

FORM 1

610639

REGULATION 9

COMMONWEALTH OF AUSTRALIA

PATENTS ACT 1952

APPLICATION FOR A STANDARD PATENT

We, HILTI AKTIENGESELLSCHAFT, a Corporation organised under the laws of the Principality of Liechtenstein, of Schaan, Liechtenstein, hereby apply for the grant of a Standard Patent for an invention entitled:-

"STRADDLING DOWEL"

which is described in the accompanying Complete Specification.

Details of basic application:-

Number: P37 30 860.2

Country: Federal Republic of Germany

Date: 15th September, 1987

Our address for service is:

SHELSTON WATERS

55 Clarence Street

SYDNEY, N.S.W. 2000.

DATED this 8th Day of September, 1988

HILTI AKTIENGESELLSCHAFT

by *P. Heathcote*

Fellow Institute of Patent Attorneys of Australia
of SHELSTON WATERS

To: The Commissioner of Patents
WODEN A.C.T. 2606

File: H-7

Fee: \$135.00

002252 09/09/88

COMMONWEALTH OF AUSTRALIA PATENTS ACT, 1952-1973
DECLARATION IN SUPPORT OF A CONVENTION APPLICATION FOR A PATENT

In support of the Convention Application No. made
(a) Here Insert (In full) Name of Company. by (a) HILTI AKTIENGESELLSCHAFT
FL-9494 Schaan

(hereinafter referred to as "Applicant") for a patent for an invention entitled:

(b) Here Insert Title of Invention. (b) "STRADDLING DOWEL"

We (c) Herbert Hässig

(c) and (d) Here Insert Full Name and Address of Company Official authorised to make declaration. Roland Wildi

of (d) FL-9494 Schaan

..... Principality of Liechtenstein

do solemnly and sincerely declare as follows:

1. I am authorised by Applicant to make this declaration on its behalf.

2. The basic Application(s) as defined by section 141 of the Act was/were made

(e) in WEST GERMANY on the 15th day of September 1987

..... on the day of 19 ..

(f) by HILTI AKTIENGESELLSCHAFT

(g) Armin HERB, Wiesenweg, D-8921 Apfeldorf

3.

is/are

the actual Inventor(s) of the invention and the facts upon which Applicant is entitled to make the Application are as follows:

Applicant is the Assignee of the said Inventor(s).

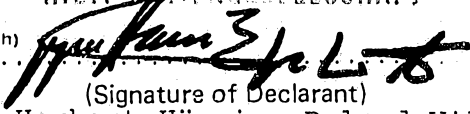
4. The basic Application(s) referred to in paragraph 2 of this Declaration was/were the first Application(s) made in a Convention country in respect of the invention, the subject of the Application.

DECLARED at Schaan

this 12th day of July 1988

HILTI AKTIENGESELLSCHAFT

(h) Personal Signature of Declarant (c) (no seal, witness or legalisation).

(h) 

(Signature of Declarant)

Herbert Hässig Roland Wildi

To THE COMMISSIONER OF PATENTS.

SHELSTON WATERS

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Cables: 'Valid' Sydney Telex: 24422

(12) PATENT ABRIDGMENT (11) Document No. AU-B-22024/88
(19) AUSTRALIAN PATENT OFFICE (10) Acceptance No. 610639

(54) Title
STRADDLING DOWEL

International Patent Classification(s)
(51)⁴ **F16B 013/12 F16B 013/02**

(21) Application No. : **22024/88** (22) Application Date : **09.09.88**

(30) Priority Data

(31) Number (32) Date (33) Country
3730860 15.09.87 DE FEDERAL REPUBLIC OF GERMANY

(43) Publication Date : **16.03.89**

(44) Publication Date of Accepted Application : **23.05.91**

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(56) Prior Art Documents
GB 569774
GB 640451
US 21596952

(57) Claim

1. Straddling dowel with a sheet metal straddling sleeve which is, at least in part, axially slotted, has an inner thread starting at its rear end which faces in an insertion-opposite direction, and is provided with a bore the diameter of which decreases towards the front end, as well as with circumferentially spaced and substantially longitudinally extending flanges which flatten to the outside, characterized in that the flanges have at least one side which is inclined towards the longitudinal axis of the sleeve and faces the rear end of the straddling sleeve.

