



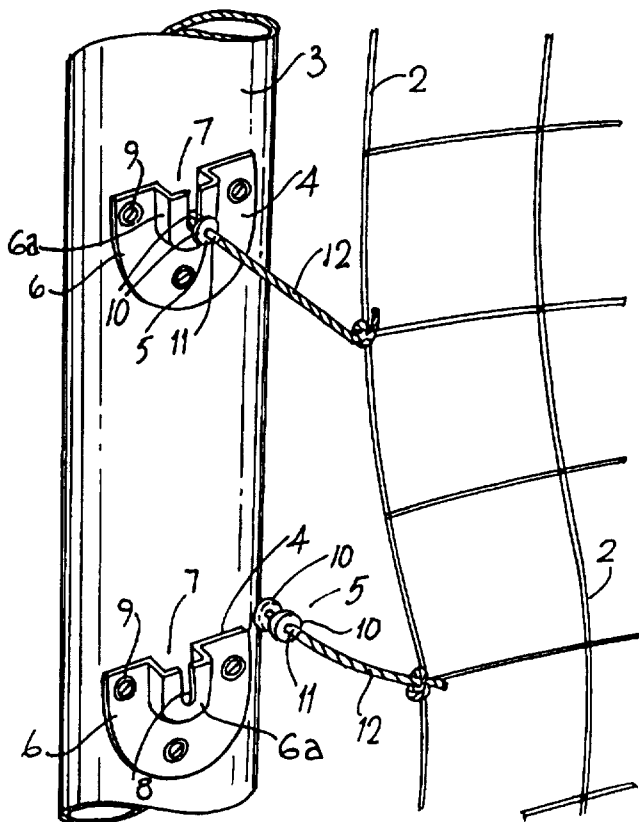
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<p>(21) International Application Number: PCT/IE97/00032</p> <p>(22) International Filing Date: 23 April 1997 (23.04.97)</p> <p>(30) Priority Data: S960310 23 April 1996 (23.04.96) IE</p> <p>(71)(72) Applicant and Inventor: DENNIS, John [IE/IE]; Post Office Road, Lusk, County Dublin (IE).</p> <p>(74) Agents: O'CONNOR, Donal, H. et al.; Cruickshank & Co., 1 Holles Street, Dublin 2 (IE).</p>		<p>(81) Designated States: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DE (Utility model), DK, DK (Utility model), EE, ES, FI, GB, GE, HU, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, TJ, TM, TR, TT, UA, UG, US, UZ, VN, ARIPO patent (GH, KE, LS, MW, SD, SZ, UG), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG).</p> <p>Published <i>With international search report. Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.</i></p>

(54) Title: A NET FIXING DEVICE

(57) Abstract

A net fixing device (1) for mounting a net (2) on a goalpost (3) comprises a female member (4) and an associated male member (5). The female member (4) is fastened to the goalpost (3) and the male member (5) is secured to the net (2) by a cord (12). A bulbous head of the male member (5) has a plate (10) for engagement within a socket (7) of the female member (4) to interengage the male and female members. Preferably a ball and socket joint is formed between the male and female members when they interengage. A plurality of the female members (4) are mounted apart around a rear face of the goalpost (3) and are engaged by complementary male members (5) to secure the net (2) of the goalpost (3).



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"A Net Fixing Device"

This invention relates to a connector and in particular to a net fixing device for goalposts and other structures used in games.

5 There are major safety problems with goalposts used in football, hurling, hockey, soccer and other ball games in that in many instances nets have been attached to the posts by the use of metal hooks or some other form of permanent fixtures. Injuries to players have been commonplace on coming into contact with such fixing
10 devices. Because of the increased emphasis on safety, the ruling authorities in many games have banned many of these fixing devices.

Various net fixing devices are known. For example, French Patent Application No. 2707507 discloses goalposts and a
15 cross-bar which are made from an aluminium section having a groove of predetermined depth which allows the introduction of an aluminium T-piece for fixing the netting on the posts and the bar with concealed hooks. Unfortunately such a device is extremely expensive to make
20 as, it requires extremely expensive posts and cross-members and generally is not very efficient in use.

United States Patent No. 5476266 discloses a net fastener device for securing a net to a soccer goal frame. Essentially a plurality of spaced-apart clips and hangers
25 are provided around an edge of the net, the clips and hangers being engagable in associated channels or tracks fixed along a rear face of the goal upright and the crossbar respectively.

European Patent Publication No. 502279 discloses another
30 construction of post which are made in light metal and

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5 oval in section provided with internal stiffening members. A central groove on one wall of the post holds a nut into which a threaded rod is put to secure a hook to fix the net to the hook. Unfortunately such a hook provides a hazard for the players. Other proposals, for example, have been the use of VELCRO (Registered Trade Mark) Straps as disclosed for example in PCT patent publication no. WO95/00214. Undoubtedly VELCRO Straps superficially appears to be a good way to provide such fixing since
10 VELCRO is easily removed and refitted. Unfortunately, as everybody is aware, nets are not stored in perfect conditions, nets get contaminated and dirty and the VELCRO quickly loses its effectiveness.

15 There is indeed a need to provide a more efficient way of fixing nets to goalposts which obviates the need of tapes, wire wraps, straps, cord, etc. It is vital that any such fixing device should not alone be easy to use, but should be easily removed, because if not they will be torn off by those taking the nets down at the end of a match.

20 Essentially what is required is a safe, simple, time-saving, durable and economic net fixture. Such a safe fixture must ensure that there are no sharp projections to catch clothing or body and that all external surfaces and edges are smooth. Secondly, it must be simple in that any
25 complicated attachments or complicated pieces of equipment of their nature are difficult to use. It must be time-saving in that the attachment and the removal of the net must be simple and easy. The devices must be durable because if not, they are of little use and they must be
30 both weatherproof and vandal-proof. Finally, the components of the particular device must be capable of mass production and be maintenance-free so that they can be cheaply and easily produced and will last sufficient time to make the purchase economic.

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According to the invention there is provided a net fixing device for goalposts and other structures used in games comprising a male member and a cooperating female member, one member for permanent fixing to the goalpost and the other for fixing to the net. Preferably, the female member is for fixing to the goalpost and the male member is for fixing to the net.

Such a device overcomes the major problems of all heretofore known net fixing devices in that what is provided are two easily cooperating pieces of equipment that can be engaged and disengaged relatively easily.

