An anchor system and method to provide support in concrete construction including a concrete-embeddable body having an aperture, one or more concrete anchor legs situated on a first plane, and one or more concrete anchor members situated on a
second plane that is different from the first plane, and a strap having a matable head and an elongated strap body, wherein the matable head of the strap lockingly engages the aperture of the concrete-embeddable body.
ABSTRACT OF THE DISCLOSURE

An anchor system and method to provide support in concrete construction including a concrete-embeddable body having an aperture, one or more concrete anchor legs situated on a first plane, and one or more concrete anchor members situated on a second plane that is different from the first plane, and a strap having a matable head and an elongated strap body, wherein the matable head of the strap lockingly engages the aperture of the concrete-embeddable body.
TITLE OF THE INVENTION

ANCHOR SYSTEM FOR CONCRETE CONSTRUCTION AND METHOD THEREOF

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application claims priority of the U.S. Provisional Application No. 60/829,615 filed on October 16, 2006, in the United States Patent and Trademark Office, the disclosure of which is incorporated herein by reference in its entirety.

BACKGROUND OF THE INVENTION

1. Field of the Invention

[0002] The present general inventive concept relates to an anchor system and method for use, for example, in concrete construction, and more particularly, to an anchor system and method which includes a body having a front plate, a top plate, and a back plate and a strap inserted in body such that the body may be fixed in or to concrete or other hard building material with the strap protruding so the strap may be fixed to construction material, for example the framework of a building, steel beam, or roadway.

2. Description of the Related Art

[0003] There are several known approaches for anchoring systems for use in the construction industry. Anchor systems are used, for example, to attach two or more concrete slabs together or to attach a concrete slab to another structure. Anchoring systems can be pre or post-installed. The anchor system is either encased in concrete when the pre-fabricated wall is poured or is attached, usually by bolting, to the concrete or other material. One common anchoring systems is for the anchor to be bolted to the building structure and then a steel beam or some framework is secured, through bolting system or soldering, to the anchor.

[0004] As structures get larger and more complex, the anchoring systems need to be more versatile allowing for variety of positioning within the building structure. Also, increasing the safety and strength capacity of anchoring systems desired. The amount of load that can be attached to the anchor system is relevant. It is therefore advantageous to have an anchoring system that has increased strength potential. An anchoring system that can be used in a variety of situations for a variety of different loads is advantageous.

SUMMARY OF THE INVENTION

[0005] The present general inventive concept relates to an adjustable anchor system
and method for use in concrete construction. The present general inventive concept comprises a body with a front plate, a top plate, and a rear plate and a strap with a notch at the head for insertion in an elliptical bore in the top plate. The front plate, top plate, and rear plate are all generally rectangular in shape. The front and rear plates each have at least one leg extending from the main body of the plate and at least one member extending generally perpendicular to the plate at approximately ninety degrees. The top plate has a raised lip that is reinforced and where the angled edge of the strap fits. The body can be encased in concrete, such as a wall for a building. A strap may be inserted in the elliptical bore of the body and is fixed, by welding, soldering, or bonding, to the building framework, either a steel beam or metal plate within another piece of concrete. In the bend of the at least one member, there is a punch out. The punch out serves as another means to secure the anchor system to the building material and increases the strength and the amount the anchor system can hold. The body can be made of low corrosion metal or is coated in a J-finish or other such non-corrosive finish.

[0006] The modular design concept offers improved pullout capacity of the basic anchor system. Higher capacities are achieved by the addition of component parts, for example studs in the members of the body. The present general inventive concept may be prefabricated and manufactured using an automated process that offers consistent performance levels and reliability. Because the anchor system is prefabricated and the strap is adjustable, the cost of manufacturing the anchor system is greatly reduced. The anchor system can be adjusted to fit the needs of different building structures. The anchor system is an easy, safe, accurate and economical method to locate and connect pre-cast panels to framework while decreasing building costs.

[0007] The foregoing and other objects are intended to be illustrative of the general inventive concept and are not meant in a limiting sense. Many possible embodiments of the general inventive concept may be made and will be readily evident upon a study of the following specification and accompanying drawings comprising a part thereof. Various features and subcombinations of general inventive concept may be employed without reference to other features and subcombinations. Other objects and advantages of this general inventive concept will become apparent from the following description taken in connection with the accompanying drawings, wherein is set forth by way of illustration and example, an embodiment of this general inventive concept and various features thereof.
BRIEF DESCRIPTION OF THE DRAWINGS

[0008] A preferred embodiment of the general inventive concept, illustrative of the best mode in which the Applicant has contemplated applying the principles, is set forth in the following description and is illustrated in the drawings and is particularly and distinctly pointed out and set forth in the appended claims.

[0009] Fig. 1 is a perspective view illustrating a body of an anchor system for concrete construction of the present general inventive concept.

[0010] Fig. 2 is a top view illustrating the body of the anchor system for concrete construction of Fig. 1.