COMMONWEALTH OF AUSTRALIA

610639

FORM 10

PATENTS ACT 1952

C O M P L E T E S P E C I F I C A T I O N

FOR OFFICE USE:

Application Number:
Lodged:

Class

Int. Class

Complete Specification Lodged:
Accepted:
Published:

Priority:

Related Art:

Name of Applicant:

HILTI AKTIENGESELLSCHAFT

Address of Applicant:

Schaan, Liechtenstein

Actual Inventor:

Armin Herb

Address for Service: SHELSTON WATERS, 55 Clarence Street, Sydney

Complete Specification for the Invention entitled:

"STRADDLING DOWEL"

The following statement is a full description of this invention,
including the best method of performing it known to us:-

Straddling Dowel

The present invention deals with a straddling dowel with a sheet metal straddling sleeve which is, at least in part, axially slotted, has an inner thread starting at its rear end which faces in an insertion-opposite direction, and is provided with a bore the diameter of which decreases towards the front end as well as with flanges which flatten to the outside.

Frequently, dowels made of a synthetic material are used for less critical anchoring purposes. However, these plastic dowels have the disadvantage that the anchoring is destroyed in case of fire. Thus, these dowels are being replaced, on an increasing scale, by sheet metal dowels.

These sheet metal dowels which are known, for example, from the GB-PS 569 774 consist of a rolled straddling sleeve with a screw thread for a fastening screw. For the purpose of straddling the sleeves of these known dowels have a bore, the width of which diminishes towards the front end, whereby this bore is created by flanges which are flattened outwards.

These known dowels have the advantage that they are easily and inexpensively manufactured, they do however have the disadvantage that their anchorage values decrease dramatically if the hole drilled into the receiving material is too large or if the receiving material is too soft.

It is the objective of the present invention to create a straddling dowel which is easily and inexpensively

manufactured and has anchoring values which are sufficiently high for all application purposes.

According to one broad form of the invention there is provided a straddling dowel with a sheet metal straddling sleeve which is, at least in part, axially slotted, has an inner thread starting at its rear end which faces in an insertion-opposite direction, and is provided with a bore the diameter of which decreases towards the front end, as well as with circumferentially spaced and substantially longitudinally extending flanges which flatten to the outside, characterized in that the flanges have at least one side which is inclined towards the longitudinal axis of the sleeve and faces the rear end of the straddling sleeve.

During the straddling process the projecting flanges which are flattened outwards are at least partially pressed into the bore hole walls of the receiving material. The side of the flanges which faces the rear end of the straddling sleeve thus closely moulds with the receiving material, whereby load application points are created which act against the direction of stretch. This results in anchoring values which are maintained even with inaccurate bore holes and soft receiving materials.

An advantageous mode of execution consists in that the flanges have a width which increases in the direction of the front end. This flange width which increases in the direction of the front end results in an enlarged support surface of the straddling dowel on the bore hole walls, whereby an even distribution of the straddling pressure is achieved. The side which faces the rear end of the straddling sleeve is thus formed by at least one of the lateral sides of the flange.

A further advantageous mode of execution consists in that the flanges are inclined towards the longitudinal axis of the straddling sleeve. Such an arrangement of the flanges has the result that one of the sides of the flanges forms the side which faces the rear end of the



- 3a -

straddling sleeve. Preferably, the direction of inclination of the flanges is such that they face the threading direction of the inner thread. This prevents the straddling sleeve becoming unscrewed from the bore hole when a screw is threaded.



10. Preferably, the flanges are executed so that the diameter of the circular enclosure enveloping the flanges increases towards the front end of the straddling sleeve. Thus, the side of the flanges which faces the rear end of the straddling sleeve is formed by the surface area of the straddling sleeve. This enables a large contact area between the straddling sleeve and the bore hole walls. The diameter of the enclosure enveloping the flanges may increase, towards the front end of the straddling sleeve, either continuously or gradually so that sides are produced which are inclined towards or vertical to the longitudinal axis of the straddling sleeve, and face the rear end of the straddling sleeve.