In a particularly preferred embodiment the male member and the female member are interengagable to form a ball and socket joint. This advantageously allows secure engagement of the male member and female member in use.

In one embodiment of the invention the female member comprises a base plate mounting a body member incorporating a socket, having an open elongated slot in the body member projecting inwardly of a mouth of the socket and in which the male member comprises a shank for engaging the slot and terminating in a bulbous head for engagement of the socket and in which the shank includes attachment means for a net. By the use of an open socket of this construction the net can be relatively easily mounted on the posts by simply slipping the male member into each female member while it can be removed almost by an "unzipping" action in the sense that once they start to be pulled upwards and away from the slot, they will all be pulled in the one direction and all the male members will quickly fall away releasing the net.

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In a still further embodiment of the invention the bulbous head is rounded or a semi-sphere shape and in this embodiment a complementary cooperating underside surface of the adjacent slot of the female member is arcuate.

5 This configuration forms a ball and socket joint when the male and female members are interengaged. A cup is formed in the female member for reception of the rounded head. This arrangement advantageously provides a secure engagement of the male and female members in use,

10 retaining the male member in engagement with the female member. This configuration allows relative smooth movement between the male and female members when any force is placed on the head such as when a ball is driven into the net or a player falls against it. This ensures

15 that the net will not be torn and it provides added safety and will control the bounce of the ball against the net.

In another embodiment the bulbous head is a disc having a flat rear face for engagement with an inner face of the socket. In this arrangement preferably the head is an

20 interference fit in the socket or some other means is provided to retain the head in engagement with the socket in use.

In a preferred embodiment the flange is provided on the shank spaced-apart from the head, said flange being of

25 greater width than the slot, portion of the shank between the head and the flange being engagable with the slot.

In another embodiment the male member is an interference fit with the female member.

In a further embodiment the attachment means is

30 releasable. Alternatively, the attachment means may be

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lockable on the net.

Conveniently the attachment means used to connect the shank to the net can be a length of cord or a flexible strap incorporating strap locking means. It is also
5 envisaged that the shank might incorporate some form of plastics snap-on fitting to obviate the need for a flexible connector.

In a particularly preferred embodiment the strap locking means comprises a buckle mounted at an inner end of the
10 shank, the buckle having an eye for through passage of free end of the strap, a strap retaining mounted within the eye for engagement with complementary teeth on the strap when the strap is drawn through the eye of the buckle.

15 In a further embodiment net gripping means is provided on the strap. Conveniently the net gripping means comprises grip projections on the strap which are engagable with the net when the strap is mounted on the net. This conveniently prevents movement of the strap on the net.

20 Preferably figure grip means is provided on the shank to facilitate gripping the shank. The figure grip means may comprise a polarity of upstanding ribs on the shank.

In a further embodiment there is provided a net fixing device for releasable securing a net on a support such as
25 a goalpost of like, the net fixing device comprising;

a male member;

a female member for incorporating with the male member;

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the male and female members having complementary interengagable formations for releasable engagement of the male member with the female member;

5 means for permanently fixing one member to the goalpost; and

means for fixing the other member to a net.

In a preferred embodiment the female member comprises a base plate having means for fixing the base plate to the goalpost.

10 A body member on the base plate having a socket for reception of the male member.

A side wall of the socket having a slot.

The male member comprising a shank which is slidable engagable within the slot.

15 The shank having an inner end and an outer end.

A bogus head at the outer end of the shank. The head engagable with the socket.

Attachment means at the inner end of the shank for engagement with the net.

20 In another aspect the invention provides a net mounting kit comprising a plurality of the net fixing devices as claimed in any preceding claim. Typically the kit would comprise sufficient of the devices for mounting either one net on one set of goalposts or more preferably two nets on
25 two sets of goalposts.

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In a further embodiment the net mounting kit further includes a holder having means to engage and support a male member of the net fixing device to engage the male member with or release the male member from the female member. This conveniently assists the mounting of the net on the goalpost and practically on the cross bar of the goalpost.

Preferably the holder has a forked head for engagement with the shank of the male member.

Conveniently, the holder has a socket for mounting the holder on a pole. Thus for example the holder could be conveniently mounted and a free end of a broomhandler. The invention will be more clearly understood from the following description of some embodiments thereof, given by way of example only with reference to the accompanying drawings in which:-

Fig. 1 is a perspective view of portion of a goalpost and a net fixing device according to the invention;

Fig. 2 is a view of part of a goalpost with the net assembled;

Fig. 3 is an elevational view of a female member forming part of an alternative construction of net fixing device according to the invention;

Fig. 4 is a side cross-sectional view of the female member of Fig. 3 along the lines IV-IV of Fig. 3;

Fig. 5 is a plan view of the female member of Fig. 3;

Fig. 6 is a side view of a male member for use with the female member of Fig. 3;

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Fig. 7 is an end view of the male member of Fig. 6;

Fig. 8 is an elevational view of an alternative construction of male member according to the invention;

5 Fig. 9 is a plan view of the male member of Figure 8;

Fig 10 is a typical cross-sectional view of the male member of Fig. 8

10 Fig. 11 is a sectional view of the female member of Figs 3 and 4 in combination with the male member of Fig. 8;

Fig. 12 is a rear elevational view of a soccer goalpost with a set of female members mounted thereon;

15 Fig. 13 is a detail rear elevational view of a bottom end of an upright of the goalpost; showing the mounting arrangement for the lowermost female member;

20 Fig. 14 is a detail side elevational view of the bottom end of the upright showing the attachment of a net to the upright using net fixing devices accordingly to the invention;

Fig. 15 is an elevational view of a holder for mounting the male members on the female members; and

25 Fig. 16 is a sectional elevational view of the holder of Figure 15.

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Referring to the drawings and initially to Figs. 1 and 2 thereof, there is illustrated a net fixing device, according to the invention, indicated generally by the reference numeral 1 mounting a net 2 on a goalpost 3. The net fixing device 1 comprises a female member 4 and a male member 5. The female member 4 comprises a base plate 6 with a body member 6a incorporating a socket 7, having an open elongated slot 8 projecting inwardly of the socket mouth. It will be seen that the base plate 6 is mounted on the goalpost 3 by screws 9 or rivets which engage associated through holes in the base plate 6. The male member 5 comprises a bulbous head formed from a pair of circular plates 10 mounted on a shank 11 to which is connected a length of cord 12. The outer plate 10 is engagable with the socket 7.

