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(54) **Title**: FISH NET AND METHOD OF PRODUCING A FISH NET

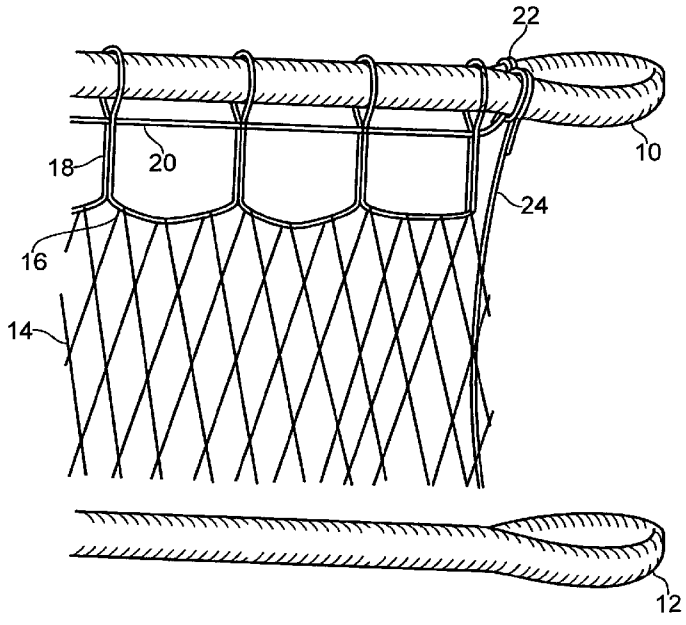

FIG. 1

(57) **Abstract**: A fishing net, comprising a buoyant top line and a weighted bottom line, with net material arranged between the top line and bottom line, said net material having upper and lower edges, said net material further comprising loops extending from the upper and lower edges and arranged over the top and bottom lines respectively, where the loops are draped about the top and bottom lines such that they are free to rotate about the top and bottom lines, and further where a separate guide line is arranged between the upper and lower edges of the net material and the top and bottom lines respectively, said loops being attached to the guide line at regular intervals.

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Fish net and method of producing a fish net

Field of the invention

The present application relates to fishing nets.

Background

250,000 to 300,000 fish nets are delivered annually to the professional fishing industry in Norway each year, and many more are delivered worldwide. The present invention is an improvement upon the inventors previously patented fishing net as described in Norwegian patent NO 326640.

As described therein, a fishing net generally comprises a floating top line, and a weighted bottom line. The netting material of the fishing net is arranged there between. NO 326640 was an improvement upon existing nets, in that the upper and bottom edges of the netting material are equipped with a series of loops arranged along a so-called "spacing line". These loops are thereafter individually attached by sewing to the top and bottom line. NO 326640 describes a method whereby the top and bottom lines are fed through a pipe or tubing, with the loops placed over the pipe. As the top and/or bottom lines are drawn out of the pipe, the loops are drawn off of the pipe, and thereafter individually sewn onto the top and/or bottom line. In practice, the loops are actually a continuous part of the so-called "spacing line", which is twisted into loops at regular intervals in an automated process. Since the loops are merely extensions of the "spacing line" itself, it is necessary to attach the individual loops to the top or bottom line, since otherwise, if a single loop were to break, the entire net could unravel from the spacing line.

The sewing of the loops onto the top or bottom line, however, has proven to not be possible to automate. This is in part due to the fact that the material of the top and bottom line is so thick and resilient that automated sewing equipment cannot be used for this operation. Consequently, the loops are sewn manually, which is a time consuming, expensive process that can cause repetitive stress injury for the workers.

A further disadvantage of the method from NO 326640 is that since the loops are sewn fast to the top and bottom lines, the netting can become twisted and tangled under use at sea.

A further disadvantage of the method from NO 326640 is that, since the individual loops are sewn onto the top line, it is difficult to remove the net from the top/bottom line, and thereby reuse the top and bottom line with new or repaired nets.

