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(54) Title
ANCHORING SYSTEM FOR INSTALLING EXTERIOR MATERIALS TO A BUILDING STRUCTURE

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(71) Applicant(s)
YOUICHI ENDO; SHUJI ENDO; SHOZO ENDO

(72) Inventor(s)
YOUICHI ENDO; SHOZO ENDO; SHUJI ENDO

(74) Attorney or Agent
DAVIES COLLISON CAVE , 1 Little Collins Street, MELBOURNE VIC 3000

(56) Prior Art Documents
US 4984947
US 4860516
CH 598438

(57) Claim

1. An anchoring system for installing exterior materials to a building structure, comprising:
- a separator rod having two ends;
 - a nut joint embedded in a hole in the side face of material to be attached to the structure, said nut joint having means for receiving and holding one end of the separator rod, while allowing the other end of the separator rod to extend from the side face of the material to be attached to the structure;
 - an anchoring device for mounting into a hole of the structure, said anchoring device having a receiving aperture dimensioned to receive the other end of the separator rod, said anchoring device further comprising ratchet means for allowing the

(10) 670085

other end of the separator rod to advance into the receiving aperture and for inhibiting movement of the separator rod out of the receiving aperture.

11. A system for installing exterior materials to a building structure, comprising:

an anchoring device for mounting into a hole in the structure, said anchoring device having a receiving aperture, an enlarged end portion having a recess larger than the receiving aperture and having a threaded male exterior;

a nut ring to be received within the end portion recess, said nut ring having flaps extending more radially inwardly than the diameter

of the anchoring device receiving aperture;
a cap having means for coupling with the anchoring device for holding the nut ring within the recess, and having an aperture to align with the fastening device aperture;

a nut joint having means for mounting into a blind hole in the side face of material to be attached to the structure, said nut joint having an internally threaded receiving aperture; and

a separator rod having threaded end portions, including a first end portion for threaded engagement within the internal nut joint receiving aperture, and a second end portion for extending from the side face of the material, for being received and held by the nut ring flaps when received in the anchoring device receiving aperture.

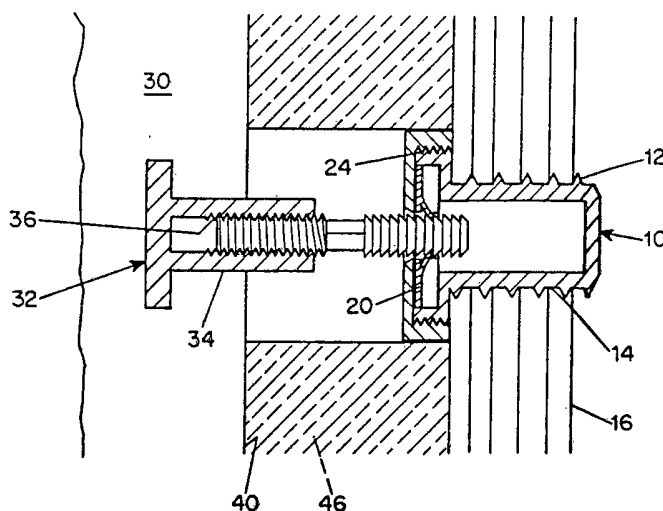


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(21) International Application Number: PCT/US93/03783 (22) International Filing Date: 22 April 1993 (22.04.93) (30) Priority data: 07/874,053 24 April 1992 (24.04.92) US (71)(72) Applicants and Inventors: ENDO, Youichi [JP/US]; 20 Weil Place, Cresskill, NJ 07626 (US). ENDO, Shozo [JP/JP]; ENDO, Shuji [JP/JP]; 7-23-10 Shakujii-Dai, Nerimaku, Tokyo (JP). (74) Agent: WHITE, John, P.; Cooper & Dunham, 30 Rockefeller Plaza, New York, NY 10112 (US).		(81) Designated States: AU, CA, JP, European patent (AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE). Published <i>With international search report.</i> 670085