In use, when the male member 5 is connected by the cord 12 to the net 2, once the male member is offered up to the slot 8 and engages within the socket 7, the net is securely connected to the goalpost 3. This is clearly illustrated in Figs. 1 and 2. When it is desired to remove the net from the goalpost, it is a simple matter to pull or knock the cord 12 upwards, disengaging the male member 5 from the female member 4.

Referring to Figs. 3 to 7 there is illustrated an alternative construction of net fixing device, comprising a male member indicated generally by the reference numeral 20 and a female member indicated generally by the reference numeral 21. Parts similar to those described with reference to the previous drawings are identified by the same reference numerals. In this embodiment the female member 21 has adjacent the slot 8 on the underneath surface thereof an arcuate surface 22 forming a cupped inner end of the socket 7 and this cooperates with a

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spherical surface forming portion of a bulbous head 23 on the male member 20. This effectively forms a ball and socket joint when the male and female members are engaged for secure engagement. An advantage of this arcuate surface and cooperating semi-spherical shape of the bulbous head 23 is that there is relative movement in a smooth way between the female member and the male member under any form of impact on the net 2.

Referring to Figs. 9 to 11, there is illustrated an alternative construction of male member indicated generally by the reference numeral 40 for use in conjunction with the female member of Figs. 3 and 4, thus the female member is identified by the reference numeral 21 and parts similar to those described with reference to the previous drawings are identified by the same reference numerals. In this embodiment there is provided a strap 41 on the end of the shank 11 which strap 41 incorporates teeth 42, illustrated more clearly in Fig. 10, which are adapted to engage a strap retaining lug or spigot 43 mounted within a buckle 44. Net gripping projections 45 project outwardly of the same side of the strap 41 as the teeth 42 to grip a net cord when the strap 41 is secured to the net. This prevents sliding movement of the strap 41 on the net. Figure 11 shows the male member 40 in engagement with the female member 21 illustrating the ball and socket joint formed between the bulbous head 23 of the male member 40 and the arcuate surface 22 of the socket 7. In use, to secure the male member 40 to the net a free end 48 of the strap is led around a net cord at the edge of a net and delivered up through an eye 49 of the buckle 44 as indicated by the arrows in Fig. 11, the teeth 42 engaging the spigot at 43 to securely fix the male member 40 on the net.

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Fig 12 shows a set of female members 21 mounted spaced-apart on the goalpost 3 for supporting the net 2. Figs. 13 and 14 shows a bottom end of an upright 50 of the goalpost 3. It will be noted that the lowermost female member 21 mounted on the upright 50 is attached upsidedown to retain the net 2 securely at the bottom end of each upright 50. As can be seen in Fig. 14 the lowermost edge of the net to is stretched downwardly to engage the lowermost male member 40 with the lowermost female member 21 on the upright 50, thus keeping the net taut.

It will be noted that the term goalpost as used throughout this Patent Specification is taken to mean any goal frame or part thereof for supporting a net.

Referring to Figs. 15 and 16 there is shown a holder 60 for engaging and releasing the male member 40 and female members 21. The holder 60 has a forked head 61 with a slot 62 for engaging the male member 40. A socket 63 is provided in the holder 60 for mounting the holder on a pole or the like for example for engaging and releasing the male and female members along an overhead crossbar of the goalpost. An opening 64 for a locking screw is provided in a sidewall of the socket 63.

Typically, in use a kit will be provided with a polarity of the net fixing devices sufficient for mounting a net on a goalpost or more usually formatting two nets and two goalposts. Ideally, one of the holders 60 is included with each kit.

It will be appreciated that while the embodiments describe fixing devices or connectors for attaching a net to a goalpost it is envisaged that the connectors may be used in other applications. For example, the connectors could

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be used for attachment of other netting to a support structure. Further, the connectors could be used for mounting covers and the like such as tarpaulins on supports or trailers for example.

- 5 The invention is not limited to the embodiments hereinbefore described which may be varied in both construction and detail.

CLAIMS

1. A net fixing device for goalposts and other structures used in games comprising a male member and a cooperating female member, one member for permanent
5 fixing to the goalpost and the other for fixing to the net.
2. A device as claimed in Claim 1 wherein the male member and the female member are interengaged to form a ball and socket joint.
- 10 3. A device is claimed in Claim 1 or 2 wherein the female member comprises a base plate mounting a body member incorporating a socket, having an open elongate slot in the body member projecting inwardly of a mouth of the socket and in which the male member
15 comprises a shank for engaging the slot and terminating in a bulbous head for engagement of the socket and in which the shank includes attachment means for engagement with a net.
- 20 4. A device is claimed in Claim 3 wherein the bulbous head is rounded and a complementary co-operating underside surface of the adjacent slot of the female member is arcuate to form a ball and socket joint when the male and female members are interengaged.
- 25 5. A device as claimed in Claim 3 wherein the bulbous head is a disc having a flat rear face for engagement with an inner face of the socket.
- 30 6. A device as claimed in any of Claims 3 to 5 wherein a flange is provided on the shank spaced-apart from the head, said flange being of greater width than the slot, portion of the shank between the head and the

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flange being engagable with the slot.

7. A device as claimed in Claim 3 wherein the male member is an interference fit with the female member.
- 5 8. A device as claimed in any of Claims 3 to 7 wherein the attachment means is releasable.
9. A device is claimed in any of Claims 3 to 7 wherein the attachment means used to connect the shank to the net is a length of cord extending outwardly from the shank.
- 10 10. A device as claimed in any of Claims 3 to 7 wherein the attachment means is lockable on the net.
- 15 11. A device as claimed in Claim 10 wherein the attachment means used to connect the shank to the net is a flexible strap incorporating strap locking means.
- 20 12. A device as claimed in Claim 11 wherein the strap locking means comprises a buckle mounted at an inner end of the shank, the buckle having an eye for through passage of a free end of the strap, a strap retaining lug mounted within the eye for engagement with complementary teeth on the strap when the strap is drawn through the eye of the buckle.
13. A device as claimed in Claim 11 or 12 wherein net gripping means is provided on the strap.
- 25 14. A device as claimed in Claim 13 wherein the net gripping means comprises grip projections on the strap which are engagable with the net when the strap is mounted on the net.