20. Preferably, the pitch of the inner thread is pressed or rolled into the sizing prior to the rolling procedure. This procedure enables an only limited accuracy of the inner thread. It is, therefore an advantage if the ridges between the flanges have a radius which decreases in the threading direction of the inner thread. This mode of execution of ridges remaining between the flanges facilitates an easier introduction of a screw into the straddling sleeve in that the flanks of the screw thread gear completely only after a specific twisting angle has been reached. This mode of execution of the ridges also results in a favourable distribution of the straddling pressure along the entire periphery and/or circumference.

30. It is of advantage to provide the straddling sleeve with a continuous enlargement around its front end. Such a continuous enlargement reinforces the front end of the sleeve which is excessively stressed during the straddling process, whereby a damage to the straddling sleeve is prevented. The bending and/or folding of the enlargement preferably occurs prior to the rolling procedure for the production of the straddling sleeve.

Preferably, the enlargement is bent outwards. An enlargement which is bent outwards, comes into contact with the bore hole walls during the straddling process, thus facilitating an even distribution of the straddling pressure. The free edge of the enlargement, which faces the rear end of the straddling sleeve, enables an additional and tight bracketing in the bore hole wall, where higher stretch values are reached. The outward bending of the enlargement causes a curvature at the front end of the straddling dowel which facilitates an easier insertion of the straddling dowel in the bore hole.

The outside diameter of the enlargement is essentially equal to the largest outside diameter of the straddling sleeve. This ensures that the enlargement comes into close contact with the bore hole walls at the very beginning of the straddling process. Such a close contact of the enlargement with the bore hole walls assists in preventing a turning of the straddling sleeve together with the turning movement necessary when introducing a screw for straddling purposes.

The rear, free end of the enlargement extends along the front half of the straddling sleeve which ensures the secure introduction of the screw. In the area of the flanges, the enlargement may be provided with recesses which prevent an excessive overlapping of material in this region.

The invention is described in greater details by way of examples depicted in the following drawings:

Figure 1 shows a straddling dowel, partially in a longitudinal section,

Figure 2 shows a cross-section, along lines II-II, of the straddling dowel depicted in Figure 1,

Figure 3 shows a section of the straddling dowel of Figure 2, on an enlarged scale,

Figure 4 shows a further mode of execution of a straddling dowel,

Figure 5 shows yet another mode of execution of a straddling dowel, partially in a longitudinal section,

Figure 6 shows a front view of the straddling dowel of Figure 5, corresponding to the arrow VI.

The straddling dowel depicted in Figures 1 to 3 has a straddling sleeve with a front end 11 which faces in the direction of insertion, and a rear end 12. The straddling sleeve 10 is provided with a bore 13 the diameter of which decreases towards the front end, and also features an inner thread 14 which starts at its rear end. The straddling sleeve 10 is equipped with flanges 15 which are flattened outwards and are arranged in a longitudinal direction. The flanges 15 have a width b which increases in the direction of the front end 11. This width of the flanges 15 which increases towards the front end 11 results in sides 16, 17 which face the rear end 12 of the straddling sleeve. The ridges 18 between the flanges 15 have a radius R which decreases in the threading direction of the inner thread 14 and facilitates an easier introduction of a screw into the inner thread of the straddling sleeve, the screw enabling an expansion of the straddling sleeve 10. The radial expandability of the straddling sleeve 10 is facilitated by its being provided with a longitudinal slot 19.

The straddling dowel depicted in Figure 4 has a straddling sleeve 20 with a front end 21 which faces in the direction of insertion, and a rear end 22. The straddling sleeve 20 is provided with flanges 25. These flanges 25 are arranged inclined towards the longitudinal axis of the straddling sleeve 20. This inclined arrangement of the flanges 25 results in the sides 26 of the flanges 25 facing the rear end 22.

