FORM 1

COMMONWEALTH OF AUSTRALIA

PATENTS ACT 1952

APPLICATION FOR A STANDARD PATENT

I/We, ANZA B.V.

of Spoorstraat 29,
Apeldoorn,
Netherlands.

hereby apply for the grant of a standard patent for an invention entitled "A method of manufacturing braided cord, twine or twisted ropes and of manufacturing a netting of said materials, in particular a net destined for fishing purposes."

which is described in the accompanying complete specification.

Details of basic application(s):

<table>
<thead>
<tr>
<th>Number of basic application</th>
<th>Name of Convention country in which basic application was filed</th>
<th>Date of basic application</th>
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<tbody>
<tr>
<td>79.08515</td>
<td>Netherlands</td>
<td>November 22, 1979</td>
</tr>
</tbody>
</table>

My/our address for service is care of CLEMENT HACK & CO., Patent Attorneys, 140 William Street, Melbourne, Victoria, 3000, Australia.

DATED this 21st day of November, 1980

LODGED AT SUB-OFFICE

ANZA B.V.

To: The Commissioner of Patents.

PF/App/1/80
Name(s) of Applicant(s)

Title

In support of the application/made by ANZA B.V.

for a patent for an invention entitled A METHOD OF MANUFACTURING BRAIDED CORD, TWINE OR TWISTED ROSES AND OF MANUFACTURING A NETTING OF SAID MATERIALS, IN PARTICULAR A NET DESTINED FOR FISHING PURPOSES.

I/We, J. Hospers and FISHING PURPOSES.

T. H. J. Kemna

C/O Anza B.V., Spoorstraat 29, Apeldoorn, Netherlands.

I/We do solemnly and sincerely declare as follows:-

1. I/x/we are the applicant(s) authorised by the abovementioned applicant to make this declaration on its behalf.

2. The basic application(s) as defined by Section 141 of the Act was/were made in the following country or countries on the following date(s) by the following applicant(s) namely:

Country, filing date and name of Applicant(s)

in Netherlands on 22nd November, 1979

by Johannes Hospers and Gerard Ten Lohuis

in on 19

3. The said basic application(s) was/were the first application(s) made in a Convention country in respect of the invention the subject of the application.

4. The actual inventor(s) of the said invention is/are Johannes Hospers, Rondo 92, 2325 AG Krimpen Aan Den IJssel, Netherlands; and Gerard Ten Lohuis, Houte 12, 7333 HR Apeldoorn, Netherlands.

5. The facts upon which the applicant(s) is/are entitled to make this application are as follows:- the said applicant is the assignee of the actual inventors.

DECLARED at APPELACON this 5th day of FEBRUARY 1981

ANZA B.V.

This form may be completed and filed after the filing of a patent application but the form must not be signed until after it has been completely filled in as indicated by the marginal notes. The place and date of signing must be filled in. Company stamps or seals should not be used.

No legalisation is necessary
A method of manufacturing a knotted net is also claimed.

Claim

1. A method of manufacturing braided cord, twine or twisted ropes including the sealing of the openings between the base filaments of the base material in which braiding, twining or twisting respectively, is carried out about a core of thermoplastic material and the product thus obtained is subjected to a treatment causing the thermoplastic core material to soften or to melt, respectively, characterized in that the said treatment of the product obtained by braiding, twining or twisting is a treatment causing the base material to shrink whilst it is held in tensioned condition.

The following statement is a full description of this invention, including the best method of performing it known to me—
A method of manufacturing braided cord, twine or twisted ropes and of manufacturing a netting of said materials, in particular a net destined for fishing purposes.

The invention relates in general sense firstly to a method of manufacturing a braided cord, twine or twisted rope including the sealing of the openings between the base filaments of the base material in which the braiding, twining or twisting respectively is carried out about a core of thermoplastic material and the product thus obtained is subjected to a treatment causing the thermoplastic core material to soften or to melt respectively. The manufacture of a braided cord, twine and rope is generally known and the sealing of such a product is performed by applying a coating to the outside thereof. From U.S. specification 2,284,728 it is known to use a core of thermoplastic material. This material after its softening has to penetrate into the spaces between the filaments or yarns by pressure applied upon the outer side of the cord, twine or rope.

The coating has the drawback that it may locally disappear by wear and tear, such a disappearance being detrimental not only as regards the appearance of the cord, twine or rope but also as regards the properties thereof because a path is created thereby for the penetration of undesirable substances, such as dirt, sand and other substances capable of deteriorating the performance characteristics of the said materials by affecting the flexibility, the strength and the dimensional stability.

If a thermoplastic core is used the pressure applied on the outside of the cord or the like does not guarantee an even distribution of the softened core material and the binding with the core can be disturbed.