Summary of the invention

The present invention has the object of improving upon NO 326640 to provide a method for arranging the loops of the fishing net at set distances from each other, in a manner that can be performed with automated machinery. It is further an object of the invention to provide a net where the loops are not sewn directly to the top or bottom lines, such that the loops can freely rotate about the top and bottom lines. The invention has yet another object in that a damaged net can easily be removed from the top and/or bottom lines and replaced with a new or repaired net.

The present invention according to one aspect provides a net whereby loops (which are loops twisted from, and a continuous extensions of a first loop line) are sewn at regular intervals to a second, separate guide line. The spaced loops are arranged freely along, i.e. not directly attached to, a top and bottom line.

According to one aspect, a method is provided for producing such a net. According to this aspect, the top and/or bottom line are fed though a pipe, and the loops arranged about the pipe, as described in NO 326640 In addition, however, the separate guide line is drawn out along with the top/bottom line/loops. The guide line is preferably of a materially that permits an automated sewing apparatus to sew the loops onto the guide line at regular intervals, for example a material from 3-10 mm in diameter. In one embodiment, the guide line is drawn from the underside of the piping, and is held taught by a breaking mechanism to avoid slack. In yet another embodiment, a clamping/holding mechanism holds the loops in place at predefined intervals along the guide line during the automated sewing operation.

Brief description of the drawings

Figure 1 is a perspective view of a net according to the invention

Figure 2 is a perspective view illustrating the method of assembling the new according to the invention.

Figure 3 is a close up view of a clamping mechanism used in an automated procedure for assembling the net.

Figure 4 shows an alternate embodiment of the method

Detailed description

As seen in Figure 1, the net according to the invention comprises a preferably floatable top line 10, and a similar, but preferably weighted bottom line 12, and arranged there between a fishing net 14. The following structures/attachment method will be described in connection with the top line 10, but it should be understood that according to one aspect of the invention, the structures/attachments apply for the bottom line 12 as well.

The net further comprises a first loop line 16. This line is either a line onto which separate loops 18 are attached, or according to one aspect of the invention, the loops 18 are a continuous part of loop line 16, that have been twisted into such loops.

The net further comprises a second guide line 20 attached to loops 18, between loop line 16 and top line 10. The guide line 20 has the function of forming smaller loops approximately adjacent to top line 10, and further hold the individual loops at a fixed distance from each other.

As seen in Figure 1, loops 18 are not directly attached to top line 10, but are permitted to freely rotate there-about. The second guide line 20 is attached to ends of top line 10 at attachment points 22. An edge line 24 runs vertically along the edge of the net.

Figures 2 and 3 illustrate the method of assembling the net. The method is preferably automated. As seen, top line 10 (or bottom line 12 as the case may be) is passed through a pipe 26. Net 14 with a first loop line 16 and loops 18 is arranged such that loops 18 are placed over pipe 26. Guide line 20 is fed through loops 18. According to one aspect, guide line 20 is fed from a spool 28. Spool 28 may preferably employ a breaking mechanism to hold guide line 20 taught.

A sewing machine 30 attached guide line 20 to a first of loops 18. Line 20 may thereafter be drawn out, pulling net 14 (and consecutive loops 18) along with it. As each loop 18 encounter sewing machine 30, the loop is sewn to guide line 20.

As shown in Figure 3, a clamping or holding member 32 is arranged in connection with sewing machine 30 to hold the loops 18 and guide line 20 in place for the sewing operation. According to one embodiment, the clamping/holding member 32 is a plate having perpendicular grooves. Guide line 20 is pulled through a horizontal groove 34. As a loop 18 encounters a vertical grove 36, the sewing machine 30 sews the loop onto the guide line.

As shown in Figure 4, according to one aspect of the method, pipe 26 extends past the sewing machine 30. In this embodiment it is not necessary to run the top and/ or bottom lines through the pipe. Loops 18 will remain on the pipe after the sewing operation, and can be gathered together afterwards. According to this embodiment, the top and/ or bottom lines can be threaded through the gathered loops afterwards. This embodiment has the advantage of allowing the nets to be transported separate from the much heavier/bulky top and/or bottom lines.