[0011] Fig. 3 is a side view illustrating the body of the anchor system for concrete construction of Fig. 1.

[0012] Fig. 4 is a front view illustrating the body of the anchor system for concrete construction of Fig. 1.

[0013] Fig. 5 is a top view illustrating a strap insert for the anchor system for concrete construction of the present general inventive concept.

[0014] Fig. 6 is a side view illustrating the strap insert for the anchor system for concrete construction of Fig. 5.

[0015] Fig. 7 is a perspective view illustrating the anchor system for concrete construction with the body engaged with the strap of the present general inventive concept.

[0016] Fig. 8 is a perspective view illustrating the anchor system for concrete construction with the body and the strap of the present general inventive concept.

[0017] Fig. 9 is a perspective view illustrating the anchor system for concrete construction in use with the strap extending from concrete.
DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0018] As required, one or more detailed embodiments of the present general inventive concept are disclosed herein; however, it is to be understood that the disclosed embodiments are merely exemplary of the principles of the general inventive concept, which may be embodied in various forms. Therefore, specific structural and functional details disclosed herein are not to be interpreted as limiting, but merely as a basis for the claims and as a representative basis for teaching one skilled in the art to variously employ the present general inventive concept in virtually any appropriately detailed structure.

[0019] One embodiment of the present general inventive concept comprises a body 12, illustrated in Figs. 1-4, and a strap 50, illustrated in Figs. 5-6, that coordinate as an anchor system 10, illustrated in Figs. 7-9. Figs. 1-4 illustrate one embodiment of the present general inventive concept comprising body 12 with a front plate 20, a top plate 40, and a rear plate 30. In one preferred embodiment the plates are generally square or rectangular in shape. Front plate 20 and rear plate 30 are parallel to each other and perpendicular to top plate 40. Front plate 20 has at least one leg 21a extending from the main body of front plate 20 in a direction away from top plate 40. Leg 21a has a bore 22a in the approximate center of leg 21a. Front plate 20 has at least one member 23a extending perpendicular to front plate 20 at approximately ninety degrees and being parallel to top plate 40. Member 23a has a bore 24a in the approximate center of member 23a. A reinforced punch 25a is located in a bend 26a of the angle where member 23a extends. Rear plate 30 has at least one leg 31a extending from the main body of rear plate 30 in a direction away from top plate 40. Leg 31a has a bore 32a in the approximate center of leg 31a. Rear plate 30 has at least one member 33a extending perpendicular to front plate 30 at approximately ninety degrees and being parallel to top plate 40. Member 33a has a bore 34a in the approximate center of member 33a. A reinforced punch 35a is located in a bend 36a of the angle where member 33a extends. Fig. 2 illustrates the manner in which the members (23a, 23b, 33a, and 33b) extend away from the main part of the body 12. Top plate 40 has a large elliptical bore 41. In one preferred embodiment elliptical bore 41 is almost as large as top plate 40. A raised lip 42 surrounds the opening of elliptical bore 41, and is raised and extends away from the body 12.

[0020] In a preferred embodiment, body 12 will have 3 legs and 2 members on both the front plate 20 and the rear plate 30 for a total of 6 legs (21a, 21b, 21c, 32a, 32b, and 32c) and 4 members (23a, 23b, 33a, and 33b). Fig. 2 illustrates a top view of a preferred embodiment with
members 23a, 23b, 33a, and 33b extending away from the main part of body 12.

[F0021] Figs. 5 and 6 illustrate strap 50. Strap 50 comprises a head 54 and a strap body 53 and an end 53 where head 54 is smaller than strap body 53. Head 54 has a notch 51. Strap 50 has an angled edge 55 between notch 51 and strap body 53. Strap 50 engages with body 12 by insertion in elliptical bore 41. Angled part 55 is sized and shaped to correspond to matingly engage with raised lip 42. Fig. 7 illustrates one embodiment of the anchor system for concrete construction fully assembled. Strap body 53 is welded to a plate (not illustrated) embedded into a concrete slab or a steel beam of a building.

[F0022] The anchor system is used in the construction industry to strengthen the framework of a building and is used as a connector of various construction pieces in a commercial building that is built with concrete and steel beams. In one preferred embodiment, the anchor system is encased in concrete when the concrete is poured for the building. Often building walls are first poured and then lifted into place for the building. When the concrete is poured, it is common to have other support materials within the walls. Fig. 9 illustrates the use of the anchor system in concrete where the body is encased in concrete and the elliptical bore can be seen with the strap sticking out of the concrete structure. The strap may then be attached, for example, by soldering to the framework of a building or structure, to a steel beam, and/or a metal plate within another piece of concrete. In one embodiment, the strap used is a flat strap as illustrated in Figs. 5-7. In another embodiment, illustrated in Fig. 8, the strap used is threaded on one end and that end is coupled to the body of the anchor system 10. Fig. 8 illustrates an embodiment where studs 61 are coupled to the bores (e.g., 34a) in the members (e.g., 33a) of the body 12 for added reinforcement when embedded in concrete.

