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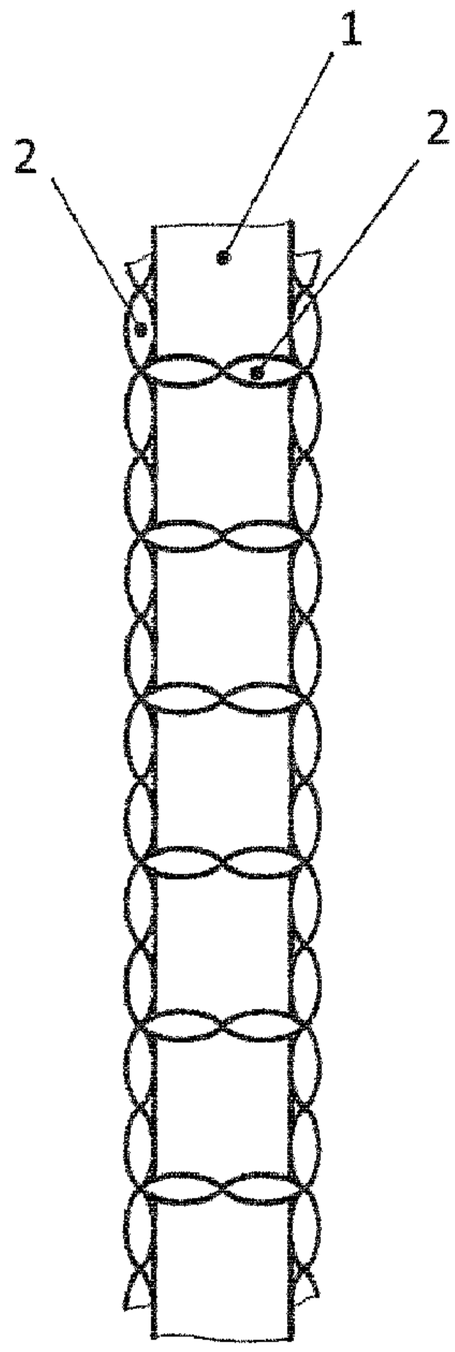
(54) Titre : PRODUIT TEXTILE LINEAIRE
(54) Title: LINEAR TEXTILE STRUCTURE

Fig. 1



(57) Abrégé/Abstract:
The invention relates to a linear textile structure, comprising at least two strands (1, 2), wherein a first strand (1) has microfibers and a second strand (2) encloses the first strand (1). With regard to the problem of providing a stable linear textile structure, by which

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(57) Abrégé(suite)/Abstract(continued):
the most effective cleaning possible can be achieved with minimum effort, said linear textile structure is characterized in that both strands (1, 2) can be brought into contact together at least in some sections and simultaneously with a surface to be cleaned.

Abstract

The invention relates to a linear textile structure, comprising at least two strands (1, 2), wherein a first strand (1) has microfibers and a second strand (2) encloses the first strand (1). With regard to the problem of providing a stable linear textile structure, by which the most effective cleaning possible can be achieved with minimum effort, said linear textile structure is characterized in that both strands (1, 2) can be brought into contact together at least in some sections and simultaneously with a surface to be cleaned.

Linear Textile Structure

Description

Technical Field

The invention relates to a linear textile structure according to the preamble of claim 1.

Background Art

Linear textile structures which in the core include an inner, first strand of microfibers which is entwined by at least one further strand of other fibers that are known in the art, especially from U.S. 2010/0263153 A1, U.S. 7,866,138 B2 or U.S. 7,749,600 B1.

It is known that the microfiber core in the interior of a linear structure is constructed in such a way that it is completely sheathed by one or more further strands for stabilization so that the desired functionalities of the microfibers, for example absorption of liquids or increase of the cleaning capacity, can only result indirectly and are therefore of little effect. The microfibers have no direct contact to any outer or external surface.

