CONVENTION

AUSTRALIA 666347

Patents Act 1990

REQUEST FOR A STANDARD PATENT

AND NOTICE OF ENTITLEMENT

The Applicant identified below requests the grant of a patent to the nominated person identified below for an invention described in the accompanying standard complete patent specification.

[70,71]Applicant and Nominated Person:

Daniel E. Andrew
524 Beechwood Drive, Unit 1, Waterloo, Ontario, N2T 5G9, CANADA

[54]Invention Title:

A CANNULA CLAMP

[72]Actual Inventors:

Daniel E. Andrew

[74]Address for Service:

PHILLIPS ORMONDE & FITZPATRICK
367 Collins Street
Melbourne 3000 AUSTRALIA

[31,33,32]

Details of basic application(s):-
829,633 UNITED STATES OF AMERICA US 3 February 1992

Applicant states the following:

1. The nominated person is the assignee of the actual inventor~~(s)~~

2. The nominated person is
~~- the applicant -~~
- the assignee of the applicant
~~- authorised to make this application by the applicant -~~
of the basic application.

3. The basic application~~(s)~~ was/~~were~~ the first made in a convention country in respect of the invention.

The nominated person is not an opponent or eligible person described in Section 33-36 of the Act.

29 January 1993

M 042879 290193

Daniel E. Andrew
By PHILLIPS ORMONDE & FITZPATRICK
Patent Attorneys
By

David B Fitzpatrick

Our Ref : 317016

5999q



AU9332112

(12) PATENT ABRIDGMENT (11) Document No. AU-B-32112/93
(19) AUSTRALIAN PATENT OFFICE (10) Acceptance No. 666347

(54) Title
A CANNULA CLAMP

International Patent Classification(s)
(51)[5] **A61B 017/34** **A61M 025/02**

(21) Application No. : **32112/93** (22) Application Date : **29.01.93**

(30) Priority Data

(31) Number	(32) Date	(33) Country
829633	**03.02.92**	**US UNITED STATES OF AMERICA**

(43) Publication Date : **05.08.93**

(44) Publication Date of Accepted Application : **08.02.96**

(71) Applicant(s)
DANIEL E. ANDREW

(72) Inventor(s)
DANIEL E. ANDREW

(74) Attorney or Agent
PHILLIPS ORMONDE & FITZPATRICK , 367 Collins Street, MELBOURNE VIC 3000

(56) Prior Art Documents
US 4973312
US 4392857
US 3167299

(57) Claim

1. A clamping device for frictionally securing a tube along its length without occluding said tube, including an elongated open-ended hollow cylindrical housing for receiving said tube axially therein, said housing having a housing wall with a pair of diametrically opposed openings formed transversely therein, and a clip having a pair of opposed flexible arms defining a tapered slot therebetween and joined at one end by a shank, said clip being insertable in snug-fitting relation through the openings formed in the housing wall perpendicular to the tube within the housing whereby the tube is loosely received for sliding engagement between the opposed arms of the clip upon retraction of the clip through the housing and whereby the tube is frictionally gripped by the opposed arms upon extension of the clip through the housing.

AUSTRALIA

Patents Act

666347

COMPLETE SPECIFICATION
(ORIGINAL)

Class Int. Class

Application Number:
Lodged:

Complete Specification Lodged:
Accepted:
Published:

Priority

Related Art:

Name of Applicant:

Daniel E. Andrew

Actual Inventor(s):

Daniel E. Andrew

Address for Service:

PHILLIPS ORMONDE & FITZPATRICK
Patent and Trade Mark Attorneys
367 Collins Street
Melbourne 3000 AUSTRALIA

Invention Title:

A CANNULA CLAMP

Our Ref : 317016
POF Code: 1224/194273

The following statement is a full description of this invention, including the best method of performing it known to applicant(s):

6006

BACKGROUND OF THE INVENTION

This invention relates to the field of catheters and, more particularly, relates to a clamping device for locking a cannula in a housing.