CLAIMS

1. A fishing net, comprising a buoyant top line and a weighted bottom line, with net material arranged between the top line and bottom line, said net material having upper and lower edges, said net material further comprising loops extending from the upper and lower edges and arranged over the top and bottom lines respectively, characterized in that the loops are draped about the top and bottom lines such that they are free to rotate about the top and bottom lines, and further characterized in that a separate guide line is arranged between the upper and lower edges of the net material and the top and bottom lines respectively, said loops being attached to the guide line at regular intervals.

2. A fishing net according to claim 1, characterized in that the loops are attached to the guide line by sewing.

3. A fishing net according to claim 2, characterized in that the guide lines are attached to a leading and a trailing end of the top and bottom lines respectively.

4. A method for manufacturing a fishing net of the type having a buoyant top line, a weighted bottom line and net material arranged there between, comprising the steps of forming loops along the top and bottom edges of the net material, arranging the loops about an elongated body and successively advancing the loops along the elongated body, characterized by the further step of attaching the loops at regular intervals to a guide line, the loops at the top edge attached to one guide line and the loops at the bottom edge attached to another guide line, and arranging the loops about the top and bottom lines such that the loops are free to rotate about the top and bottom lines, and such that the respective guide line is arranged intermediate the upper and lower edges of the net material and the top and bottom lines respectively.

5. A method according to claim 4, wherein the elongated body is a hollow tube, the top and bottom lines are each fed through a hollow tube, the guide line is fed through the loops, the loops are successively removed from the hollow tubes and advanced to one or more sewing machines, said sewing machine attaching the loops at regular intervals to their respective guide line.

6. A method according to claim 4, wherein the loops are advanced along the elongated body until they encounter one or more sewing machines while said loops are still arranged about the elongated body, attaching the loops to their respective guide lines at regular intervals, removing all of the loops from the elongated body, gathering the loops together and thereafter threading the top and bottom lines through the gathered loops at the top and bottom edges respectively.

7. A method according to claim 5 wherein the guide line is arranged outside the hollow tube between the hollow tube and the edge of the net material.

8. A method according to one of claims 5-7, wherein the guide line is associated with a breaking mechanism to hold the guide line taught during the attachment operation.

9. A method according to claim 8 wherein the guide line is arranged on a spool.

10. A method according to one of claims 6-9, wherein the sewing machine is provided with a guide piece for orienting the guide line and the loops during the sewing operation, the guide piece comprising intersecting grooves, a first groove arranged for receiving the guide line and a second groove arranged for receiving the loop.