(54) Title: ANCHORING SYSTEM FOR INSTALLING EXTERIOR MATERIALS TO A BUILDING STRUCTURE



(57) Abstract

The present invention relates to an anchoring system and method for installing exterior materials (30) to a building structure (16) particularly suited for when the exterior materials (30) are to be placed at a distance from the building structure (16). The anchoring system utilizes a separator rod (38) having two ends wherein one end is secured within a nut joint (32) embedded in the exterior material (30) and the other end is attached to an anchoring device (10) anchored to the building structure (16). The anchoring device (10) has a speed nut (20) which accepts the other end of the separator rod (38), allowing the rod (38) to advance into the anchoring device (10) but which inhibits movement of the separator rod (38) out of rod away from the anchoring device (10) in a ratchet fashion.

**ANCHORING SYSTEM FOR INSTALLING
EXTERIOR MATERIALS TO A BUILDING STRUCTURE**

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Background Of The Invention

10 The present invention relates to an anchoring system for installing exterior materials to a building structure particularly suitable for when the exterior materials are to be spaced at a distance from the structure.

15 The use of insulation as a component of a building is now widely practiced to obtain better comfort and to conserve energy used for heating and cooling. However, if the insulation is placed between the structure and internal walls various problems can arise due to water condensation within the wall. There are also limitations of available wall constructions.

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One solution to this problem is to place the insulation material outside the building structure. This method also gives a protection to the structure from the expansion and contraction caused by the temperature change at the various time of the year. Moreover, a building built with heavy materials such as concrete will store heat when the insulation is placed outside the structure.

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30 Other benefits of having the exterior material cover the insulation material placed outside of a building structure include fire proofing and water proofing from the outside. Additionally, there are advantages in the weather proofing and protecting the structure from exterior impacts. Furthermore, the exterior materials would allow for a wide variety of design possibilities.

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However, insulation materials are usually soft and can not hold heavy exterior materials. Also, the exterior materials

placed at a distance from the structure exert great downward forces and are difficult to attach to the supporting structure. Consequently, these problems restrict the type of exterior materials that can be attached to an existing building structure, especially at distances from the structure, even though this would be ideal from the building science point of view. It also becomes difficult to attach and support exterior materials to a building structure. It is therefore important to have a connection system that is strong enough to support these exterior materials without being too difficult to attach.

This method and anchoring system solves the above problems so that exterior materials can be easily and securely attached to a building structure in order to obtain the benefits of having the insulation material placed outside of the structure.

Furthermore, since the method according to the invention is an easy installation method from outside of the structure, it saves labor time and can be placed on existing building structures with ease.

Summary Of The Invention

For the purpose of attaining the objects mentioned, the present invention provides an anchoring system for installing exterior materials to a building structure, comprising a separator rod having two ends, a nut joint embedded in a hole in the side face of material to be attached to the structure, the nut joint having means for receiving and holding one end of the separator rod while allowing the other end of the separator rod to extend from the side face of the material to be attached to the structure, an anchoring device for mounting into a hole of the structure, the anchoring device having a receiving aperture dimensioned to receive the other end of the

separator rod, the anchoring device further comprising ratchet means for allowing the other end of the separator rod to advance into the receiving aperture and for inhibiting movement of the separator rod out of the receiving aperture.

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The present invention also provides an anchoring system for installing exterior materials to a building structure, comprising an anchoring device for mounting into a hole in the structure, the anchoring device having a receiving aperture, an enlarged end portion having a recess larger than the receiving aperture and having a threaded male exterior, a nut ring to be received within the end portion recess, the nut ring having flaps extending more radially inwardly than the diameter of the anchoring device receiving aperture, a cap having means for coupling with the anchoring device for holding the nut ring within the recess, and having an aperture to align with the fastening device aperture, a nut joint having means for mounting into a blind hole in the side face of material to be attached to the structure, the nut joint having an internally threaded receiving aperture, and a separator rod having threaded end portions, including a first end portion for threaded engagement within the internal nut joint receiving aperture, and a second end portion for extending from the side face of the material, for being received and held by the nut ring flaps when received in the anchoring device receiving aperture.