U.S. Patent No. 4,973,312 issued November 27, 1990, discloses a system for the insertion of a flexible catheter through the epidural space and dura-arachnoid membrane into the subarachnoid space of a spine. The system comprises a hollow needle having a sharpened entry end for insertion into the epidural space and an exit end having a hub, a cannula with a distal end adapted for placement into and for axial movement within the hollow needle whereby said cannula can be advanced forwardly within the hollow needle for abutment of the distal end against the dura-arachnoid membrane to place tension on the dura-arachnoid membrane, and securing means adapted to be attached to the hub at the exit end of the hollow needle for locking the cannula within the hollow needle from axial movement.

It is a principal object of the present invention to provide a clamping device for securing the cannula to the epidural needle while the cannula exerts pressure on the dura.

PATENT OFFICE

BRIEF SUMMARY OF THE INVENTION

According to a broad aspect of this invention there is provided a clamping device for frictionally securing a tube, such as a cannula, along its length without occluding the tube, including an elongated open-ended hollow cylindrical housing for receiving the tube axially therein, the housing having a housing wall with a pair of diametrically opposed openings formed transversely therein, and a clip having a pair of opposed flexible arms defining a tapered slot therebetween and joined at one end by a shank, the clip being insertable in snug-fitting relation through the openings formed in the housing wall perpendicular to the tube within the housing whereby the tube is loosely received for sliding engagement between the opposed arms of the clip upon retraction of the clip through the housing and whereby the tube is frictionally gripped by the opposed arms upon extension of the clip through the housing.

In at least one embodiment of this invention, the clip shank has a head at one end with a diameter greater than the diameter of the openings and wherein the opposed flexible arms have barbed tips at the distal ends thereof cooperating with the housing wall whereby the clip can move freely transversely within the housing between the head and the barbed tips.

In at least one embodiment of the invention, the tapered slot has a width adjacent to the clip shank less than the diameter of the tube whereby the tube is frictionally gripped between the opposed arms against the housing wall for securement of the tube without occlusion of the tube upon extension of the clip into the housing.

In at least one embodiment of the invention, the barbed tips are pointed and the spacing of the points is less than the width of the openings to facilitate insertion of the arms into the openings and wherein the width of barbs is greater than the width of the holes to restrain the clip from withdrawal from the housing.

In at least one embodiment of the invention, the hollow cylindrical housing has a tapered extension at one end for insertion into a hub of an epidural needle and wherein the tube is a cannula inserted into the epidural needle.

BRIEF DESCRIPTION OF THE DRAWINGS

A clamping device in accordance with a preferred embodiment of the invention will now be described with reference to the accompanying drawings, in which:

Figure 1 is an elevation of an epidural needle with a cannula extending therethrough, secured by the clamping device of the invention, inserted into the epidural space of a spine;

Figure 2 is a perspective view of the clamping device shown in Figure 1, partly cut away, securing the cannula from axial movement;

Figure 3 is a section along line 3-3 of Figure 2 showing the clip in a retracted position within the housing;

Figure 4 is a section corresponding to Figure 3 showing the clip in a fully extended cannula-engaging portion within the housing; and

AUSTRALIA PATENT OFFICE

Figure 5 is a section corresponding to Figure 3 showing the clip in a partially retracted cannula-engaging position within the housing;

Figure 6 is a section corresponding to Figure 3 showing the clip in a retracted position which frees the cannula from the clip arms.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Figure 1 of the drawings illustrates the placement of a hollow epidural needle 10 having a sharpened end 12 together with a cannula 13 extending therethrough and inserted into the back 14 of a patient between the spinous processes 16 of the vertebrae and through the ligamentum flavum 18 into the epidural space 20. The opposite end of needle 10 has a hub 22 having a conventional conical interior for receiving the forward tapered extension 24 of a clamping device 26 for securing the cannula from axial movement, to be described in detail with reference to Figures 2-6.

Clamping device housing 28 is an elongated cylindrical thin-walled hollow sleeve or housing preferably made of plastic having open end 30 with enlarged head 32 and opposite end with tapered extension 24 and shoulder 36. Extension 24 makes a snug friction fit with hub 22 of epidural needle 10. Cannula 13 passes loosely through housing 28 and needle 10 to extend into epidural space 20.