Simpler linear textile structures which consist continuously of microfibers have furthermore the disadvantage that they have little durability with respect to rough surfaces, since the microfibers get easily caught in unevennesses and are pulled out of the yarn.

In addition, the friction of the structures, especially in the wet condition is very high with respect to the surface contacted, because of their large direct contact surface, the high friction coefficient and the high weight of the soaked microfibers.

This is disadvantageous during the wiping of surfaces with cleaning apparatus made of such structures because of the high effort required. Furthermore, because of the softness of their fibres, such structures do not deliver satisfactory cleaning performance with respect to firmly adhered dirt on surfaces.

Description of the Invention

The invention before this background has the object to provide a stable linear textile structure which enables the most effective cleaning possible at low effort.

The present invention solves this object with the features of claim 1.

In accordance with the invention, it was realized that with a suitable arrangement of different strands, it is possible to design the inner strand as an actively usable part of the overall structure. At the same time, the inner strand is further stabilized by the outer strand. The linear textile structure is designed in such a way that a certain number of fibers of a first strand are bundled and held together by a certain number of one or more further strands.

During the wiping over an external surface, the outer second strand supports the textile structure partially on the surface and thereby reduces the contact force and surface of the, especially in the wet condition, heavy and high friction microfiber core and thereby the friction with respect to the surface. Because of the only partial supporting, the good absorption properties of the microfibers in relation to water and fatty dirt become effective. The outer strand thereby at the same time acts more abrasively with respect to dirt on a surface than the microfiber core alone.

By way of the combination of the soft, strongly absorbent first strand with a friction modified, abrasively active second strand with regional exposure of the core material, the durability as well as the softness and cleaning activity of the textile structure is realized.

Therefore, the above-mentioned object is achieved.

The second strand upon entwining of the first strand covers only a part of the surface of the first strand. The strands are independent bodies which are suitable for entwining but do not combine into island in the sea fibers or sheath core fibers.

The second strand can include coarser fibers than the first strand. Optimal balancing between functionality of an open microfiber strand and the further strands can be achieved because of this arrangement of the at least two strands and the partial exposure of the first

strand. The coarser fibers thereby have a higher stability and supporting function relative to a surface.

The second strand can have a higher abrasiveness than the first strand. This achieves a better cleaning capacity with respect to strongly adhered dirt.

The relative abrasiveness of the individual strands can be established by comparatively determining the removal capacity using test bodies in the form of textile sheath structures made of the respective strand materials, for example woven cloths, with respect to suitable surfaces. A so-called wash and scrubbing stability tester, BYK-Gardener GmbH, can be used, or a similar apparatus on which tests similar to DIN ISO 11998 can be carried out.

The sheathed structures are herefor moved back and forth side by side (wiping cycles) over testing plates while weighed down with the same weight until a coating applied to the test plates has been removed to about 75% by at least one test specimen.

The evaluation of the removal is carried out visually, whereby one compares whether the test specimen removed the coating over a larger surface and therefore has a higher abrasiveness within the meaning of this description.

Alternatively, one can also investigate the number of wiping cycles which are required for a comparable removal of the coating. The lower the number of the required wiping cycles, the higher the abrasiveness of the strand material.

The coating of the testing plates can be carried out as described below.

IKW-Empfehlung zur Qualitätsbewertung der Reinigungsleistung von Glaskeramik-Kochfeldreinigern" , SÖFW -Journal, 130, 1 1 -2004:

4.2 Preparation

4.2.1 Preparation of the Plates

The cleaning of the ceramic glass plates is carried out by intensive brushing with an undiluted alkali cleaner (about page 10) and subsequently with an undiluted hand-dishwashing liquid. Subsequently, the plates are left for two hours in a 50 to 60°C warm

cleaning solution of a concentrated hand washing detergent (about 2%) and a softening agent (about 8%). Subsequently, two washing cycles at 85°C are carried out with the use of a chlorinated cleaner in a lab washing machine operated with fully desalted water (washing time about 45 minutes per cycle).