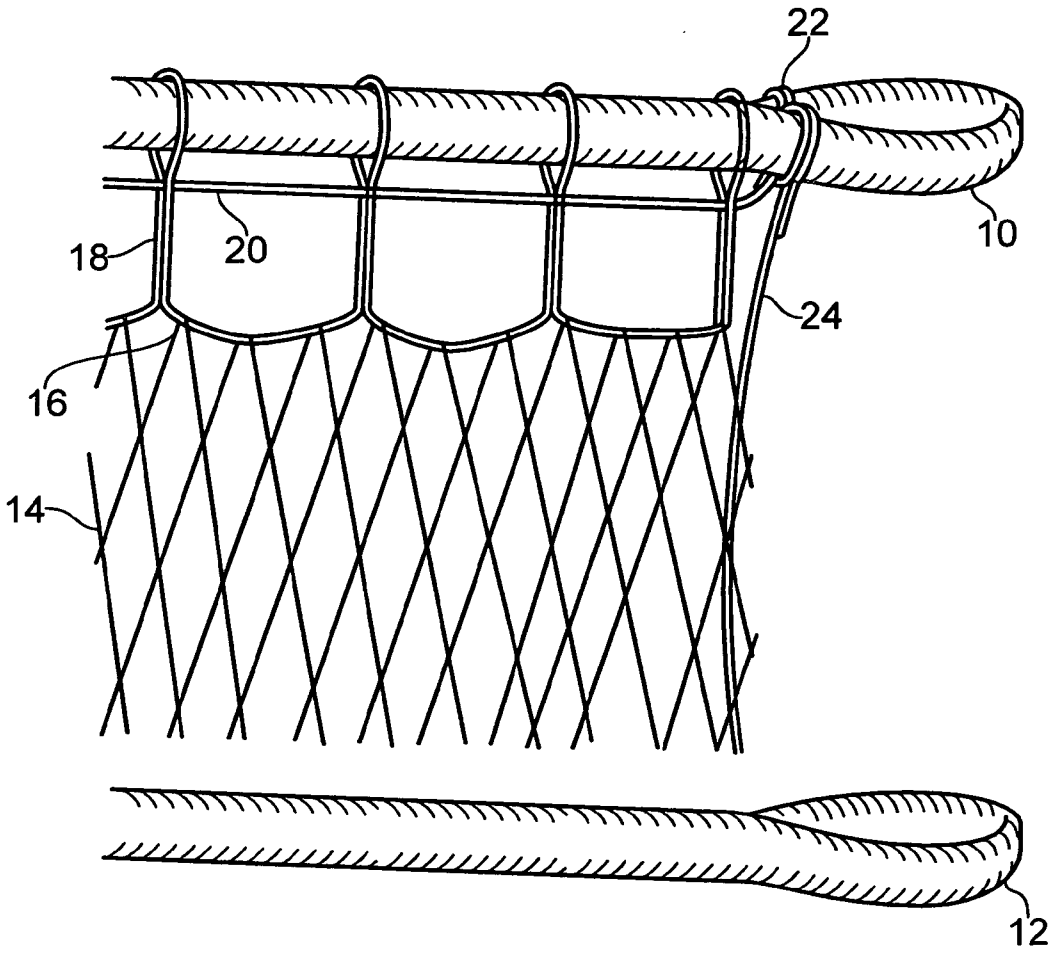

FIG. 1