The straddling dowel depicted in Figures 5 and 6 has a straddling sleeve 30 with a front end 31 which faces in the direction of insertion, and a rear end 32. The straddling sleeve 30 is provided with a bore 33 the diameter of which decreases towards the front end 31, and also features an inner thread 34 which starts at its rear end 32. In the area which decreases in width towards its front end 31, the straddling sleeve 30 is provided with flanges 35 which flatten outwards. The flanges 35 are executed in such a manner that the diameter D of the circular enclosure enveloping the flanges 35 increases towards the front end 31 of the straddling sleeve 30. Thus, the flanges 35 have sides 36 which face the rear end 32. The straddling sleeve 30 is reinforced in that its front end 31 is provided with an enlargement 38 which is bent outwards. The outside diameter A of the enlargement 38 is essentially equal to the largest outside diameter C of the straddling sleeve 30. This enables a satisfactory contact of the straddling sleeve 30 with the bore hole walls and an even distribution of the straddling pressure. Furthermore, the straddling sleeve 30 is provided with a longitudinal slot for the radial expandability of the straddling sleeve 30.

THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:-

1. Straddling dowel with a sheet metal straddling sleeve which is, at least in part, axially slotted, has an inner thread starting at its rear end which faces in an insertion-opposite direction, and is provided with a bore the diameter of which decreases towards the front end, as well as with circumferentially spaced and substantially longitudinally extending flanges which flatten to the outside, characterized in that the flanges have at least one side which is inclined towards the longitudinal axis of the sleeve and faces the rear end of the straddling sleeve.
2. Straddling dowel according to claim 1, characterized in that the flanges have a width which increases in the direction of the front end.
3. Straddling dowel according to claims 1 or 2, characterized in that the flanges are inclined towards the longitudinal axis of the straddling sleeve.
4. Straddling dowel according to one of the claims 1 to 3, characterized in that the diameter of a circular enclosure enveloping the flanges increases towards the front end of the straddling sleeve.
5. Straddling dowel according to one of the claims 1 to 4, characterized in that ridges between the flanges have a radius which decreases in the threading direction of the inner thread.
6. Straddling dowel, especially according to one of the claims 1 to 5, characterized in that the straddling sleeve is provided with a continuous enlargement around its front end.
7. Straddling dowel according to claim 6, characterized in that the enlargement is bent outwards.
8. Straddling dowel according to claim 7, characterized in that the outside diameter of the enlargement is essentially equal to the largest outside diameter of the straddling sleeve.
9. Straddling dowel according to one of the claims 6 to 8, characterized in that the rear, free end of the enlargement extends along the front half of the straddling sleeve.



10. A straddling dowel substantially as herein described with reference to Figures 1 to 3, Figure 4 or Figures 5 and 6 of the accompanying drawings.

DATED this 8th Day of September, 1988

HILTI AKTIENGESELLSCHAFT

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Fellow Institute of Patent Attorneys of Australia
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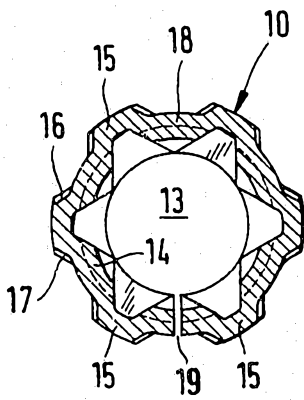