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15. A device as claimed in any of Claims 3 to 14 wherein finger grip means is provided on the shank.
16. A device as claimed in Claim 15 wherein the finger grip means is a plurality of upstanding ribs on the shank.
5
17. A net mounting kit comprising a plurality of the net fixing devices as claimed in any preceding claim.
18. A net mounting kit as claimed in Claim 17 which further includes a holder having means to engage and support a male member of the net fixing device to engage the male member with or release the male member from the female member.
10
19. A net mounting kit as claimed in Claim 18 wherein the holder has a forked head for engagement with the shank of the male member.
15
20. A net mounting kit as claim in Claim 18 or 19 wherein the holder has a socket for mounting the holder on a pole.
21. A net fixing device substantially as hereinbefore described with reference to the accompanying drawings.
20
22. A net mounting kit substantially as hereinbefore described with reference to the accompanying drawings.

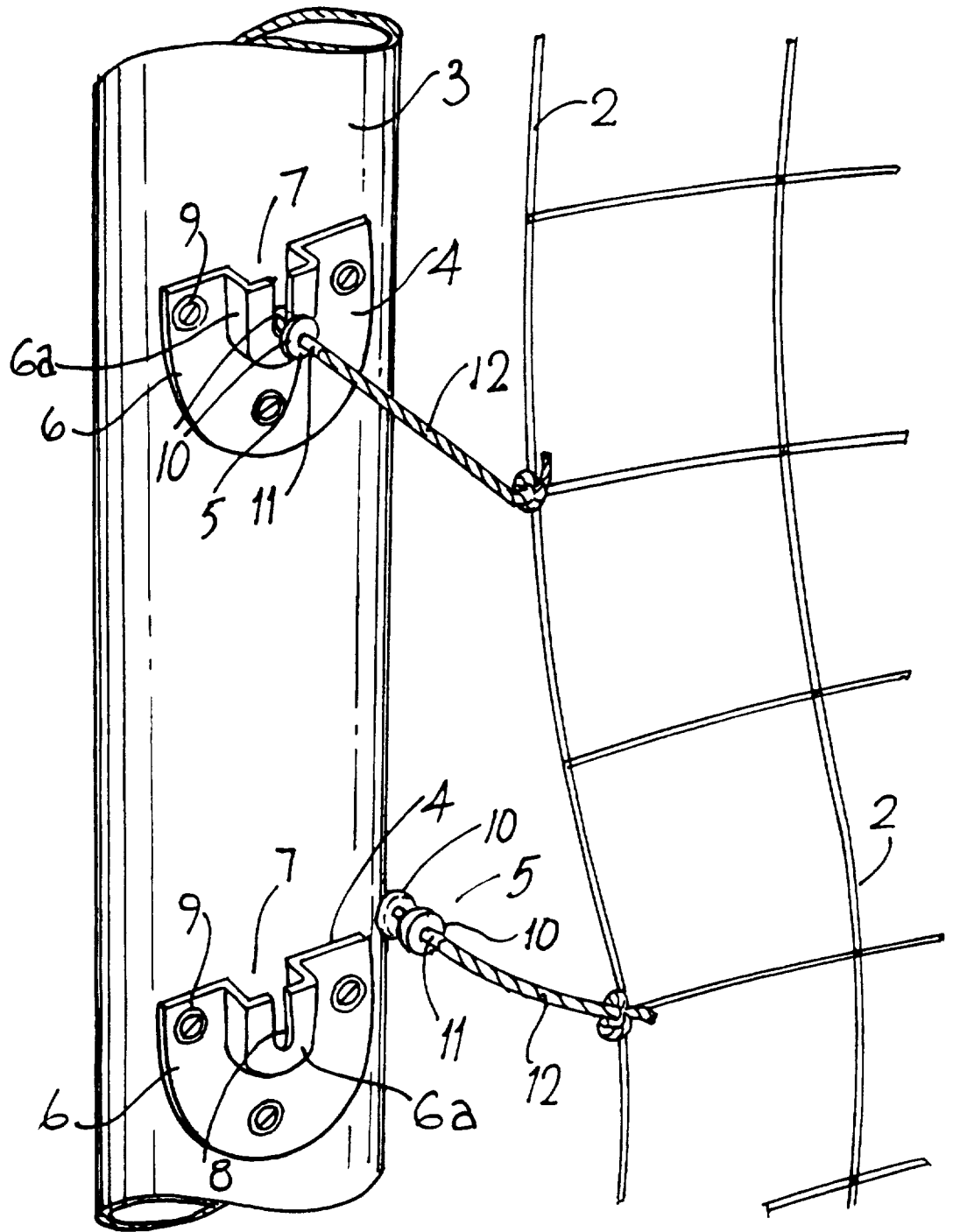


Fig.1

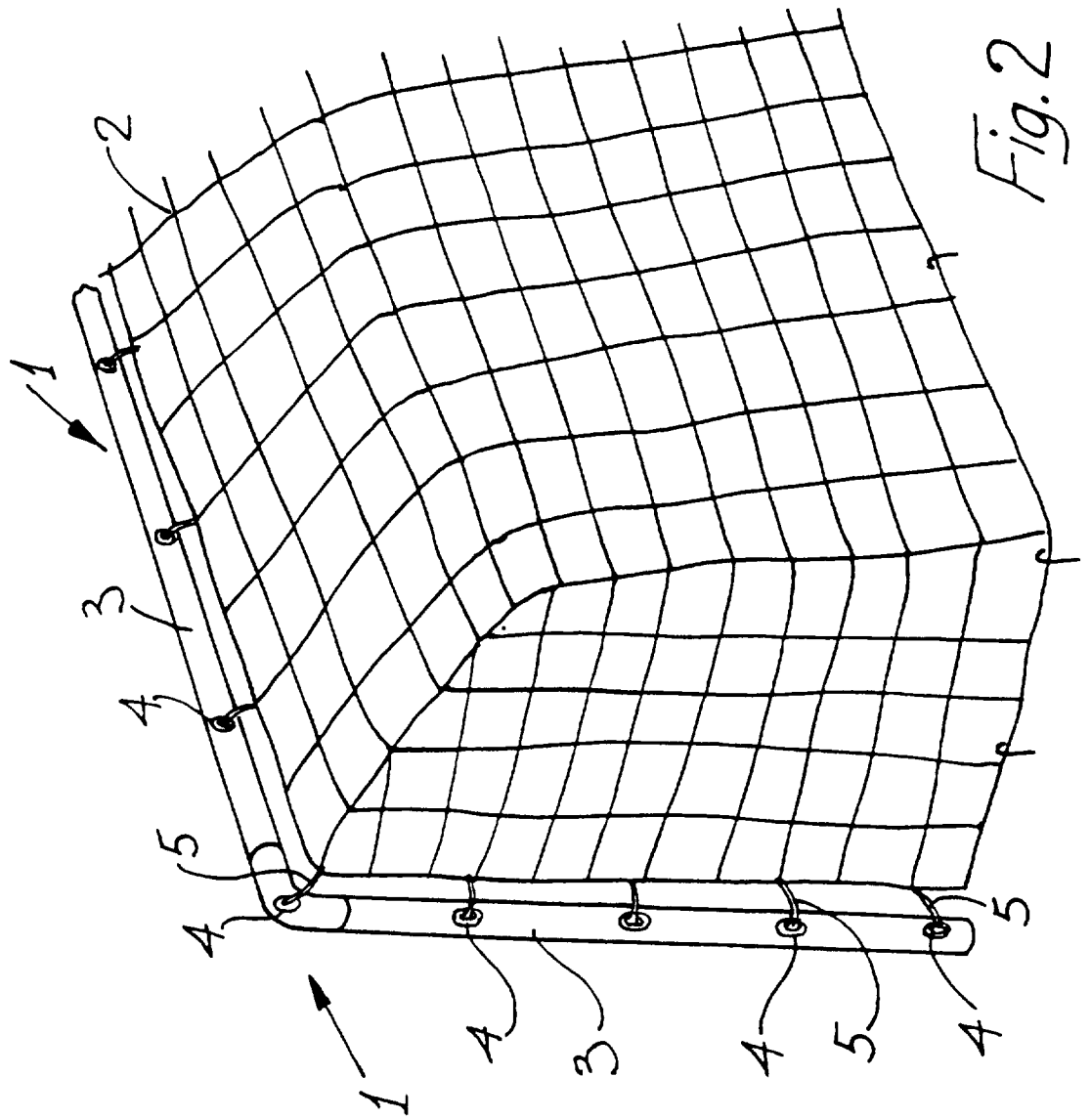


Fig. 2

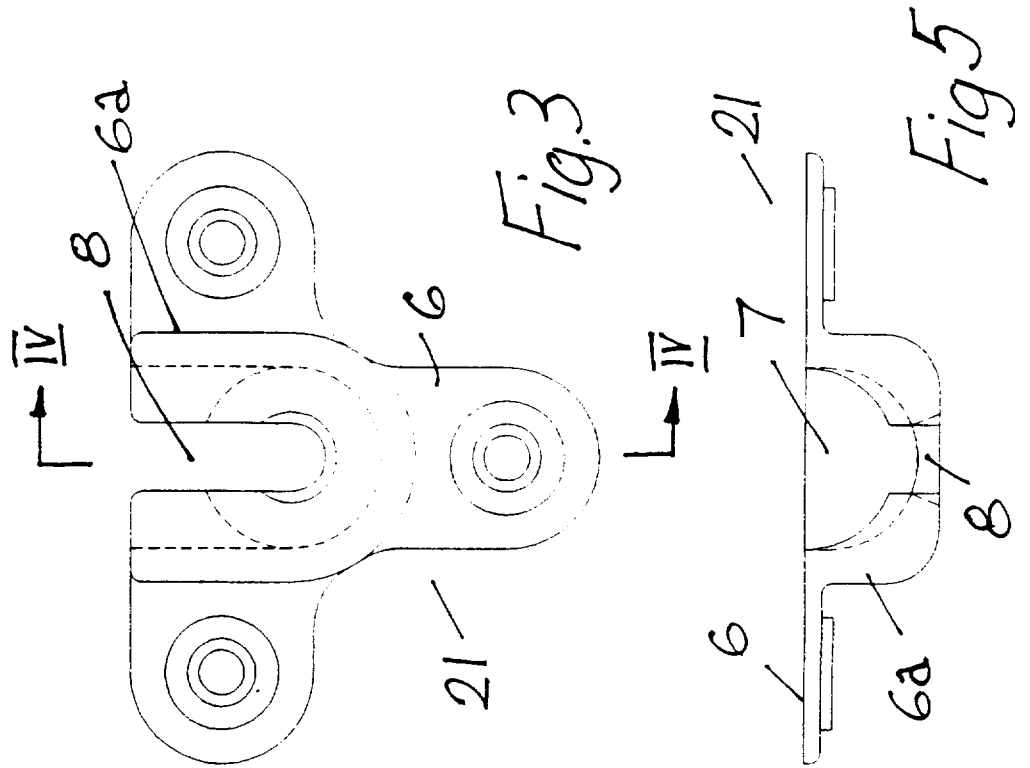


Fig. 3

Fig. 5

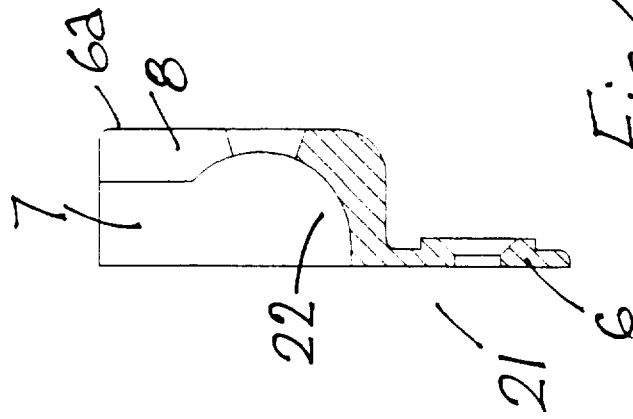


Fig. 4

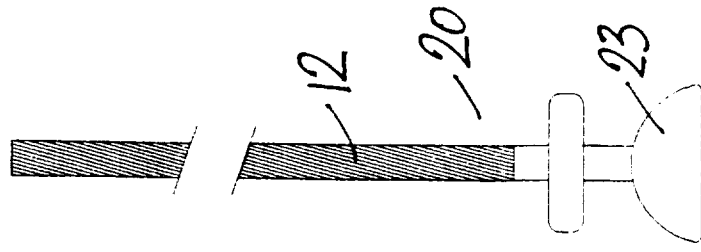


Fig. 6

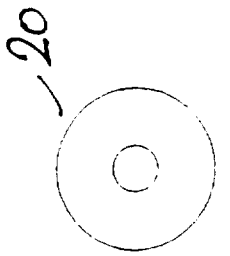
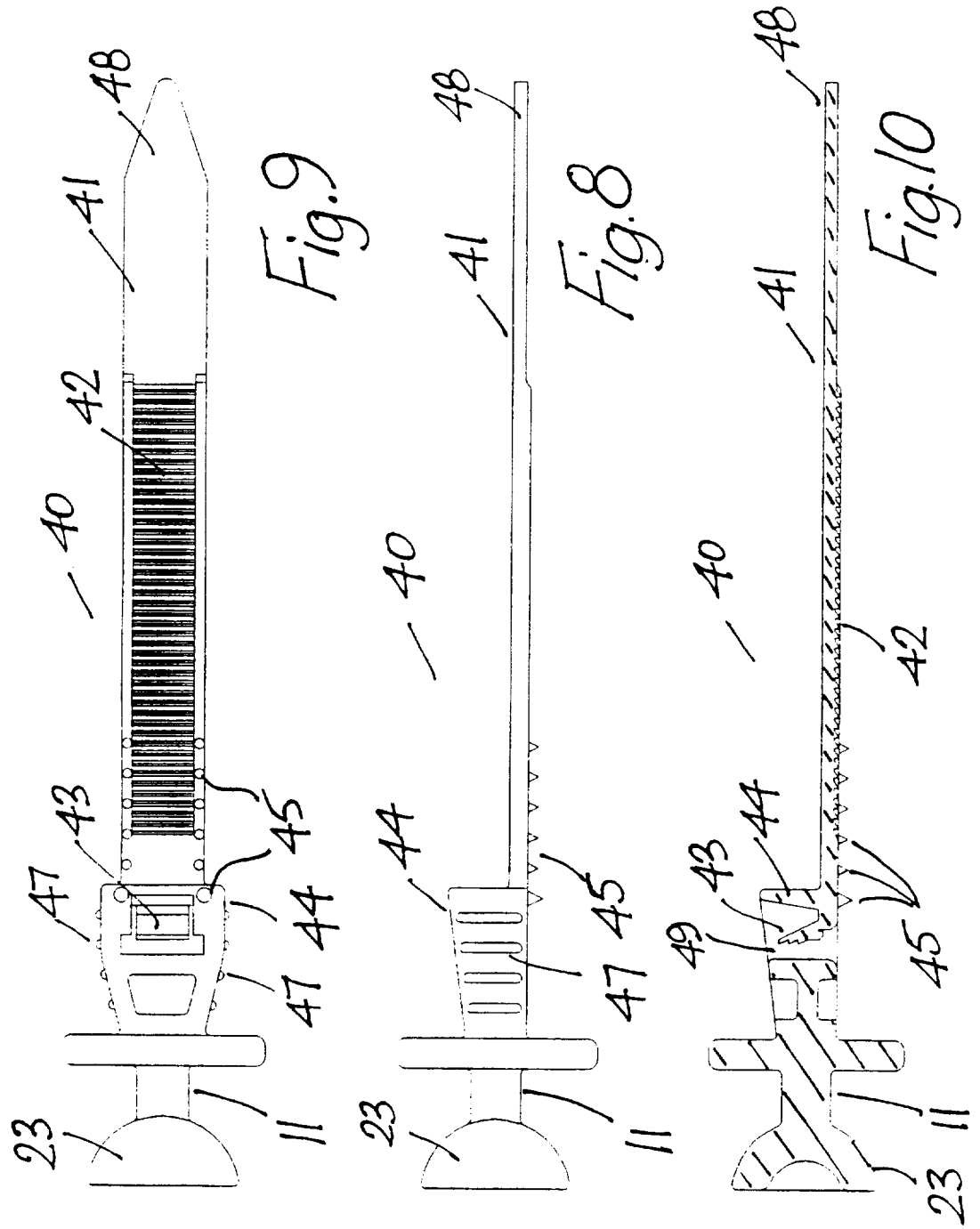