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The present invention also provides a method for installing exterior materials to a building structure, comprising mounting an anchoring device into a hole in the structure, the anchoring device having a receiving aperture and flaps extending more radially inwardly than the diameter of the anchoring device receiving aperture, mounting a nut joint into a hole in the side face of material to be attached to the structure, the nut joint having internal engagement means, mounting a two ended separator rod into the nut joint



so that one end is engaged by the internal engagement means, and so that the other end extends from the side face of material to be mounted to the structure, and inserting the other end of the separator rod into the anchoring device receiving aperture so that the flaps engage and hold the separator rod, whereby the exterior material is attached to the building structure.

In another aspect, there is provided an anchoring system for installing exterior material to a building structure, said structure having a hole defined therein for mounting the material, comprising:

- 10 a separator rod having two ends;
- an anchoring device for mounting into the hole of the structure, said anchoring device having a receiving aperture dimensioned to receive one end of the separator rod, said anchoring device further comprising ratchet means for allowing said one end of the separator rod to advance into the receiving aperture and for inhibiting movement of the separator rod out of the receiving aperture; and
- 15 a nut joint adapted to be attached to the material to be attached to the structure, said nut joint having means for receiving and holding the other end of the separator rod, said nut joint having an extending flange for supporting and holding building material to the exterior of the building after the nut joint, separator rod and anchoring device are connected to the building structure.

In another aspect, there is provided a method for installing exterior material to the exterior surface of a building structure, said structure having a hole defined therein for mounting the material, comprising:

- 25 mounting an anchoring device in to the hole in the structure, said anchoring device having a receiving aperture dimensioned to receive and hold an end of a two ended separator rod; and

performing the following steps, not necessarily in the following order: mounting one end of the separator rod to a nut joint having internal engagement means to hold and engage one end of the separator rod, and inserting the other end of the separator rod into the anchoring device.



Brief Description of the Drawings

Fig. 1 is an elevational view, in cross-section of an embodiment of an anchoring system for installing exterior materials to a building structure according to the present invention; and

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Fig. 2 is an exploded view of an embodiment of the anchoring system for installing exterior materials to a building structure according to the present invention.

Detailed Description of The Preferred Embodiment

- 10 The present invention provides an anchoring system for installing exterior materials to a building structure, comprising a separator rod having two ends, a nut joint embedded in a hole in the side face of material to be attached to the structure, the nut joint having means for receiving and holding one end of the separator rod while allowing the other end of the separator rod to extend from the side face of the material to be attached to the
- 15 structure, an anchoring device for mounting into a hole of the structure, the anchoring device having a receiving aperture dimensioned to receive the other end of the separator rod, said anchoring device further comprising ratchet means for allowing the other end of the separator rod to advance into the receiving aperture but for inhibiting movement of the separator rod out of the receiving aperture.



Preferably, the separator rod has two threaded ends. The nut joint is preferably embedded into a blind hole in the side of material to be attached to the structure. The nut joint may have a threaded female opening and one end of the separator rod has a correspondingly sized threaded male end. The ratchet means may comprise flaps extending radially inwardly in the receiving aperture, and wherein the separator rod has an undulating surface on its other end for engagement with the flaps.

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The anchoring device preferably comprises a fastening device having an exterior threaded surface for mounting in a hole of the structure. The anchoring system may further comprise an enlarged end portion, a speed nut received in the enlarged end portion, the speed nut having radially inwardly extending flaps, and means for retaining the speed nut in the enlarged end portion.

The means for retaining may comprise an exterior male thread on the enlarged end portion and a screw cap having an internally threaded female thread to mate with the thread on the enlarged end portion. The screw cap may have at least one flattened edge surface for aiding in threadingly engaging the screw cap to the enlarged end portion. The screw cap may have six flattened edge surfaces arranged to form a hexagon.

