METHOD OF PROTECTION FOR SLOPES AND CRESTS OF RIVERS, CHANNELS, AND THE LIKE

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ABSTRACT
A method is disclosed for protecting slopes and crests of rivers, channels, and the like by mooring flexible and permeable tubular casings filled with fresh concrete. Those tubular casings may be made of synthetic fibers, burlap, canvas, etc., and are simultaneously filled with fresh concrete while being placed at the foot of surfaces which must be protected. The tubular casing is lowered by gravity to its position by means of a series of ropes tied to the tubular casing at one of their ends with the other end of the ropes being secured to an element placed at the surface of the water. The ropes provide guides for the mooring of other casings similar to the above-mentioned one with the rolls, loops or rings or any other element being used for aligning purposes through which ropes of the first casing may pass so that the following casing necessarily are placed one over the other until the rolls appear at the surface of the water.

1 Claim, 2 Drawing Figures
METHOD OF PROTECTION FOR SLOPES AND
CRESTS OF RIVERS, CHANNELS, AND THE LIKE

This invention relates to protective slope covering
techniques and constitutes an improvement which
enlarges the possibilities of a protective system described
in Argentine Patent No. 186239 by which new prob-
lems may be solved and by which the construction pro-
cedure may be simplified therefore decreasing costs.

Described in Argentine Pat. No. 186239 is a slope
protection technique which generally comprises the
use of ropes to guide, under water, the constitutive ele-
ments of the protective slope covering in such a man-
er that the elements may be placed one after the other
in a convenient position. An improvement on the tech-
nique disclosed in Argentine Pat. No. 186239 can be
found in Argentine Additional Pat. No. 189,791, which
improved technique comprised the use of bags or sacs
in the manufacture of said elements of the protective
slope covering, thus eliminating forms and providing an
advantage mainly of an economic nature. Both these
prior techniques require mooring of a large amount of
elements and special attention must be rendered in the
placing of the elements so that they may finally be ade-
quately interlocked.

The improved technique of the present patent appli-
cation simplifies these prior operations and therefore
attains a decrease in costs and, in addition, an increase
in technical possibilities so as to solve new situations.
The technique consists in mooring successively (one
above the other) guided into place by means of ropes,
flexible and permeable tubular casings filled with fresh
concrete thus attaining a perfect fitting between each
other, such that once set, a truly continuous concrete
armour is attained.

Coastal defenses wherever piling works exist may be
adequately solved by means of these tubular casings
filled with fresh cement which may be easily adjusted
avoiding piles and joining in clear spaces. Furthermore,
another advantage obtained by the inventive techni-
que is the better adjustment of the casings to warped or
tapered surfaces.

The novel technical concept of the instant invention
which obtains these results comprises mooring flexible
and permeable tubular casings filled with fresh cement
instead of blocks such as is disclosed in Argentine Pat.
No. 186,239. The diameter and length of these casings
will vary depending on the circumstances, and they can
be manufactured of synthetic fiber, burlap, etc. As hap-
pens in the case of blocks, these tubular casings are
guided to their position by means of ropes tied to the
first moored casing. Separation of these ropes may be
larger than in the case of blocks and this is another
point which increases savings and simplifies con-
struction.

The tubular casings filled with cement moored suc-
cessively over the first one have loops or rings which
constitute the aligning bond with the above-mentioned
ropes and which are those which serve as a guide.

It is necessary to make clear that elements similar to
these tubular casings made with sheaves of willow
branches and stone nucleus, wire covers also filled
with stone, etc., have been long used in constructions
of this type and have received names such as gabions,
fascines, or mud walls, etc. The innovation of this appli-
cation is the tubular casings filled with fresh cement as
an element of protection and the relation of which is
covered by the Argentine Pat. No. 186,239 is the pre-

e
cence of the ropes which guide and carry these elements
to their correct position beneath the water.

The invention will be better understood by reference
to the appended sheets of drawings wherein:

FIG. 1 depicts the mooring process of the invention;
and

FIG. 2 depicts a detail of a part of the tubular casings
shown in FIG. 1.

Reference is now made to FIG. 1 of the enclosed
drawings which shows the mooring process of the in-
stant invention. Reference letter A indicates the first
casing filled with fresh cement which has been moored
from the pontoon or vessel D in which the concrete
equipment is installed. This first mooring has been
done by means of the ropes indicated by B, one of the
def thereof being tied to the tubular casing A, while
the other ends are fixed to a floating body C. A second
tubular casing E is moored while being filled with fresh
cement from the pontoon D. The ropes B guide the
descent of casing E, which forms the basis for placing
in sequence those passing along the ropes B in a similar
manner. The direction of the arrow F indicates the di-
rection of the current.

FIG. 2 depicts a detail of a part of the rolls A and E,
guiding ropes B being joined to the first roll and ropes
case which are also moored by gravity while simultane-
ously being filled with concrete, holding
subsequently filled tubular casings to the first, the basis
for alignment of said subsequently placed casings being
robes held by said first casing and said floating element
on the surface of the water, whereby each of said tubu-
lar casings may be placed in the desired position.