Fig. 7



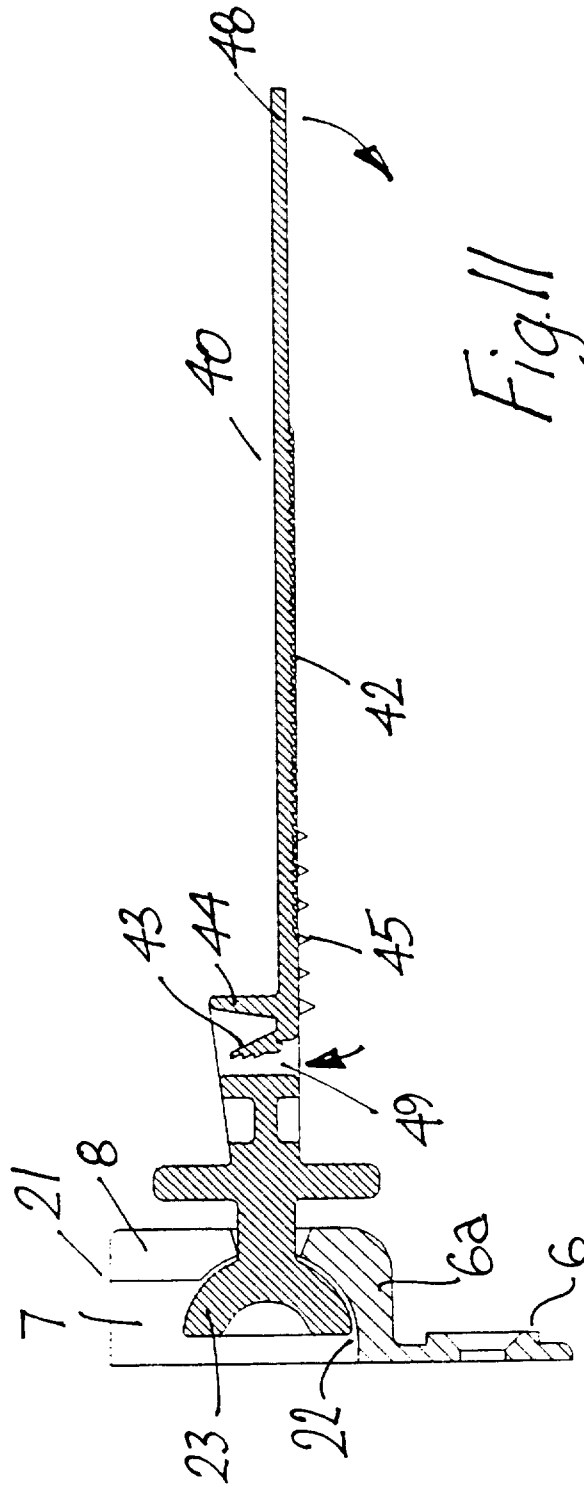


Fig.11

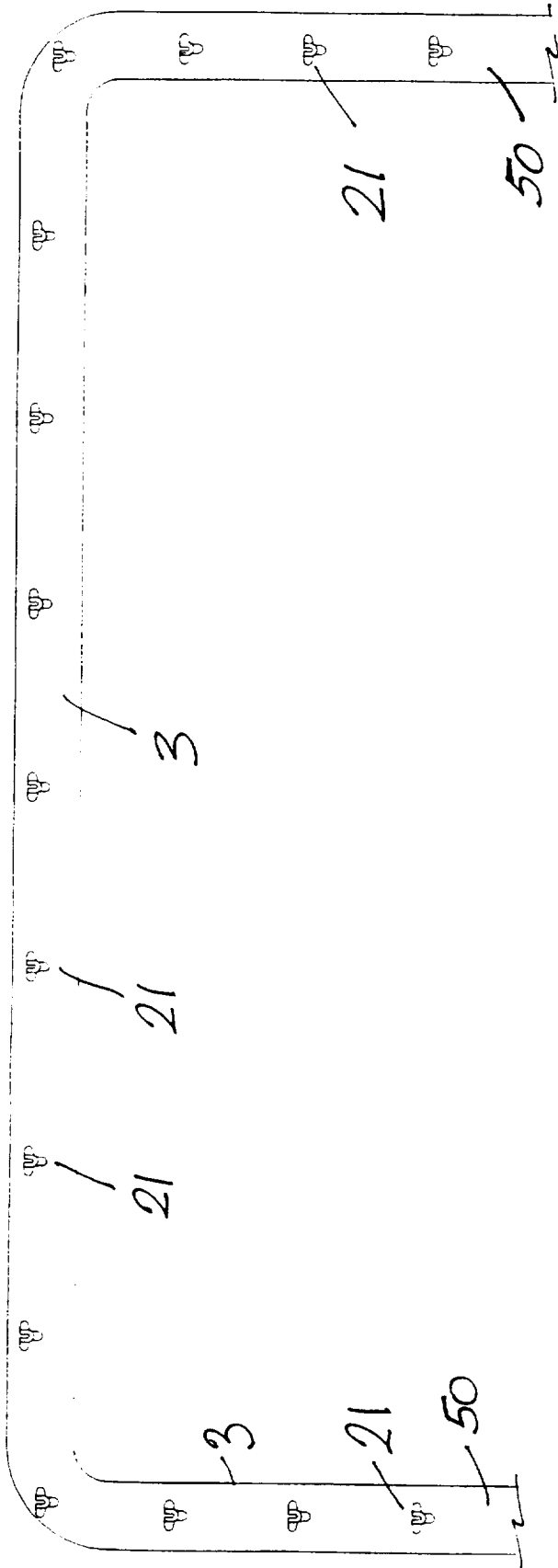