Fig. 2

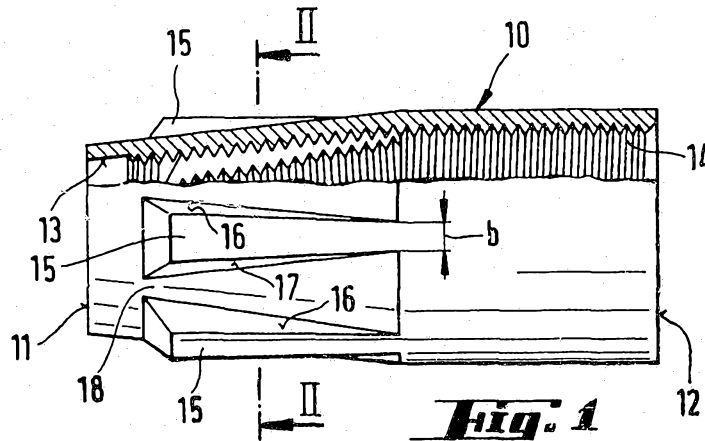


Fig. 1

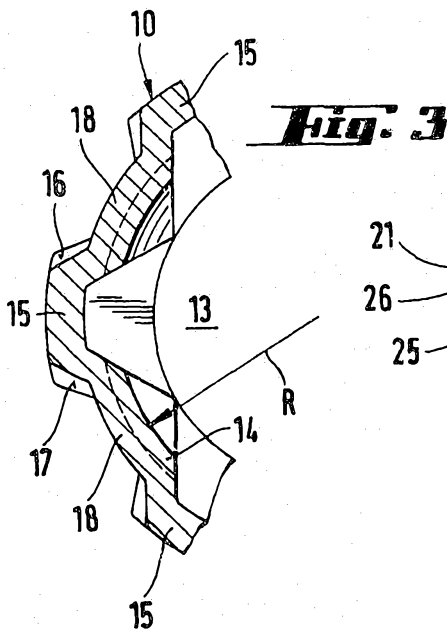


Fig. 3

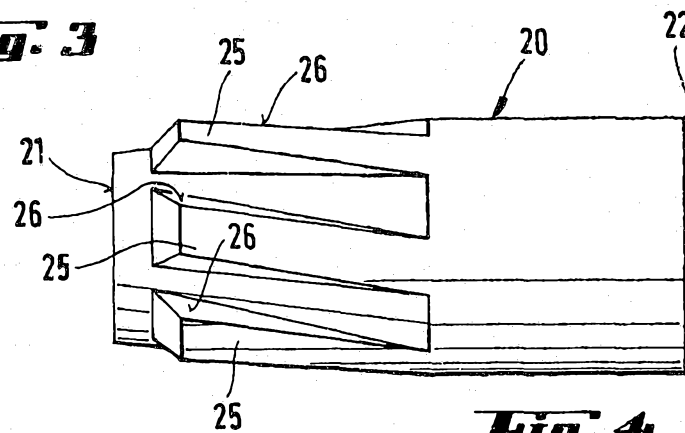


Fig. 4

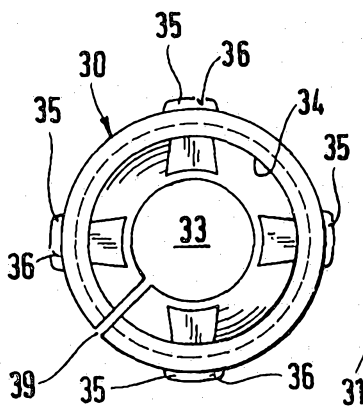


Fig. 6

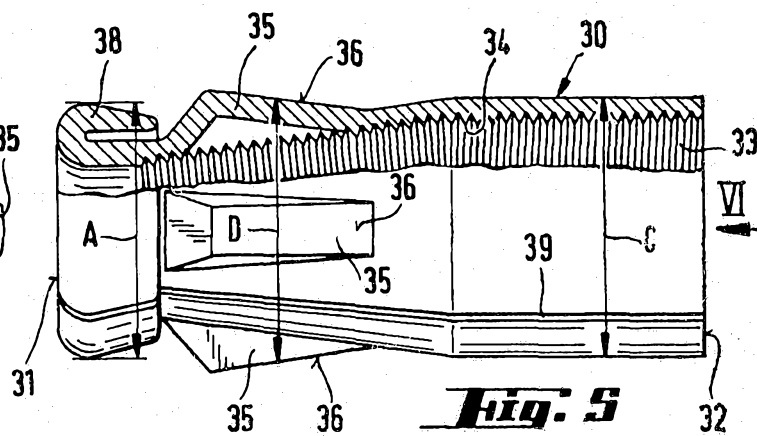


Fig. 5