According to another aspect of the invention, a system for installing exterior materials to a building structure is provided, comprising an anchoring device for mounting into a hole in the structure, the anchoring device having a receiving aperture, an enlarged end portion having a recess larger than the receiving aperture and having a threaded male exterior, a nut ring to be received within the end portion recess, the nut ring having flaps extending more radially inwardly than the diameter of the anchoring device receiving aperture, a cap having means for coupling with the

anchoring device for holding the nut ring within the recess, and having an aperture to align with the fastening device aperture, a nut joint having means for mounting into a blind hole in the side face of material to be attached to the structure, the nut joint having an internally threaded receiving aperture, and a separator rod having threaded end portions, including a first end portion for threaded engagement within the internal nut joint receiving aperture, and a second end portion for extending from the side face of the material, for being received and held by the nut ring flaps when received in the anchoring device receiving aperture.

According to another aspect of the invention, a method for installing exterior materials to a building structure is provided, comprising mounting an anchoring device into a hole in the structure, the fastening device having a receiving aperture and flaps extending more radially inwardly than the diameter of the anchoring device receiving aperture, mounting a nut joint into a hole in the side face of material to be attached to the structure, the nut joint having internal engagement means, mounting a two ended separator rod into the nut joint so that one end is engaged by the internal engagement means, and so that the other end extends from the side face of material to be mounted to the structure, and inserting the other end of the separator rod into the anchoring device receiving aperture so that the flaps engage and hold the separator rod, whereby the exterior material is attached to the building structure.

The present invention described herein is used to securely attach exterior materials to a building structure. The ability to accomplish this has become increasingly important in view of recent construction trends in using decorative exterior materials and in having insulation outside the building structure.

In the preferred embodiment of the present invention as shown in Figs. 1 and 2, an anchoring device 10 having external threads 12 adapted to be screwed into a hole 14 of a building structure 16. The anchoring device also includes a recessed portion 18 which contains and holds a speed nut mechanism 20 that is held in place by a screw cap 22.

5 The screw cap 22 has internal threads 24 which threadingly engage external threads 26 on anchoring device 10. The screw cap 22 may be round as shown in the bottom of Fig. 2, or may have one or more flattened edge surfaces 28 (in this case 6) as shown in the top of Fig. 2 to aid in engaging and tightening the screw cap 22 to the anchoring device 10.

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Exterior material 30 such as a panel of stone, e.g., which is to be attached to the building structure 16 has a nut joint 32 embedded in a blind hole 34. The nut joint 32 has an internally threaded receiving aperture 36 and an extending peripheral flange 33 at its inner end.

15

A separator rod 38 has one end screwed into the threaded aperture 36 of the nut joint 32 and the other end extending out from the face 40 of the material 30 to be attached to the structure 16.

20

The speed nut mechanism 20 has a ratchet means in the form of radially inwardly extending flaps 42. The exterior material 30 may be attached to the structure 16 by inserting the other end of the separator rod 38 into the anchoring device 10. The speed nut mechanism 20 ratchet arrangement allows the separator rod 38 to advance into a receiving aperture 44 in the anchoring device 10, but inhibits outward movement of the separator rod 38. The exterior material 30 is thus held in place relative to the building structure 16, which preferably has an insulation layer 46 on the outside of the structure 16.

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- 8 -

While one embodiment of the invention has been shown and described, numerous variations and modifications will readily occur to those skilled in the art. The invention is thus not limited to the particular embodiment illustrated,
5 and its scope should be determined only by way of the following claims.

What is claimed is:

1. An anchoring system for installing exterior materials to a building structure, comprising:
 - 5 a separator rod having two ends;
a nut joint embedded in a hole in the side face of material to be attached to the structure, said nut joint having means for receiving and holding one end of the separator rod, while
10 allowing the other end of the separator rod to extend from the side face of the material to be attached to the structure;
an anchoring device for mounting into a hole of the structure, said anchoring device having a
15 receiving aperture dimensioned to receive the other end of the separator rod, said anchoring device further comprising ratchet means for allowing the other end of the separator rod to advance into the receiving aperture and for inhibiting movement of
20 the separator rod out of the receiving aperture.
2. The anchoring system according to claim 1, wherein the separator rod has two threaded ends.
- 25 3. The anchoring system according to claim 1, wherein the nut joint is embedded into a blind hole in the



side of material to be attached to the structure.