[F0023] In some structures it is advantageous to run metal lines within the concrete as well and the anchor system 10 such that metal lines may be run through one or more of the bores (e.g., 22a) in the legs (e.g., 21a) and/or one or more of the bores (e.g., 34a) in the members (e.g., 33a) of the body.

[F0024] In one embodiment, the anchor system 10, including the body 12 and the strap 53, is coated in a less corrosive finish, for example a J-finish.

[F0025] In the foregoing description, certain terms have been used for brevity, clearness and understanding; but no unnecessary limitations are to be implied therefrom beyond the requirements of the prior art, because such terms are used for descriptive purposes and are intended to be broadly construed. Moreover, the description and illustration of the general
inventive concept are by way of example, and the scope of the general inventive concept is not limited to the exact details illustrated or described.

[0026] Although the foregoing detailed description of the present general inventive concept has been described by reference to an exemplary embodiment, and the best mode contemplated for carrying out the present general inventive concept has been illustrated and described, it will be understood that certain changes, modification or variations may be made in embodying the above general inventive concept, and in the construction thereof, other than those specifically set forth herein, may be achieved by those skilled in the art without departing from the spirit and scope of the general inventive concept, and that such changes, modification or variations are to be considered as being within the overall scope of the present general inventive concept. Therefore, it is contemplated to cover the present general inventive concept and any and all changes, modifications, variations, or equivalents that fall within the true spirit and scope of the underlying principles disclosed and claimed herein. Consequently, the scope of the present general inventive concept is intended to be limited only by the attached claims, all matter contained in the above description and illustrated in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

[0027] Having now described the features, discoveries and principles of the general inventive concept, the manner in which the general inventive concept is constructed and used, the characteristics of the construction, and advantageous, new and useful results obtained; the new and useful structures, devices, elements, arrangements, parts and combinations, are set forth in the appended claims.

[0028] It is also to be understood that the following claims are intended to cover all of the generic and specific features of the general inventive concept herein described, and all statements of the scope of the general inventive concept which, as a matter of language, might be said to fall therebetween.
CLAIMS

What is claimed is:

1. An anchor system to provide support in concrete construction comprising:
   a concrete-embeddable body having an aperture, one or more concrete anchor legs extending from the concrete-embeddable body and situated on a first plane, and one or more concrete anchor members extending from the concrete-embeddable body and situated on a second plane that is different from the first plane; and
   a strap having a matable head and an elongated strap body;
   wherein the matable head of the strap lockingly engages the aperture of the concrete-embeddable body.

2. The anchor system according to claim 1, further comprising:
   a lip extension portion situated around a circumference of the aperture of the concrete-embeddable body.

3. The anchor system according to claim 1, further comprising:
   a neck portion on the strap having upper, lower, and inner abutment surfaces that are sized and shaped to partially surround the lip extension portion.

4. The anchor system according to claim 1, wherein the strap is inserted within the embeddable body via the aperture.

5. The anchor system according to claim 1, wherein the strap lockingly engages the embeddable body via a rotation of the strap.

6. The anchor system according to claim 1, wherein the strap lockingly engages the embeddable body via a threaded end of the strap and a corresponding threaded portion of the aperture.
7. The anchor system according to claim 5, wherein the rotation of the strap is a 90 degree rotation.

8. The anchor system according to claim 1, wherein the aperture is elongated from a first end of the embedded body to a second end of the embedded body to permit various positioning of the strap at the first end, the second end, and anywhere therebetween.

9. The anchor system according to claim 1, further comprising:

one or more apertures through each of the one or more concrete anchor members; and

one or more apertures through each of the one or more concrete anchor legs.

10. A method of using an anchor system to provide support in concrete construction comprising:

embedding a body into a portion of concrete, the body having an aperture that extends from the portion of concrete, one or more concrete anchor legs extending from the body and situated on a first plane to anchor the body into the portion of concrete, and one or more concrete anchor members extending from the body and situated on a second plane that is different from the first plane to anchor the body into the portion of concrete; and

mating a strap having a head and an elongated strap body to the aperture of the body.

11. The method of using the anchor system, further comprising:

extending one or more studs through one or more apertures through the concrete anchor legs and concrete anchor members.
12. The method of using the anchor system, wherein the body is formed from a single piece of metal.
Application number / numéro de demande: 2606736

Figures: 7 8 / figures 9

Pages: 3/4 - 4/4

Unscannable item(s) received with this application
To inquire if you can order a copy of the unscannable items, please visit the CIPO WebSite at HTTP://CIPO.GC.CA

Item(s) ne pouvant être balayés
Documents reçus avec cette demande ne pouvant être balayés.
Pour vous renseigner si vous pouvez commander une copie des items ne pouvant être balayés, veuillez visiter le site web de l'OPIC au HTTP://CIPO.GC.CA