The object of the invention is to provide a solution for these problems and this object is achieved in accordance with the invention in that the said treatment of the product obtained by braiding, twining or twisting is a treatment causing the base material to shrink whilst it is held in tensioned condition.

If the cord, twine or rope provided with a thermoplastic core is kept in tensioned condition the diameter thereof will become smaller. If
now simultaneously the core is softened or caused to melt by the addition of a softening agent or by a heat treatment, respectively, a tight surrounding of the core will occur due to the tension imparted to the material causing the core material to penetrate from the interior into the openings between the fibers and consequently to form a seal not subject to abrasion from the outer surface. The pressure of the base material against the core is effective over its entire tensioned length.

The invention relates more in particular to a method of manufacturing a knotted netting of braided cord, twined yarn or twisted rope made of a shrinkable, in particular a thermoplastic fiber material, said netting being made by interknotting the cords to form a reticulated network and thereupon subjecting said recticulated network in tensioned condition to a heat treatment and sealing of the openings between the filaments of the base material. It is known in general to manufacture a netting, for instance a fishing net in this way. As the base material therefore there are used yarns known to have a high strength and a high resistance to wear and tear such as polyamide yarns, in particular nylon 6 yarns. Preferably a hollow cord is braided, therefrom for such a hollow cord is flexible and allows an easy knotting. A network obtained in this way is then subjected usually to a heat treatment while either being kept or not in tensioned condition in order to fix the knots and to stabilize the material, such meaning in particular that the material is caused to shrink. In this way there is obtained a netting having meshes of the same size everywhere and having well fixed knots.

When using such a netting as a fishing net foreign matter such as sand may be deposited within the voids of the cords forming the netting, such being true in particular when using the net as a drag net. The grains of sand will positively penetrate into the sheath or construction of the cords but will not leave these parts thus causing a swelling of the cord parts and consequently causing longitudinal changes whereby deviations in the mesh width will occur.

Moreover the grains of sand in the interior of the cords are conducive to a rapid abrasion because the net is subject to continuous movements so that the fibers of the netting and the grains of
sand will be continuously in frictional movement with respect to each other.

For avoiding these drawbacks, it is true, it is known to coat the netting after the manufacture thereof with a coating envisaged to seal the openings between the fibers from the outside. A colorant may be added to this coating.

However, this coating will wear away whereupon said may again penetrate and cause the aforesaid objections. Moreover the coating will be worn away more rapidly at the location of the knots forming thickened portions for that matter which in case of a coating provided with a colorant will lead to differences in colour whereby the efficiency in fishing may be detrimentally affected. It is true some fishes like tunnies cannot observe colours but they do observe colour differences whereby the originally not-visible net will become visible for such fishes causing them to flee.

The object of the invention is not to provide also a method of manufacturing a knotted netting not exhibiting the aforesaid drawbacks anymore.

This object is attained in accordance with the invention in that in knotting the netting there is utilized a braided cord, twine or rope provided with a core of thermoplastic material, said cord, twine or rope being knotted to form a reticulated network before said network is subjected in tensioned condition to a treatment causing a softening of the core and said knotted reticulated network is tensioned at all sides and subjected to a heat treatment while being kept in the tensioned condition during the heat treatment, said heat treatment being such that during the shrinkage of the base material of the cords the thermoplastic material of the core will penetrate from the interior into the openings between the filaments and threads.

The cord, twine or rope, braided, twined or twisted, respectively, about the core and not yet being subjected to a further treatment causing the core material to penetrate to the outside yet possesses the flexibility necessary for making the knots in the reticulated network. When after the formation of the reticulated construction by knotting this network is subjected to a heat treatment causing the fibers to shrink and also causing the core to melt and provided the
network is kept from all sides intensioned condition the shrinkage will result in an increase of the tension whereby the parts of the net work present between the knots will assume a smaller diameter and consequently forcefully enclose the core which thereby will penetrate through the openings between the filaments and threads of for instance the braid to the outside. The shrinkage stress thus acquired will simultaneously cause the knots to be tightened more strongly so that the core material will also penetrate to the outside at said knots. Such a movement of the core material from the interior to the outside provides for the incasement of the filaments and a sealing of the openings between the threads. The resulting construction is subject to wear and tear in a much lesser degree and prevents the penetration of sand. When the core is provided with a colorant the described method will yield a coloured netting which will not be subject to differences in colour upon abrasion at the location of the knots.

It is of importance that the shrinkage of the material and the softening and melting of the core occur simultaneously for otherwise zones insufficiently sealed by the core material might yet be formed close to the knots.