AUSTRALIA PATENT OFFICE

A pair of diametrically opposed transverse holes 40, 42 are formed in sleeve 28. Holes 40, 42 can be rectangular, e.g. elongated, square, or round or oval in shape. A clip 44 having a shank 46 and opposed spaced-apart arms 48, 50 extending axially from shank 46, formed from a flexible plastic, has a shape corresponding with the shape of holes 40, 42 for a snug sliding fit therein. Tapered slot 52 defined between arms 48, 50 has a width greater than the diameter of cannula 13 at the distal ends 54, 56 and a width less than the diameter of cannula 13 adjacent shank 46 for reasons which will become evident as the description proceeds.

The distal ends 54, 56 of arms 48, 50 preferably have pointed tips 58, 60 with a spacing less than the height of holes 40, 42 and outer barbs 58, 60 with a spacing greater than the height of openings 40, 42 to facilitate insertion of the clip 44 into holes 40, 42 and to restrain clip 44 from removal from housing 28.

In operation, tubular cannula 13 which extends through epidural needle 10 between arms 48, 50 of clip 44, as shown in Figures 2 and 3, is extended into epidural space 20 for abutment against the dura-arachnoid membrane 62 to place the membrane 62 in tension, as described in U.S. Patent 4,973,312, incorporated herein by reference. Clip 44 is then extended transversely through housing 28, as shown

in Figure 4, to push cannula 13 against the interior of housing 28 and to force the cannula towards the narrow end of slot 52 to pinch the cannula between arms 48, 50. Arms 48, 50 preferably are broad, i.e. sufficiently wide to avoid crushing the cannula. Clip 44 can then slide freely within housing 28 in holes 40, 42, as shown in Figure 5, with cannula 13 securely gripped thereby to maintain a desired tension on membrane 62. When it is desired to release cannula 13, clip 44 is gripped by head 68 and retracted within housing 28 to the position shown in Figure 6 whereby the cannula abuts the interior of housing 28 and is pulled free from the grip of arms 48, 50 adjacent shank 46.

It will be understood that modifications can be made in the embodiment of the invention illustrated and described herein without departing from the scope and purview of the invention as defined by the appended claims.

AUSTRALIAN PATENT OFFICE

THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:

1. A clamping device for frictionally securing a tube along its length without occluding said tube, including an elongated open-ended hollow cylindrical housing for receiving said tube axially therein, said housing having a housing wall with a pair of diametrically opposed openings formed transversely therein, and a clip having a pair of opposed flexible arms defining a tapered slot therebetween and joined at one end by a shank, said clip being insertable in snug-fitting relation through the openings formed in the housing wall perpendicular to the tube within the housing whereby the tube is loosely received for sliding engagement between the opposed arms of the clip upon retraction of the clip through the housing and whereby the tube is frictionally gripped by the opposed arms upon extension of the clip through the housing.

2. A clamping device as claimed in claim 1 wherein the clip shank has a head at one end with a diameter greater than the diameter of the openings and wherein the opposed flexible arms have barbed tips at the distal ends thereof cooperating with the housing wall whereby the clip can move freely transversely within the housing between the said head and said barbed tips.

3. A clamping device as claimed in claim 2 wherein the tapered slot has a width adjacent to the clip shank less than the diameter of the tube whereby the tube is frictionally gripped between the opposed arms against the housing wall for securement of the tube without occlusion of the tube upon extension of the clip into the housing.

4. A clamping device as claimed in claim 3 wherein the barbed tips are pointed and the spacing of the points is less than the width of the openings to facilitate insertion of the arms into the openings and wherein the width of barbs is greater than the width of the holes to restrain the clip from withdrawal from the housing.

5. A clamping device as claimed in any one of claims 1 to 4 wherein said hollow cylindrical housing has a tapered extension at one end for insertion into a hub of an epidural needle and wherein said tube is a cannula inserted into the epidural needle.

AUSTRALIAN PATENT OFFICE

6. A clamping device for frictionally securing a smooth surface cannula along its length without occluding said cannula for axial adjustment and for retaining the cannula in the hub of an epidural needle, including an epidural needle, an elongated open-ended, hollow cylindrical housing connected to the hub of the epidural needle for receiving said cannula axially therein, said housing having a housing wall with a pair of diametrically opposed holes formed transversely therein, a clip having a pair of opposed flexible arms defining a tapered slot therebetween and joined at one end by a shank, said clip insertable in snug-fitting relation through the holes formed in the housing wall perpendicular to the cannula within the housing whereby the cannula is loosely received for sliding engagement between the opposed arms of the clip upon retraction of the clip within the housing and whereby the cannula is frictionally gripped by the opposed arms upon extension of the clip within the housing, said clip shank having a head at one end with a diameter greater than the diameter of the holes and the opposed flexible arms having barbed tips at the distal ends thereof cooperating with the housing wall whereby the clip can move freely transversely within the housing between the said head and said barbed tips while being restrained from removal from the housing.