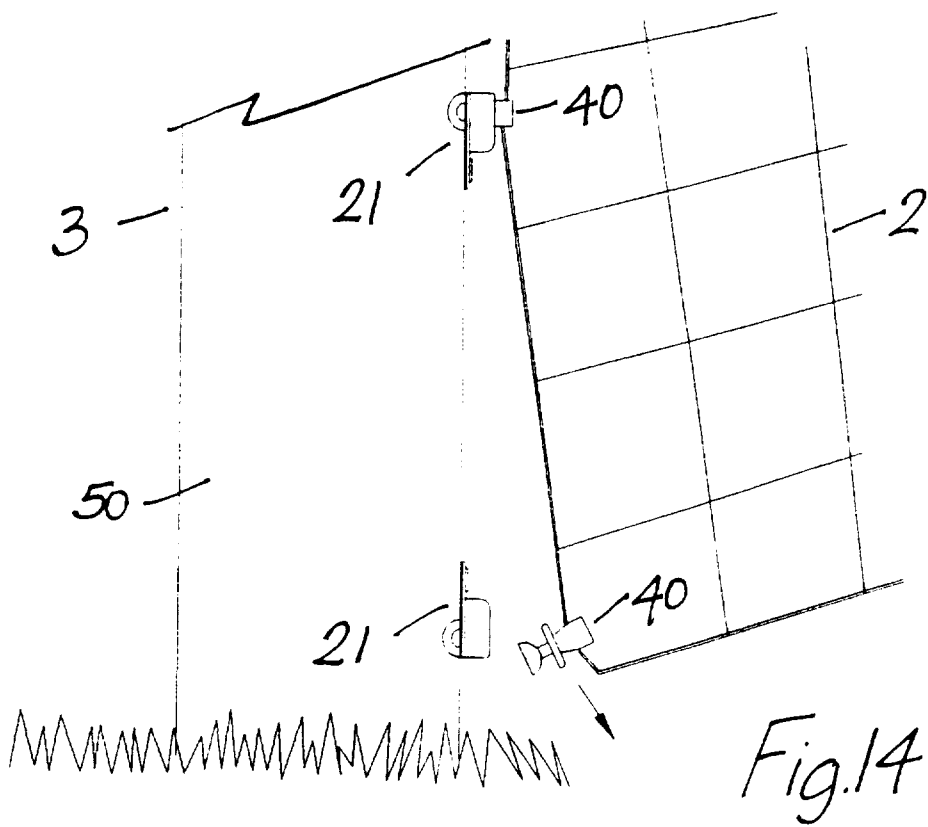
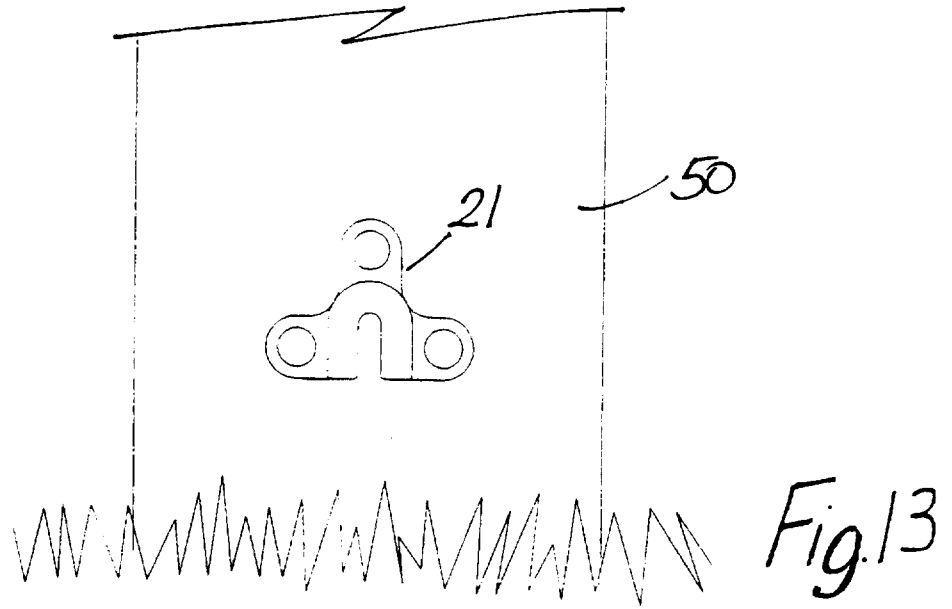
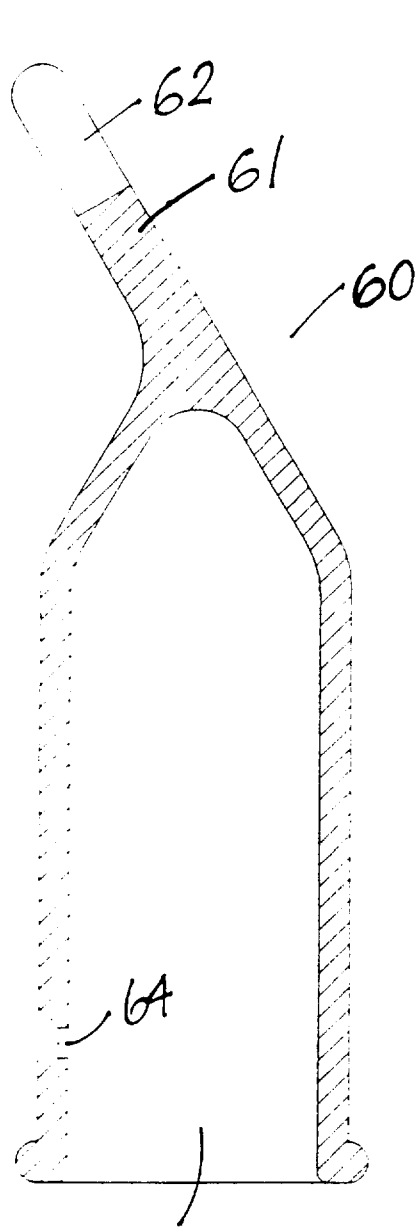


