurrent screw 52, which extends through a hole 53 in the blade 3 along its
longitudinal median plane 54 and in through a hole 55 in the insert part 6 and then onwards into the material in the blade 3 or onwards through the same before being attached to a nut, a further screw or the plastic material of the blade 3 on the opposite side of the aforementioned accommodating space 11 in the blade 3.

The tubular shaft 4 is attached to the aforementioned insert part 6 with a little adhesive, for example, and projections 56 on the insert part 6 are accommodated in matching slots 57 in the shaft 4 to prevent the shaft 4 from turning easily. The aforementioned shaft insert part 6 and the shaft 4 are formed from separate parts.

To enable the locking device to be released, a number of recesses 58, which extend through the blade into the internal space 11 of the blade, are present on the side opposite the aforementioned area in the blade 3, and a suitable projecting ejection tool is arranged in the aforementioned recesses 58 in such a way as to be pushed in to enable the respective locking device 5, 5I, 5II to be removed.

A set 60 of locking devices 5, 5I, 5II can appropriately be provided, including a locking device 5, which exhibits pairs of locking bodies 23, 24 on a common part and at least two additional locking devices 5I; 5II each of which has its own mutually inverted locking bodies 25, 26.

The function of the invention should by now have been clearly appreciated from the above description, and with reference to Fig. 2 it is shown how, if you wish to obtain the angle X so that the shaft 4 is inclined in relation to the blade 3 at a smaller angle, i.e. the shaft extends upwards in a more straight line, the locking device 5I located at the front is placed in a matching recess 27 in the blade 3 so that the wedge-shaped locking body 25 of the aforementioned locking device 5I is wedged securely between one lower connecting surface 16 of the insert part 6 and the
respective counter-pressure part 31 of the accommodating space 11. By means of the screw 52 the aforementioned locking device $5^I$ is then locked in a retaining position, for example as shown in Fig. 7. The fixing screw 52 is then accommodated by the respective locking device 5, $5^I$, $5^{II}$ in transcurrent holes 59 arranged on its wedge-shaped insert part 33-35 and matching the aforementioned screw 52.

An arrangement 1 in accordance with the present invention thus permits the angle $X$ between the shaft 4 and the blade 3 of a floorball stick to be adjusted with the help of wedge-shaped locking bodies 5, $5^I$, $5^{II}$, which can be included in an aforementioned set 60 with an appropriate number of constituent locking bodies. In this way a locking body 5 can be so arranged as to set the blade 3 in a neutral position 0; see Figs. 2 and 6. Another locking body $5^I$ can be so arranged as to set the shaft 4 at a smaller angle to permit playing closer to the user’s body without changing the angle of the shaft to the floor 61; see Figs. 2 and 7.

Another locking body $5^{II}$ can be so arranged as to set the shaft 4 at a larger angle to the floor 61 to permit playing further from the user’s body; see Figs. 2 and 8.

The invention is not restricted to the illustrative embodiment illustrated and described above, but may be varied within the scope of the Patent Claims without departing from the idea of invention.
Patent Claims

1. Arrangement (1) for a floorball stick (2) comprising a shaft (4) capable of being attached to a blade (3), characterized in that the attachment between the shaft (4) and the blade (3) consists of an insert part (6) that is accommodated in such a way as to pivot (9, 10), in that a locking device (5, 5¹, 5¹¹) is so arranged as to interact between the blade (3) and the aforementioned insert part (6), and in that the locking device (5, 5¹, 5¹¹) consists of a number of locking bodies (23, 24; 25; 26) that are capable of being introduced from one side (3A) of the blade of the stick through a number of recessed openings (27, 28) in the blade (3) of the stick to an internally channel-shaped accommodating space (11), by means of which the shaft (4) is capable of being adjusted and locked at a desired angle (X) in relation to the blade (3).

2. Arrangement in accordance with Patent Claim 1, characterized in that the insert part is in the form of a separate detachable pin (6).

3. Arrangement in accordance with one or other of Patent Claims 1-2, characterized in that the insert part (6) exhibits a front insert section (8) with a front connecting part (15), the shape of which is congruently adapted to an accommodating space (11) in the shaft connection part (14) inside the blade (3) of the stick.