7. A clamping device as claimed in claim 6 wherein the tapered slot has a width adjacent to the clip shank less than the diameter of the cannula whereby the cannula is frictionally gripped between the opposed arms against the housing wall for securement of the cannula without occlusion of the cannula upon extension of the clip into the housing.

8. A clamping device as claimed in claim 6 or claim 7 wherein said hollow cylindrical housing has a tapered extension at one end for insertion into a hub of the epidural needle for a friction fit therein.

9. A clamping device as claimed in any one of claims 6 to 8 wherein the barbed tips are pointed and the spacing of the points is less than the width of the holes to facilitate insertion of the arms into the holes and wherein the width of barbs is greater than the width of the holes to restrain the clip from withdrawal from the housing.

AUSTRALIA PATENT OFFICE

10. A clamping device as claimed in any one of the preceding claims wherein the clip is formed from a flexible plastic.

11. A clamping device as claimed in claim 10 wherein the clip has a rectangular cross-section.

12. A clamping device as claimed in claim 10 wherein the clip has a round cross-section.

13. A clamping device as claimed in claim 10 wherein the clip has an oval cross-section.

14. A clamping device substantially as herein described with reference to the accompanying drawings.

DATED : 15 November, 1995
PHILLIPS ORMONDE & FITZPATRICK
Attorneys for:
DANIEL E ANDREW

ABSTRACT

A clamping device is disclosed for securing a cannula in an epidural needle. The clamping device comprises a cylindrical housing seated in an epidural needle, the housing having a pair of diametrically opposed openings in which the arms of a clip are inserted to loosely receive the cannula or engage the cannula as desired.

151195 3212

FIG.1.

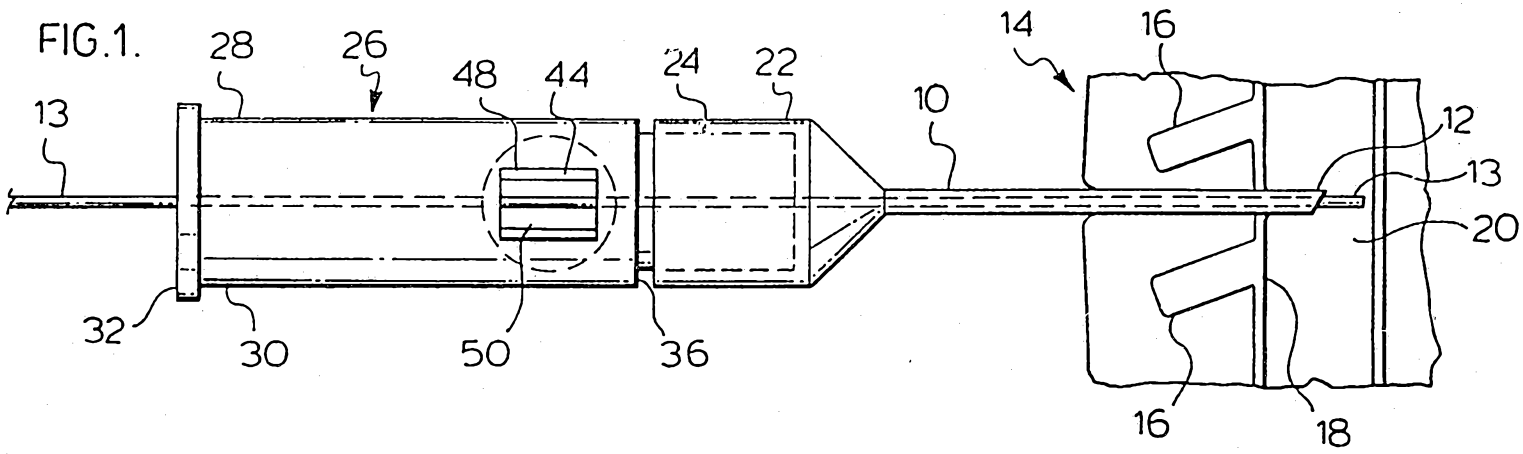
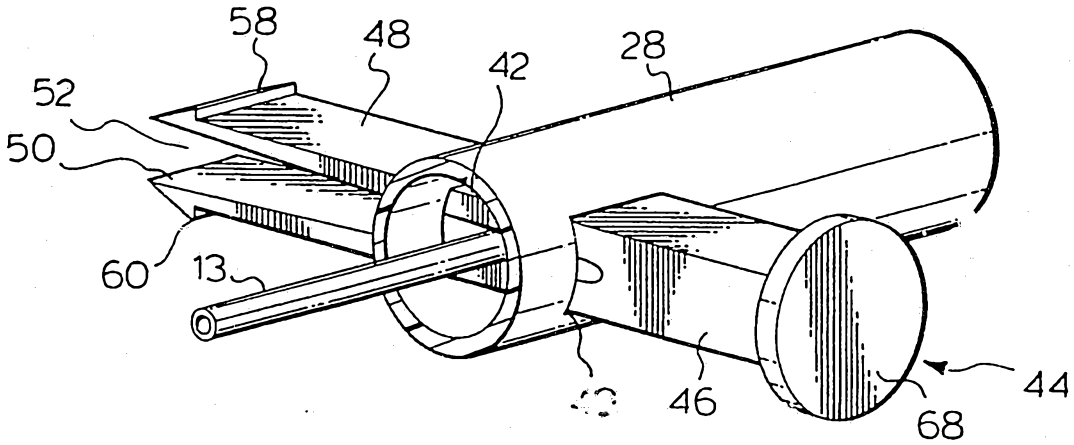