Fig.12





63
Fig 16

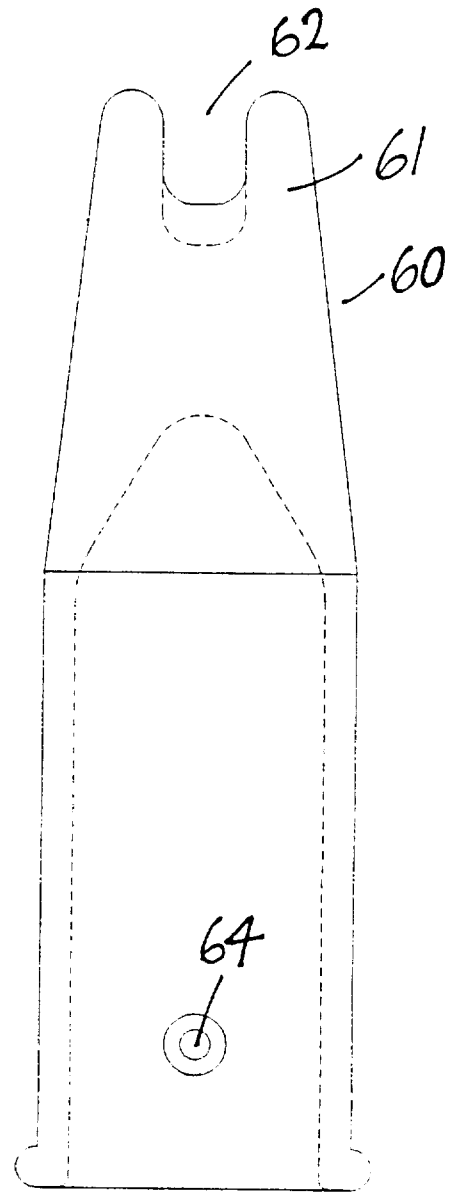


Fig. 15

INTERNATIONAL SEARCH REPORT

International Application No
PCT/IE 97/00032

A. CLASSIFICATION OF SUBJECT MATTER
IPC 6 A63B63/00

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)
IPC 6 A63B F16B E04H

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

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5 476 266 A (CARUSO VINCENT C) 19 December 1995 cited in the application see column 2, line 21 - line 44; figures	1,17,21,22
Y	---	2,3,5-8,10,15
Y	US 5 507 610 A (BENEDETTI NICHOLAS M ET AL) 16 April 1996 see abstract; figures	2,3,5-8,10,15
A	---	1,17,21,22
X	EP 0 502 279 A (SPORT FRANCE) 9 September 1992 cited in the application see column 2, line 31 - column 3, line 37; figure	1,2,17,21,22

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Further documents are listed in the continuation of box C.

Patent family members are listed in annex.

* Special categories of cited documents :

<p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier document but published on or after the international filing date</p> <p>"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p>	<p>"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</p> <p>"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone</p> <p>"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.</p> <p>"&" document member of the same patent family</p>
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Date of the actual completion of the international search	Date of mailing of the international search report
1 August 1997	18.08.97

Name and mailing address of the ISA European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+ 31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+ 31-70) 340-3016	Authorized officer Neumann, E
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Form PCT/ISA/210 (second sheet) (July 1992)

INTERNATIONAL SEARCH REPORT

International Application No

PCT/IE 97/00032

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	FR 2 560 774 A (SPOT) 13 September 1985 see claim; figure ---	1,17,21, 22
A	DE 295 01 259 U (LEONHARD ERHARD SÖHNE GMBH) 9 March 1995 see claim 1; figures ---	1,17,21, 22
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