4.2.2 Preparation and Application of the Soiling, Burning In Duration

The soiling is respectively prepared and processed. The soiled surface on a test plate is 30 x 9 cm (Sketch 1). The edges of the surface to be soiled are marked with a felt marker and subsequently masked with packing tape. The required amount of soiling is applied and spread by even spreading with a spiral doctor blade (for the soiling "tomato") or a film spreading apparatus (for the other soilings). The excess amount of dirt load is thereby removed from the plate. The soiling is dried overnight at room temperature before the packaging tape is removed without residue by simple peeling. The burning in of the soiling is carried out in a preheated convection heating oven at 200°C or at 240°C in the case of rice starch, whereby the temperature on the different grates should not differ by more than 10°C from the set temperature. The plates are individually placed side by side onto the grates with underlying marble locks. It must be determined in pretesting if and to what degree the removability of the soiling depends on the position of the plates during the burning-in in the oven or the position of the trace on the plate. After cooling to room temperature, the plates can be stored upright for up to 10 days."

Soiling	**Preparation**	**Burning-In Temperature**	**Burning-In Time**
Roast Gravy	Knorr® Gravy from a Tube (EAN 4038700101150) 33.3% suspension Cooked in water Application amount per plate: 15 g Layer Thickness(1): 200 µm	200 ± 10 °C	15 min
Tomato Paste	Tomato Paste (7%) (Manufacturer, Play, EAN 8002700472059) Application Amount per Plate: 15 ml Layer Thickness(1): 200 µm	200 ± 10 °C	13 min
Cream/Condensed Milk	Kleefeld® - Cream 24% Fat (EAN 4388440030044) Bärenmarke®, Die Ergiebige 10% Fat (EAN 400550081012) Application Amount per Plate: 15 g Cream/7.5 g Condensed Milk Layer Thickness(1): 25 µm	200 ± 10 °C	15 min
Lime/Starch	4% Rice Starch in Saltwater (20 +/- 4° dH, for example, City Water) see Appendix 1 Application Amount per Plate: 10 ml of the Suspension Layer Thickness(1): 25 µm	240 ± 10 °C	30 min
(1) The cited layer thickness describes only the nominal layer thickness of the doctor or the film pulling device. The thickness of the applied film results from this nominal layer thickness and the thickness of the piece of tape. The layer thickness of the applied soiling after the drying was not determined.			
Table 1 Soiling and Burning-In Conditions			

The second strand can have a lower friction relative to a surface than the first strand. The effort for the movement of a cleaning device equipped with the textile structures is hereby reduced.

The relative friction of the individual strands can be determined by detecting the static (μs) and dynamic friction coefficients (μk) of test bodies in the form of textile sheet structures of the respective strand materials, for example woven cloths, on a PVC floor covering or a floor tile.

The overall resulting friction (the friction coefficients) of the textile structure in accordance with the invention as a combination of the microfiber core with differently constructed entwining second strands can also be detected.

The fibers of the second strand can have a titer of > 1 dtex. It has been shown that the stabilizing properties of such fibers in the linear structures are especially pronounced.

The fibers of the second strand can preferably have a titer of larger than 1 dtex and less than 10 dtex. This makes their use or their further processing on conventional machinery easier. It is furthermore possible to achieve a better matching to the floor by way of several individual fibers of this yarn count. That means that one could better adjust the abrasiveness by using several thinner and lesser abrasive fibers instead of one thicker, strongly abrasive fiber. The distribution and the locations of contact to the floor can also be strengthened thereby. Multiple individual fibers provide more points of contact than one thick fiber.

The fibers of the second strand can have a titer between 10 dtex and 100 dtex. The lightly abrasive material can preferably have individual fiber yarn counts between 10 dtex and 70 dtex in order to enable an optimal support of the cleaning capacity and the occurring friction relative to a surface to be cleaned. At the same time, the material has the required yarn count to be processed together with the microfiber yarn.