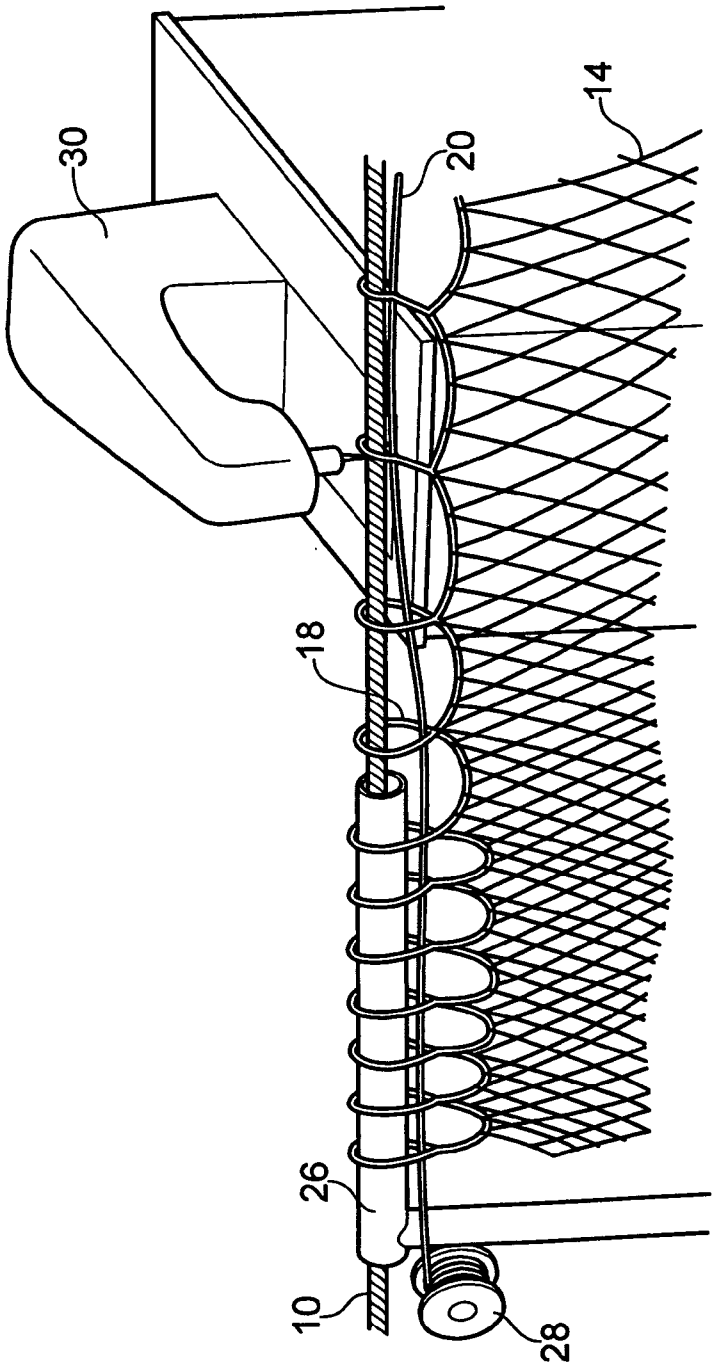

FIG. 2

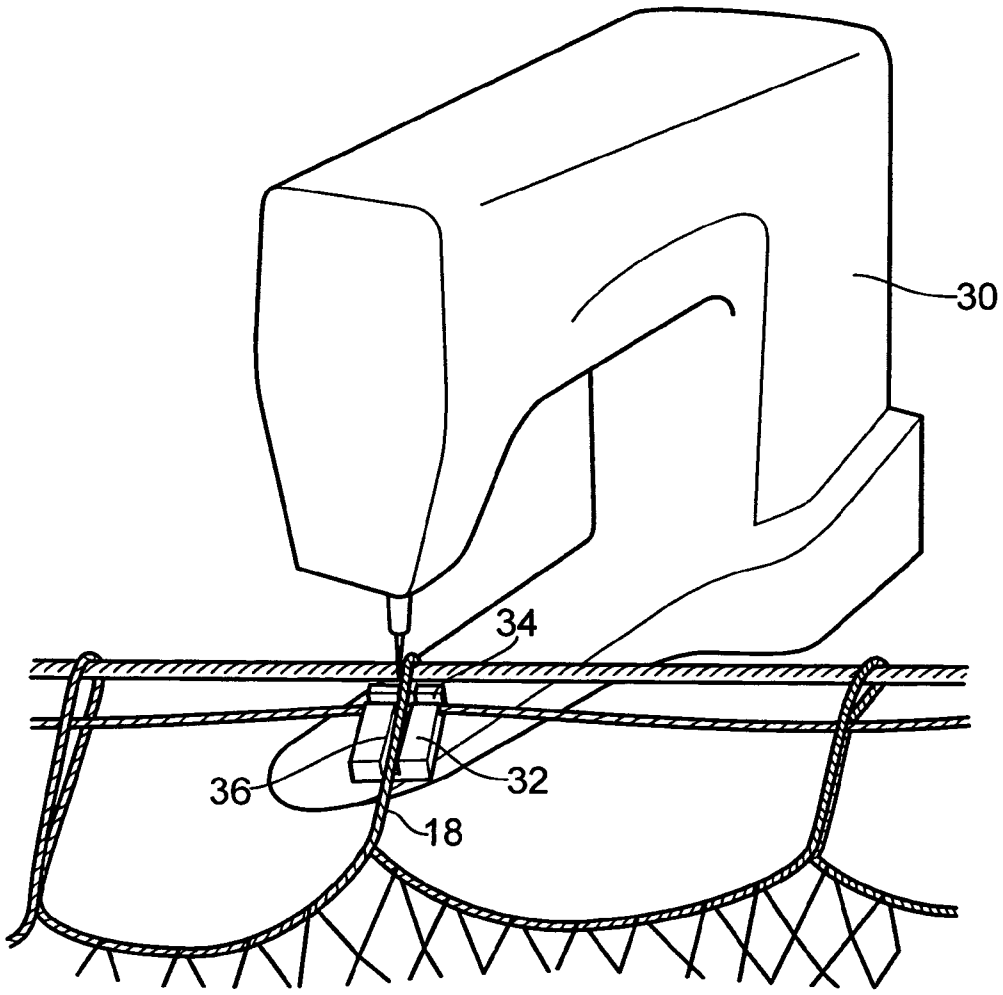