4. The anchoring system according to claim 1, wherein
the nut joint has a threaded female opening and
5 wherein the one end of the separator rod has a
correspondingly sized threaded male end.
5. The anchoring system according to claim 1, wherein
the ratchet means comprises flaps extending radially
10 inwardly in the receiving aperture, and wherein the
separator rod has an undulating surface on its
other end for engagement with the flaps.
6. The anchoring system according to claim 1, wherein
15 the anchoring device comprises a fastening device
having an exterior threaded surface for mounting in
a hole of the structure.
7. The anchoring system according to claim 5, wherein
20 the anchoring device comprises:
an enlarged end portion;
a speed nut received in said enlarged end
portion, said speed nut having radially inwardly
extending flaps; and
25 means for retaining the speed nut in the
enlarged end portion.

WO 93/22514

PCT/US93/03783

- 11 -

8. The anchoring system according to claim 7, wherein the means for retaining comprises an exterior male thread on the enlarged end portion and a screw cap having an internally threaded female thread to mate with the thread on the enlarged end portion.
9. The anchoring system according to claim 8, wherein the screw cap has at least one flattened edge surface for aiding in threadingly engaging the screw cap to the enlarged end portion.
10. The anchoring system according to claim 9, wherein the screw cap has six flattened edge surfaces arranged to form a hexagon.
11. A system for installing exterior materials to a building structure, comprising:
- an anchoring device for mounting into a hole in the structure, said anchoring device having a receiving aperture, an enlarged end portion having a recess larger than the receiving aperture and having a threaded male exterior;
 - a nut ring to be received within the end portion recess, said nut ring having flaps extending more radially inwardly than the diameter of the anchoring device receiving aperture;

- 12 -

a cap having means for coupling with the anchoring device for holding the nut ring within the recess, and having an aperture to align with the fastening device aperture;

5 a nut joint having means for mounting into a blind hole in the side face of material to be attached to the structure, said nut joint having an internally threaded receiving aperture; and

10 a separator rod having threaded end portions, including a first end portion for threaded engagement within the internal nut joint receiving aperture, and a second end portion for extending from the side face of the material, for being received and held by the nut ring flaps when
15 received in the anchoring device receiving aperture.

12. A method for installing exterior materials to a building structure, comprising:

20 mounting an anchoring device into a hole in the structure, said fastening device having a receiving aperture and flaps extending more radially inwardly than the diameter of the anchoring device receiving aperture;

25 mounting a nut joint into a hole in the side face of material to be attached to said structure, said nut joint having internal engagement means;

mounting a two ended separator rod into the

nut joint so that one end is engaged by the internal engagement means, and so that the other end extends from the side face of material to be mounted to the structure; and

5 inserting the other end of the separator rod into the anchoring device receiving aperture so that the flaps engage and hold the separator rod, whereby the exterior material is attached to the building structure.

13. An anchoring system for installing exterior material to a building structure, said structure having a hole defined therein for mounting the material, comprising:

a separator rod having two ends;

10 an anchoring device for mounting into the hole of the structure, said anchoring device having a receiving aperture dimensioned to receive one end of the separator rod, said anchoring device further comprising ratchet means for allowing said one end of the separator rod to advance into the receiving aperture and for inhibiting movement of the separator rod out of the receiving aperture; and

15 a nut joint adapted to be attached to the material to be attached to the structure, said nut joint having means for receiving and holding the other end of the separator rod, said nut joint having an extending flange for supporting and holding building material to the exterior of the building after the nut joint, separator rod and anchoring device are connected to the building structure.