4. Arrangement in accordance with Patent Claim 3, characterized in that the connecting part (15) exhibits square form.

5. Arrangement in accordance with one or other of Patent Claims 3-4, characterized in that the connecting part (15) exhibits two connecting surfaces (16, 17) facing away
from one another and two lateral surfaces (18) extending between them and facing in a direction away from one another.

6. Arrangement in accordance with one or other of Patent Claims 4-5, characterized in that the connecting surfaces (16, 17) which face in a direction away from one another are wedge-shaped so that the insert part (8) tapers in a direction towards its front end (15A).

7. Arrangement in accordance with one or other of Patent Claims 3-5, characterized in that a locking device (5, 5', 5'') is so arranged as to retain the insert part (6) in the desired adjustment position (0, I, II).

8. Arrangement in accordance with one or other of the above Patent Claims, characterized in that the locking body (5, 5', 5'') in question exhibits a tapered insert part (33, 34; 35; 36) matching and covering the space (29, 30) between the insert part (6) and the respective counter-pressure part in the accommodating space (11).

9. Arrangement in accordance with Patent Claim 8, characterized in that the aforementioned wedge-shaped insert part (33-36) in the locking body (5, 5', 5'') tapers in a direction from its one side edge (37) towards its opposing side edge (38).

10. Arrangement in accordance with one or other of Patent Claims 8-9, characterized in that a transverse cover part (43-45) projects on the opposite side of the respective front bottom edge (39-42) of the locking body.

11. Arrangement in accordance with one or other of Patent Claims 9-10, characterized in that only a single wedge-shaped insert part is present on the aforementioned locking body (5', 5'').

12. Arrangement in accordance with one or other of Patent Claims 8-10, characterized in that two wedge-shaped insert parts (34, 34) projecting at a mutual distance (Z)
from one another in a common direction (46) are present on
the aforementioned locking body (5).
13. Arrangement in accordance with Patent Claim 12,
characterized in that a transverse cover part (43) bridging
both the aforementioned insert parts (34, 34) extends from
the rear end parts (47, 48) of the aforementioned respective
insert parts.
14. Arrangement in accordance with one or other of the
above Patent Claims, characterized in that a bridging part
(70) is also present in the middle of a transverse recess
(48) in the blade (3), and in that this part (70) extends in
the longitudinal direction of an accommodating channel (11)
at the rear shaft attachment part (15) of the blade.
15. Arrangement in accordance with Patent Claim 14,
characterized in that a recessed opening (27, 28) on either
side of the aforementioned bridging part (70) exhibits the
shape of a wedge.
16. Arrangement in accordance with one or other of the
above Patent Claims, characterized in that a screw (52) is so
arranged as to be capable of being accommodated in the blade
(3), along its longitudinal direction (22) in through the
shaft insert part (6) and the attachment sleeve (7) of the
shaft.
17. Arrangement in accordance with one or other of the
above Patent Claims, characterized in that the shaft insert
part (6) and the shaft (4) are formed from separate parts,
and in that a recess (57) and a projection (56) are present
therein to prevent them from rotating relative to one
another.
18. Arrangement in accordance with one or other of the
above Patent Claims, characterized in that there extend into
the aforementioned opposing internal space (11) in the blade
(3) a number of recesses (58), which are intended to
accommodate a projecting ejection tool for the aforementioned locking device (5, 5\textsuperscript{I}, 5\textsuperscript{II}).

19. Arrangement in accordance with one or other of the above Patent Claims, characterized in that a set (60) of locking devices (5, 5\textsuperscript{I}, 5\textsuperscript{II}) includes a locking device (5), which exhibits pairs of locking bodies (23, 24) on a common part, and at least two additional locking devices (5\textsuperscript{I}; 5\textsuperscript{II}), each of which has its own mutually inverted locking bodies (25, 26).
INTERNATIONAL SEARCH REPORT

A. CLASSIFICATION OF SUBJECT MATTER

IPC7: A63B 59/12
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC7: A63B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

SE, DK, FI, NO classes as above

Electronic database consulted during the international search (name of database and, where practicable, search terms used)

EPO-INTERNAL, WPI DATA, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

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Further documents are listed in the continuation of Box C. See patent family annex.

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# INTERNATIONAL SEARCH REPORT
## Information on patent family members

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