FIG. 3

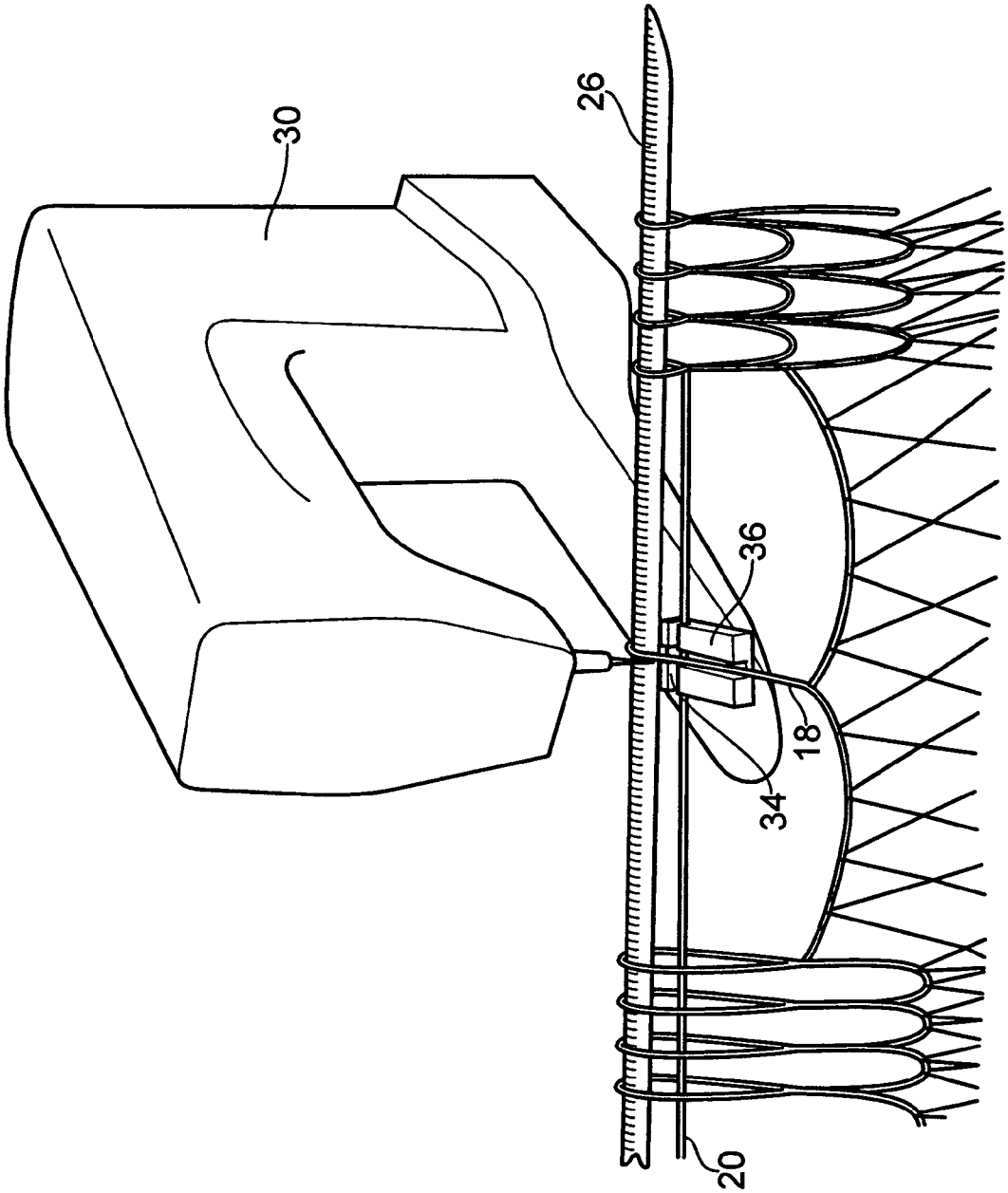

FIG. 4