

April 30, 1968

L. VITA

3,380,253

APPARATUS FOR CONTROLLING EROSION

Filed Feb. 21, 1966

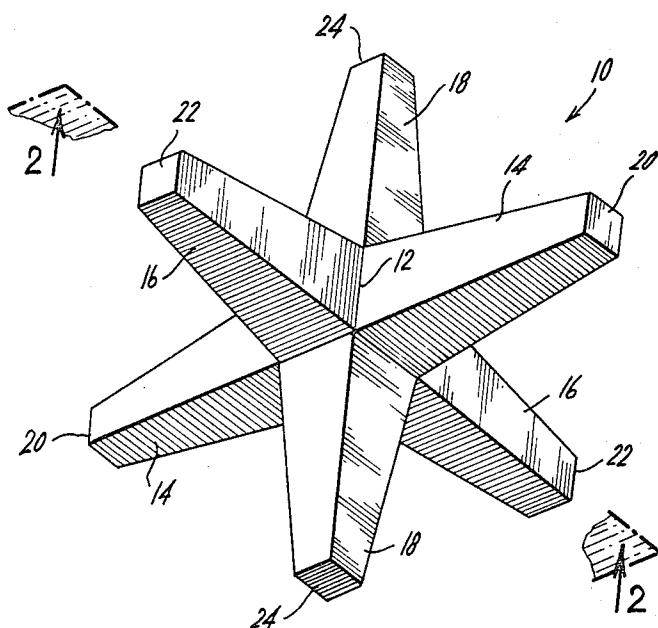


FIG. 1.

FIG. 2.

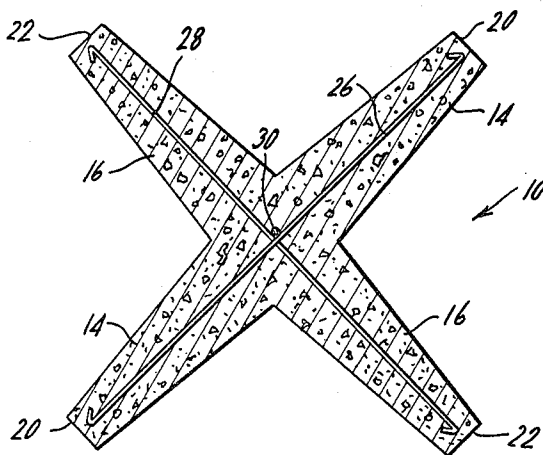
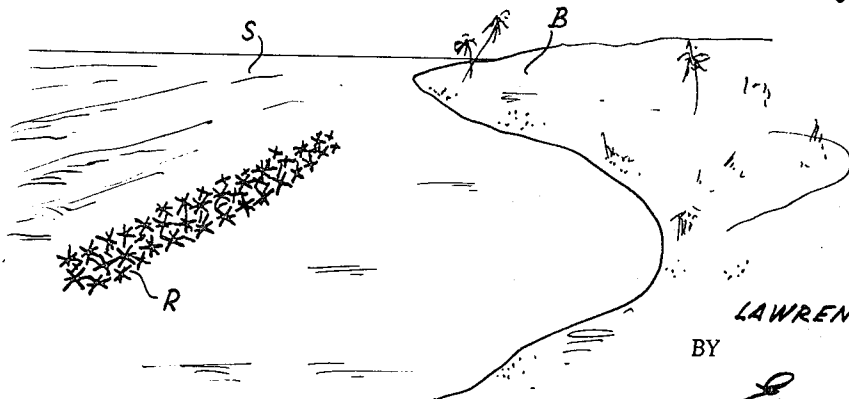


FIG. 3.



INVENTOR
LAWRENCE VITA
BY
Edward F. Levy
ATTORNEY

1

3,380,253

APPARATUS FOR CONTROLLING EROSION

Lawrence Vita, 1521 SW. 21st St.,

Fort Lauderdale, Fla. 33305

Filed Feb. 21, 1966, Ser. No. 528,999

5 Claims. (Cl. 61—3)

ABSTRACT OF THE DISCLOSURE

Apparatus for controlling erosion caused by moving water, consisting of a plurality of six-pronged jacks each molded integrally of concrete with the six prongs extending in different directions from a common central core of the same size as the base of the prongs. Each prong is in the shape of an elongated truncated pyramid having four planar sides defining sharp corners and the prongs of the adjacent jacks piled in random order are adapted to interlock to form a self-supporting rigid vertical structure such as an artificial reef having interconnecting small sharp-edged apertures.