The titers describe the titers of the individual fibers of which the strands consist.

The second strand may include fibers with a non-round cross-section. This increases the cleaning capacity, since dirt is better lifted from surfaces.

The second strand may be formed as a flat and planar filament more preferably as a band. The lightly abrasive material can also be formed as a tape or monofilament in order to support the abrasive effect.

The second strand, at least regionally, can have an antibacterial finish. This achieves a hygienic effect for the overall textile structure, without requirement to accordingly finish the whole microfiber core.

The second strand may be a stable fiber yarn or a monofilament.

The second strand can have a different colour than the first strand. The strands used can have different colours in order to provide a signal character for the user, also optically.

The second strand may be formed as a ladder yarn. A relatively unstable, loose microfiber strand in the core can be especially well entwined herewith.

The second strand may include two filaments which are connected with one another in such a way that they form a ladder yarn with chain stitches and constricting loops, whereby the first strand at least regionally is guided through the constricting loops.

The second strand can include two filaments which are wound in opposite directions around the first string and hereby lie one on top of the other at crossing over points. This results in a good stabilization of the textile structure and no tendency of twisting of the textile structures among themselves, as it could occur on winding in the same direction. In addition, the crossover points as of the placement of the filaments on top of one another form especially balanced supporting points.

At least one filament can be constructed as a melt filament. For stabilization of the structure, an abrasively acting yarn can be point-form melted with one another.

The first strand can be constructed as a yarn. This facilitates an effective manufacture of the textile structure.

The first strand may be formed exclusively of microfibers. The special absorption and fat cleaning properties of a correspondingly constructed cleaning device are then especially pronounced.

At least one further strand or further strands can be provided in addition to the first strand, whereby the first strand and the further strand or the further strands are entwined by the second strand. The second strand or the further strand or strands can be free of microfibers.

The further strand or strands can include abrasive fibers so that it or they are more abrasive than the first strand. This further increases the cleaning capacity.

The manufacture of the mentioned linear textile structure can be carried out, for example, on specially equipped mesh forming machines, for example on a circular knitting machine or galloon crocheting machine. This manufacture permits the use of the most diverse strand materials and provides an especially good stabilization and surface structuring of the textile sheath materials. Pearl strand like longitudinal sections and/or round, flat, triangular or rectangular cross-sections can be produced therewith. Furthermore, by way of the meshing, the second strand itself is already mainly stable. This allows for cutting of textile web structures and their processing the products without the requirement of an additional end stabilization of the cutting points.

A mop head for the positioning of a cleaning device may include a base body from which structures of the above described type with a free end or in the form of loops protrude or hang down.

The textile cleaning products described herein find use in the household and in the professional field.

Brief Description of the Drawings

In the Drawings

Fig. 1 shows a first strand including microfibers entwined by a second strand of two meshed yarns in the form of a chain stitched yarn;

Fig. 2 shows an embodiment in which the first strand is entwined by two filaments of the second strand wound in opposite directions; and

Fig. 3 shows an embodiment in which the first strand is entwined by the second strand made of two meshed yarns.

Embodiment of the Invention

Fig. 1 shows a linear textile structure, including at least two strands 1, 2, whereby a first strand 1 includes microfibers and whereby second strand 2 surrounds the first strand 1.

Both strands 1, 2 at least in some sections can together and simultaneously be brought into contact with a surface to be cleaned.

The second strand 2 surrounding the first strand 1 covers only a part of the surface of the first strand 1.

The second strand 2 includes coarser fibers than the first strand 1. The second strand 2 has a higher abrasiveness than the first strand 1. The second strand 2 has a lesser friction relative to a surface than the first strand 1. The structure has a lesser friction relative to a surface than the first strand 1 alone.

The fibers of the second strand 2 have a titer > 1 dtex. The fibers of the second strand 2 have a titer between 10 dtex and 100 dtex. The second strand 2 has fibers with non-round cross section. The second strand 2 is at least in sections provided with an antibacterial finish. The second strand 2 includes a stable fiber yarn or a monofilament.