FIG.2.



3212/93

FIG. 3.

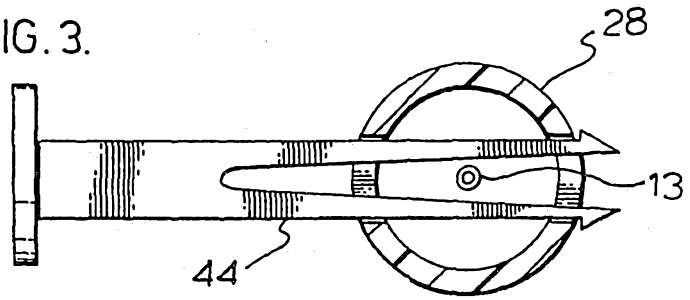


FIG. 4.

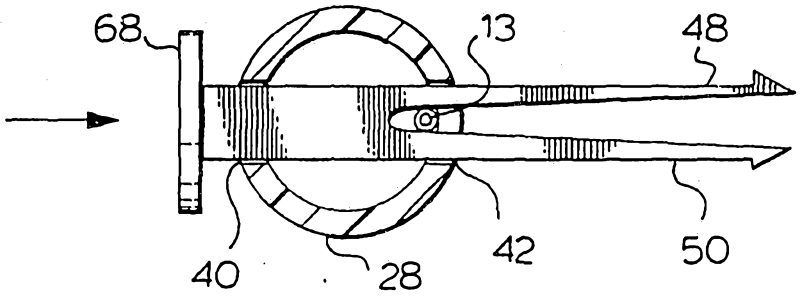


FIG. 5.

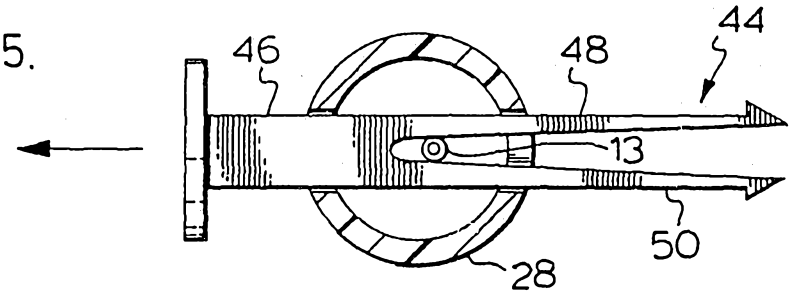


FIG. 6.