This invention relates generally to apparatus for controlling the erosion of land and more particularly pertains to apparatus comprising a plurality of jacks which are adapted to be placed off-shore adjacent to a portion of land as, for example, a section of beach property, thereby to provide an artificial reef for the build-up of a sand bar.

The control of the erosion of beaches and the like present many serious problems particularly in resort areas where the need for a beach is of paramount importance to the success of the particular resort. Thus, it has been found that the effect of wave damage after a storm is to flatten and deplete beaches with the resultant loss of thousands of cubic yards of sand. While many solutions have been advanced and attempted in the past to ameliorate this erosion condition, such as to erect barriers of one type or another, these solutions have not proved feasible for one or a number of reasons. A primary disadvantage has been the fact that the solutions usually were not economically feasible in that they required the use of many men and complex types of machinery for erecting such barriers.

Accordingly, an object of the present invention is to provide apparatus for controlling the erosion of beaches which is simple in construction and economical to manufacture.

Another object of the present invention is to provide apparatus for controlling the erosion of beaches and the like which can be manufactured near the site where such apparatus is to be located.

Still another object and feature of the present invention resides in the novel details of construction providing apparatus of the type described which requires a minimum amount of personnel and machinery to place the apparatus in position for use.

In furtherance of the above objects, the apparatus of the present invention comprises a plurality of concrete jacks. Each of the jacks comprises a central core having outwardly extending prongs. The plurality of jacks are adapted to be placed in the sea, off-shore from the particular beach, and piled on top of one another so that the plurality of jacks form an artificial reef having a substantially triangular elevation. The prongs of each jack interlock with the prongs of adjacent jacks to provide a substantially rigid structure for dissipating the force of the waves and yet providing a structure having voids for the movement of water therethrough. Thus, the sand carried by water receding from the beach will deposit

2

on the jacks to form a sand bar to prevent the further erosion of the beach area.

A feature of the present invention is to provide apparatus for controlling the erosion of beach areas by the sea which comprises a plurality of jacks which interlock with each other regardless of their orientation. Hence, the apparatus may be positioned through random dumping off-shore by a single person without the need for complicated equipment thereby resulting in a great saving in cost.

A further feature of the present invention is to provide apparatus of the type described which can easily be placed within voids in off-shore reefs thereby making such reefs continuous and improving their effectiveness as wave breakers.

In accordance with the invention, there is provided apparatus for controlling erosion in the nature of a plurality of jacks, each of which is molded integrally of concrete and including a central core having six equal square sides and three pairs of elongated prongs of square cross-section projecting from said central core in equal directions with the prongs of each pair in axial alignment and the three pairs in mutually perpendicular planes. Each of the prongs is in the form of an elongated truncated pyramid having its base at said central core and having four side walls meeting at sharp corners, and a planar free end wall. The side walls taper inwardly toward each other from said base to said free end wall, and the base of each prong has the same size and shape as the side of the central core from which it projects.

Other objects and advantages of the present invention will become more apparent from a consideration of the following detailed description when taken in conjunction with the accompanying drawings, in which:

FIG. 1 is a perspective view of a jack constructed according to the present invention;

FIG. 2 is a sectional view of a jack taken along the plane 2—2 of FIG. 1; and

FIG. 3 is a perspective view of a plurality of jacks constructed in accordance with the present invention, showing their location as they would be positioned off-shore to prevent the erosion of a beach.

It is to be noted that the apparatus of the present invention will be described in conjunction with the prevention of erosion of a beach area. However, this description is by way of example only and is not to be interpreted as a limitation to the present invention. That is, the apparatus of the present invention may be utilized to prevent the erosion of any land property which may be subject to erosion by a neighboring body of water.

The apparatus of the present invention comprises a plurality of concrete jacks, one of which is shown in detail in FIGS. 1 and 2 and is designated generally therein by the numeral 10. The jack 10 includes a central core 12 and three pair of opposed, outwardly-extending prongs 14, 16 and 18. The axes of the pairs of prongs 14, 16 and 18 intersect each other at the center of the central core 12 and they are mutually perpendicular to each other so that the pairs of prongs 14, 16 and 18 lie in three mutually perpendicular planes. Each prong includes four substantially equally dimensioned side walls which taper inwardly toward the axis of the prong and which terminate in respective flat top walls 20, 22 and 24. Accordingly, each prong is in the shape of a truncated rectangular pyramid.

Reinforcing metal rods extend axially through each of the pair of prongs 14, 16 and 18. Thus, as shown in FIG. 2, a reinforcing rod 26 extends through the opposed pair of prongs 14 and a reinforcing rod 28 extends through the opposed pair of prongs 16 while a rein-

forcing rod 30 extends through the opposed pair of prongs 18. The reinforcing rods add to the structural strength of the jacks 10 in the conventional manner.