The second strand 2 has another colour than the first strand 1.

The second strand 2 is formed as ladder yarn. Fig.1 schematically illustrates a first strand 1 which includes microfibers, entwined by a second strand 2 made of meshed yarns in the form of a ladder yarn.

The first strand 1 is exclusively formed of microfibers.

The structure is characterized by manufacture on a mesh forming machine.

Fig. 2 shows an embodiment in which the first strand 1 is entwined by two filaments of the second strand wound in opposite directions. The second strand 2 includes two filaments which are wound in opposite directions around the first strand 1 and therefore lie one on top of the other at crossing over points.

Fig. 3 shows an embodiment in which the first strand 1 is enclosed by the second strand 2 made of two meshed yarns.

CLAIMS:

1. Linear textile structure, comprising at least two strands (1, 2), whereby a first strand (1) includes microfibers and whereby a second strand (2) encloses the first strand (1), characterized in that both strands (1, 2) at least in some sections can together and simultaneously be brought into contact with a surface to be cleaned.

2. Structure according to claim 1, characterized in that the second strand (2) enclosing the first strand (1) covers only a part of the surface of the first strand (1).

3. Structure according to claim 1 or 2, characterized in that the second strand (2) has coarser fibers than the first strand (1).

4. Structure according to one of the preceding claims, characterized in that the second strand (2) has a higher abrasiveness than the first strand (1).

5. Structure according to one of the preceding claims, characterized in that the second strand (2) has a lesser friction on the surface than the first strand (1).

6. Structure according to one of the preceding claims, characterized in that the structure has a lesser friction on a surface than the first strand (1) alone.

7. Structure according to one of the preceding claims, characterized in that the fibres of the second strand (2) have a titer > 1 dtex, preferably a titer larger the 1 dtex and less than 10 dtex.

8. Structure according to one of the preceding claims, characterized in that the fibers of the second strand (2) have a titer between 10 dtex and 100 dtex.

9. Structure according to one of the preceding claims, characterized in that the second strand (2) has fibers with a non-round cross-section.

10. Structure according to one of the preceding claims, characterized in that the second strand (2) is formed as a flat and planar fibre, preferably in tape form.

11. Structure according to one of the preceding claims, characterized in that the second strand (2) at least in regions has an antibacterial finish.

12. Structure according to one of the preceding claims, characterized in that the second strand (2) includes a stable fiber yarn or a monofilament.

13. Structure according to one of the preceding claims, characterized in that the second strand (2) has a different colour than the first strand (1).

14. Structure according to one of the preceding claims, characterized in that the second strand (2) is formed as a ladder yarn.

15. Structure according to the preceding claim, characterized in that the second strand (2) includes two filaments which are connected in such a way that they form a ladder yarn with chain stitches and constriction loops, whereby the first strand (1) at least in regions is guided through the constriction loops.

16. Structure according to one claims 1 to 13, characterized in that the second strand (2) has two filaments which are wound in opposite directions around the first strand (1) and thereby lie on top of one another at crossing over points.

17. Structure according to the preceding claim, characterized in that at least one filament is constructed as a melt filament.

18. Structure according to one of the preceding claims, characterized in that the first strand (1) is formed as a yarn.

19. Structure according to one of the preceding claims, characterized in that the first strand (1) is exclusively formed from microfibers.

20. Structure according to one of the preceding claims, characterized in that at least one further strand or further strands are provided in addition to the first strand (1), whereby the first strand (1) and the further strand or further strands are enclosed by the second strand (2).

21. Structure according to one of the preceding claims, characterized by manufacture with a mesh forming machine.

22. Structure according to one of the preceding claims, characterized by manufacture on a circular knitting machine.

23. Structure according to claims 1 to 21, characterized by manufacture by way of a galloon crocheting machine.

24. Mop head for positioning on a cleaning device, comprising a base body from which structures according to one of the proceeding claims, protrude or hang down, with a free end or as loops.