20 14. A method for installing exterior material to the exterior surface of a building structure, said structure having a hole defined therein for mounting the material, comprising:

25 mounting an anchoring device in to the hole in the structure, said anchoring device having a receiving aperture dimensioned to receive and hold an end of a two ended separator rod; and

30 performing the following steps, not necessarily in the following order: mounting one end of the separator rod to a nut joint having internal engagement means to hold and engage one end of the separator rod, and inserting the other end of the separator rod into the anchoring device.

15. An anchoring system for installing exterior materials to a building structure,



- 14 -

substantially as hereinbefore described with reference to the drawings.

16. A method for installing exterior materials to a building structure, substantially as hereinbefore described with reference to the drawings.

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DATED this 24th day of April, 1996

10 YOUICHI ENDO and SHOZO ENDO
and SHUJI ENDO

By Its Patent Attorneys

DAVIES COLLISON CAVE



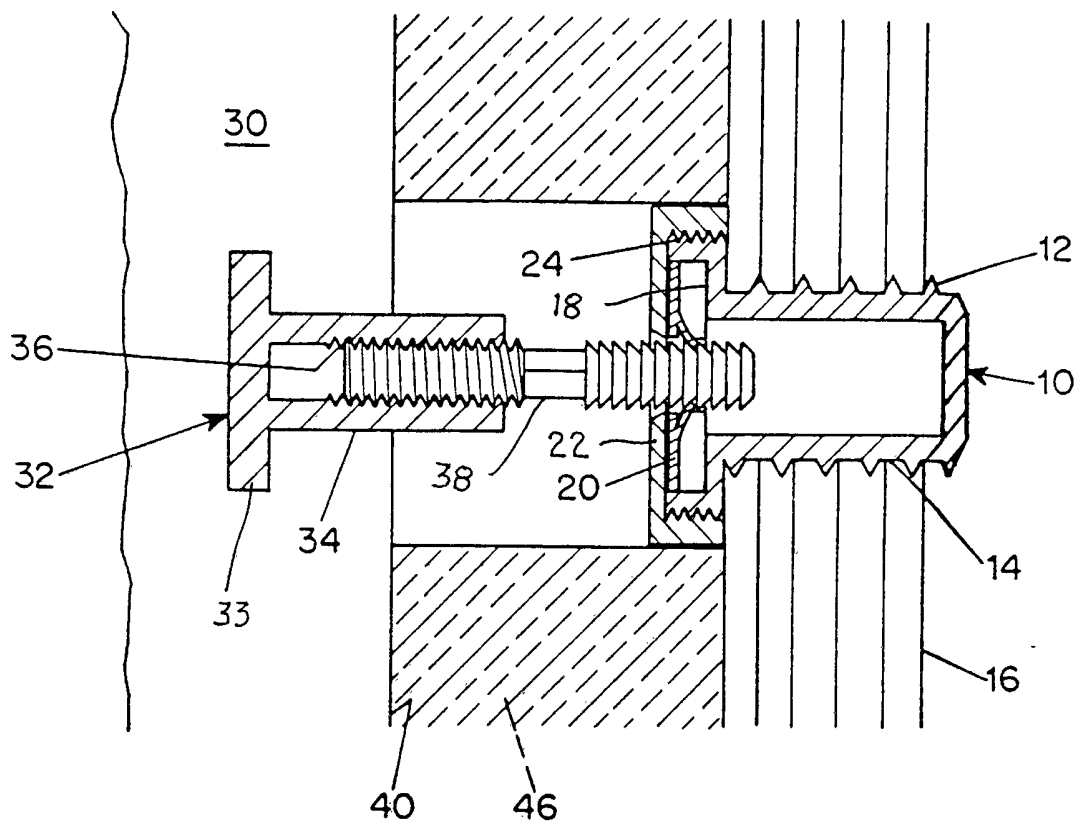
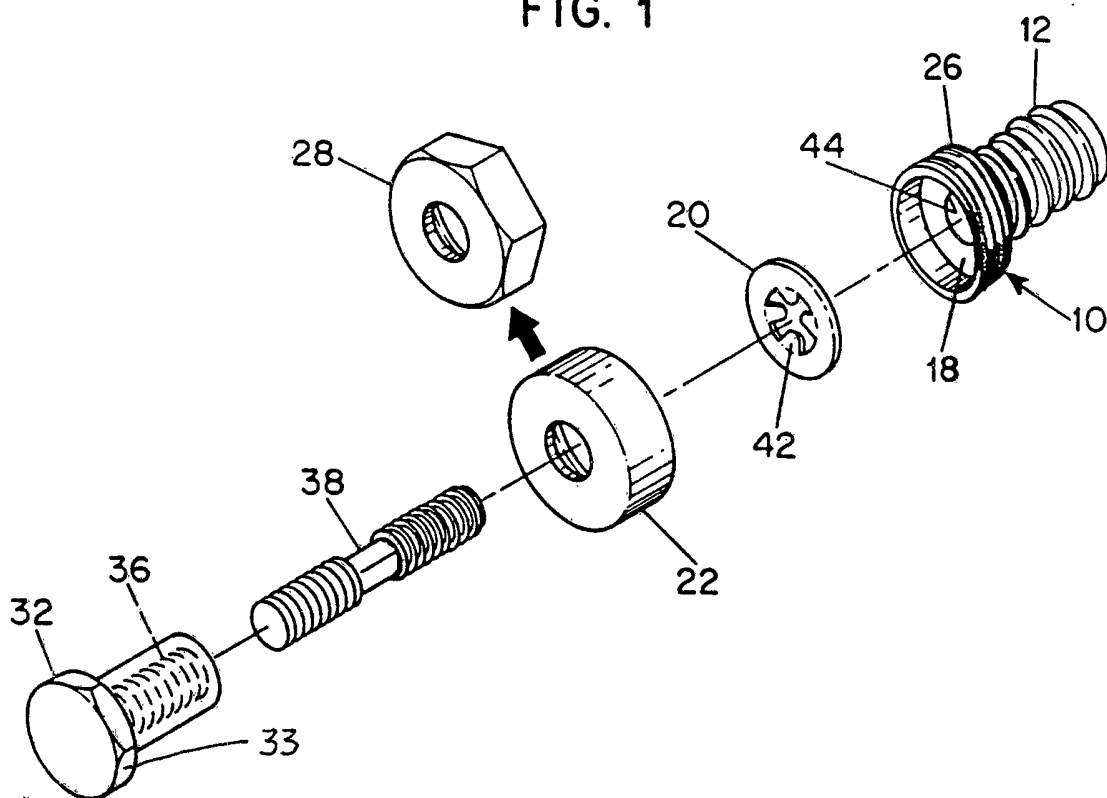