As an example of the dimensions of a jack 10, the central core 12 has width, length and height of eight inches. The top walls 20, 22 and 24 of the respective pairs of prongs are approximately four inches on a side and each prong has a length of 21½ inches. It is to be noted that these measurements are by way of example only and not by way of limitation.

In operation, a plurality of jacks 10 are adapted to be located in the sea S (FIG. 3) off-shore from a beach B to form an artificial reef R. More particularly, the jacks 10 are placed in approximately ten feet of water and are piled on top of each other in succeeding layers. In practice, each succeeding layer contains a smaller number of jacks than the next lower layer and it is centrally located with respect to the next lower layer so that the elevation of the reef R is substantially triangular in shape. That is, the side walls of the reef R taper upwardly and inwardly to an apex. The reef R is built up so that it projects above the water line at high tide thereby to notify ships of its existence.

As a feature of the present invention, the prongs extending from any one jack in the reef R are automatically interlocked with the prongs from the adjacent jacks to thereby form a substantially rigid structure having a plurality of voids between the individual jacks 10. Because of such open arrangement, the reef R is able to dissipate the force of the waves in the sea S and yet still allow the passage of water therethrough. The water receding from the beach B and carrying particles of sand in suspension will deposit the sand on the reef R until, after sufficient interval of time, the reef R will be completely covered with sand, thereby forming a sand bar to prevent further erosion of the beach B by the sea S. The sand in some installations will build up only part of the way along the jack formations, leaving the entire upper portion with open voids which are ideal for breaking and stilling the water.

Since the reef is comprised of the individual jacks 10, the reef R may actually be erected by a single person even though the sea is rough at the time the reef is laid. Moreover, the jacks 10 may be placed on one another in any fashion since they will lock together regardless of how they are oriented relative to each other.

The voids formed by piling the jacks on top of each other provide excellent breeding grounds for fish, and also find service in providing protective areas for small fish, protecting these small fish from being devoured by larger ones.

In some instances the jacks may be submerged as much as ten feet or even more below water level to form an artificial submerged reef running parallel to the shore line so that boats may pass thereabove without running aground.

Accordingly, an apparatus has been provided for controlling the erosion of a beach which is simple in con-

struction, economical to manufacture, and which may be placed in use at a minimum of cost to the user.

While a preferred embodiment of the invention has been shown and described herein it will be obvious that numerous omissions, changes and additions may be made in such embodiment without departing from the spirit and scope of the present invention.

What I claim is:

1. Apparatus for controlling erosion comprising a plurality of jacks, each of said jacks being molded integrally of concrete and including a central core having six equal square sides, and three pairs of elongated prongs of square cross section projecting from said central core in different directions, with the prongs of each pair in axial alignment and said three pairs being in mutually perpendicular planes, each of said prongs being in the form of an elongated truncated pyramid having its base at said central core and having four planar side walls meeting at sharp corners, and a planar free end wall, said side walls tapering inwardly toward each other from said base to said free end wall, the base of each prong having the same size and shape as the side of the central core from which it projects, said jacks being arranged in close relationship to form said apparatus along a water front and said prongs of adjacent ones of said jacks being in interlocked relationship to hold said jacks in said arrangement.

2. Apparatus for controlling erosion according to claim 1 in which each side wall of each prong has a width at the base thereof substantially twice the width of said side wall at the free end thereof.

3. Apparatus for controlling erosion according to claim 2 in which the length of each side wall is at least twice the width of said side wall at the base thereof.

4. Apparatus for controlling erosion according to claim 3 in which each jack is molded with a reinforcing rod extending axially through each pair of prongs.

5. Apparatus for controlling erosion according to claim 1 wherein said plurality of jacks are piled one above the other in a plurality of layers with the jacks in random arrangement and the prongs of each jack interlocked with prongs of adjacent jacks to provide a rigid, vertical self-supporting structure having steeply inclined walls and a plurality of intercommunicating sharp edged voids between adjacent jacks.

References Cited

UNITED STATES PATENTS

Re. 24,632	4/1959	Danel et al.	61—4
1,554,605	9/1925	Smith	61—3
1,973,821	9/1934	Mason	61—4 X
2,803,113	8/1957	Hoad	61—4

FOREIGN PATENTS

1,043,765	6/1953	France.
86,352	2/1951	Norway.

EARL J. WITMER, *Primary Examiner*.