The core is comprised of a fiber capable of withstanding the temperatures and forces occurring during the manufacturing process. Preferably a similar type of fiber will be used as that from which the sheathing is made like a core comprised of a supporting thread capable of withstanding the temperatures and forces applied during the heat treatment. Preferably there will be used a polyamide or polyester thread coated with a thermoplastic material such as a polymer on polyethylene base. The material that has to be capable of melting and penetrating into the voids of the cords during the shrinkage treatment is then supplied by the thermoplastic material whereas the inner thread of polyamide or polyester may then loose its supporting function. This supporting function is desired in order to assure that molten core material does not flow away to one side which might result in an uneven sealing.

In the manufacture of a netting it is known to fix the knots by means of a heat treatment. In accordance with the invention this heat treat-
ment is now preferably applied at a temperature above the shrinkage
temperature of the base material of the cords. In this way it is
achieved that the fixation of the knots will only occur when also the
material in the knots has had the opportunity to tighten well around
the molten core material during the shrinkage operation.

The invention will now be elucidated further in detail with reference
to the drawings, in which

Fig. 1 represents a piece of braided cord according to the
invention;

Fig. 2 shows the accommodation of the core fiber in the center
of a strand of twine or rope;

Fig. 3 shows a piece of twine or rope having several filament
bundles provided with a core thread.

Fig. 3a shows a cross section of Figure 3 and

Fig. 4 shows part of a reticulated network.

With reference to Figure 1 there is shown a braid 1 composed
of flat filament bundles like indicated at 2, said braid 1 being
braided about a core consisting of an inner thread 3, for instance
made of polyamide, coated with a layer of thermoplastic material 4.

It is not well feasible to show in the drawing that upon
termination of the treatment according to the invention the coating
layer 4 is penetrated between the filament and the openings
of the braid whereby the braid has become coherent and solid and
would likewise be completely coloured when utilizing a colorant
in the coating 4.

With reference to Fig. 2 there is shown the manufacture of
a twine starting from a core thread 3, 4 and filaments 2.

With reference to Fig. 3 there are shown three filament
bundles or strands 10, 11 and 12 provided with a core thread 3, 4
which are twisted together to form a line.

With reference to Fig. 4 there is shown a reticulated network
consisting of interknotted cords 5, 6 and 7 in which the knots are
indicated by the reference numeral 8 and 9, respectively.

The melting temperature of the coating 4 and the shrinkage
temperature of the filaments 2 should be in agreement with each
other. When employing a reticulated network made of nylon 6 and con-
structured with a core thread made of nylon 6 surrounded by a coating of a low molecular thermoplastic material. A temperature of from 50 to 90°C is a suitable temperature that may vary somewhat with respect to the indicated value dependent on the time period and the tension applied during the treatment.

For the fixation of the knots a suitable temperature will then be 125-135°C likewise dependent on the time period and the tension.

The heat treatments may be carried out in a known way by means of infrared radiation, steam, hot air, boiling liquids or high frequency radio waves.
THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:

1. A method of manufacturing braided cord, twine or twisted ropes including the sealing of the openings between the base filaments of the base material in which braiding, twining or twisting respectively, is carried out about a core of thermoplastic material and the product thus obtained is subjected to a treatment causing the thermoplastic core material to soften or to melt, respectively, characterized in that the said treatment of the product obtained by braiding, twining or twisting is a treatment causing the base material to shrink whilst it is held in tensioned condition.

2. A method of manufacturing a knotted netting of braided cord, twined yarn or twisted rope made of a shrinkable, in particular a thermoplastic fiber material, said netting being made by interknotting the cords to form a reticulated network and thereupon subjecting said reticulated network in tensioned condition to a heat treatment and sealing of the openings between the filaments of the base material, characterized in that in knotting the netting there is utilized a braided cord, twined yarn or twisted rope provided with a core of thermoplastic material, said cord, twine or rope being knotted to form a reticulated network before said network is subjected in tensioned condition to a treatment causing a softening of the core and said knotted reticulated network is tensioned at all sides and subjected to a heat treatment while being kept in the tensioned condition during the heat treatment, said heat treatment being such that during the shrinkage of the base material of the cords the thermoplastic material of the core will penetrate from the interior into the openings between the filaments and threads.

3. The method according to claim 1 or 2, characterized in that the core is provided with a colorant.

4. The method according to claim 1, 2 or 3, characterized in that the core is comprised of a supporting thread capable of withstanding the temperatures and forces applied during the heat treatment and is coated with a thermoplastic material.
5. The method according to claim 2, 3 or 4, characterized in that the heat treatment is carried out at a temperature above the shrinkage temperature of the base material of the cords.

Dated this 21st day of November 1980.

ANZA B.V.
By its Patent Attorneys,

CLEMENT HACK & CO.