FIG. 1



INTERNATIONAL SEARCH REPORT

International application No.
PCT/US93/03783

A. CLASSIFICATION OF SUBJECT MATTER

IPC(5) : E04B 1/14

US CL : 52/511, 506, 512, 746, 704

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)

U.S. : 52/511, 508, 704, 787, 506, 512, 746, 704; 411/178, 339, 508, 509, 510, 525, 526, 527

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 practicable, 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.
A	US, A, 4,860,516 (Koller et al). 29 August 1989,	1-12
A	US, A, 4,728,236 (Kraus) 01 March 1988	1-12
A	US, A, 4,097,061 (Dietlein) 27 June 1978	1-12
A	US, A, 4,899,513 (Morris) 13 February 1990	1-12
A	US, A, 4,984,947 (Flauraud) 15 January 1991	1-12
A	DT, A, 2828438 (Lorenz et al) 22 March 1979	1-12
A	DE, B, 1246980 (Jeker) 10 August 1967	1-12
A	CH, A, 598438 (Brandlia) 28 April 1978	1-12

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

* Special categories of cited documents:	*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
A document defining the general state of the art which is not considered to be part of particular relevance	*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
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Box PCT
Washington, D.C. 20231Authorized officer
CARL FRIEDMAN

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Telephone No. (703) 308-2497