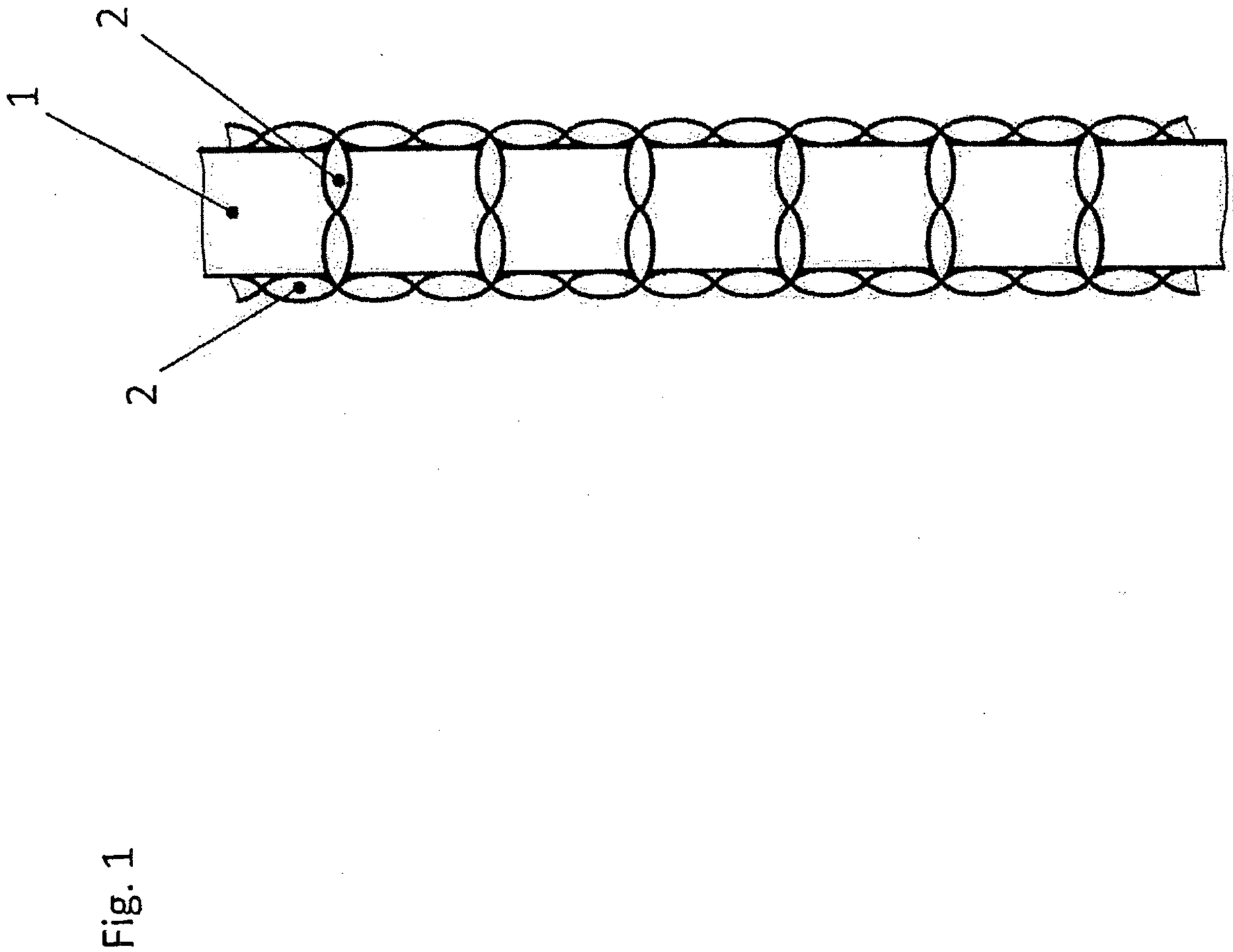
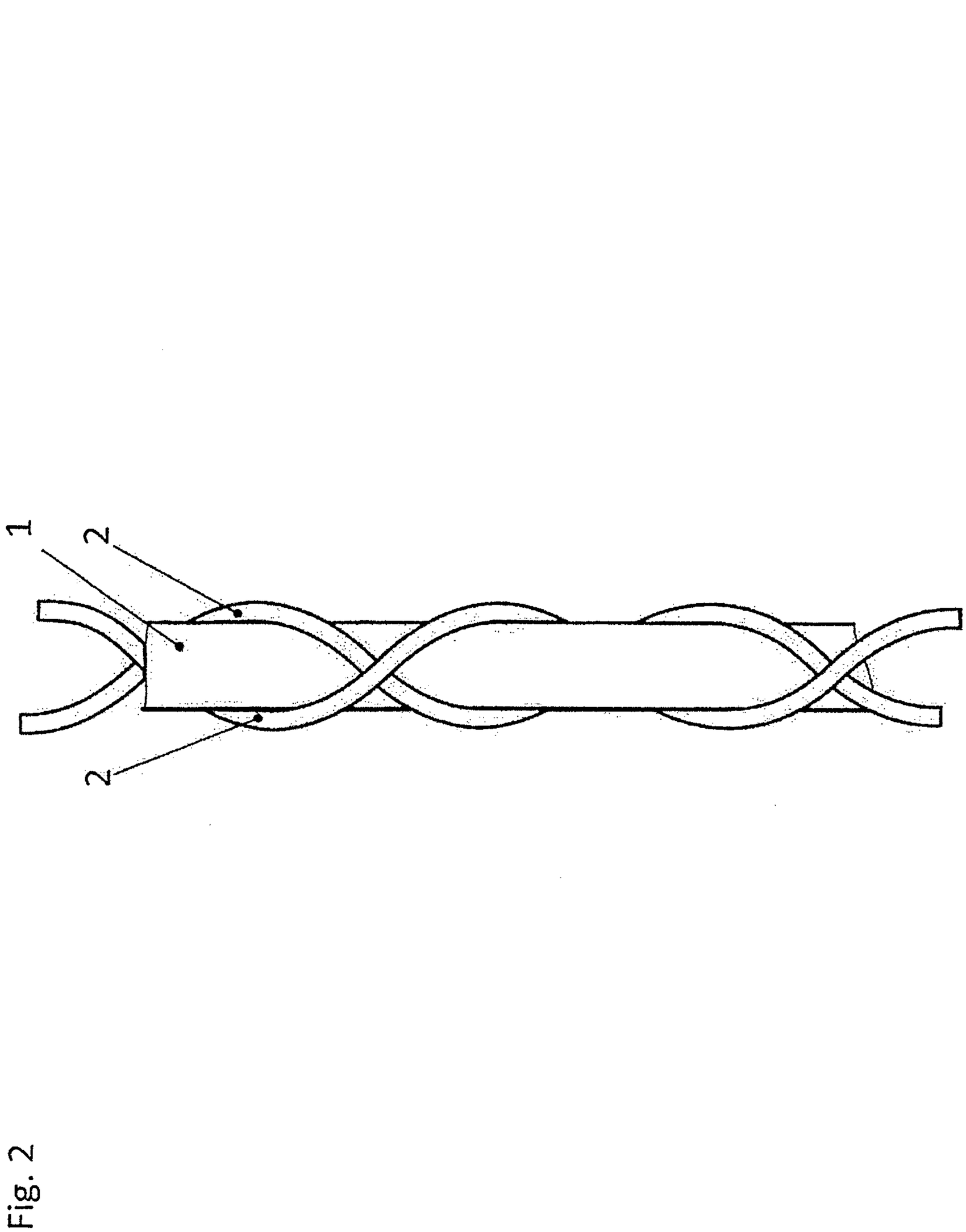


Fig. 1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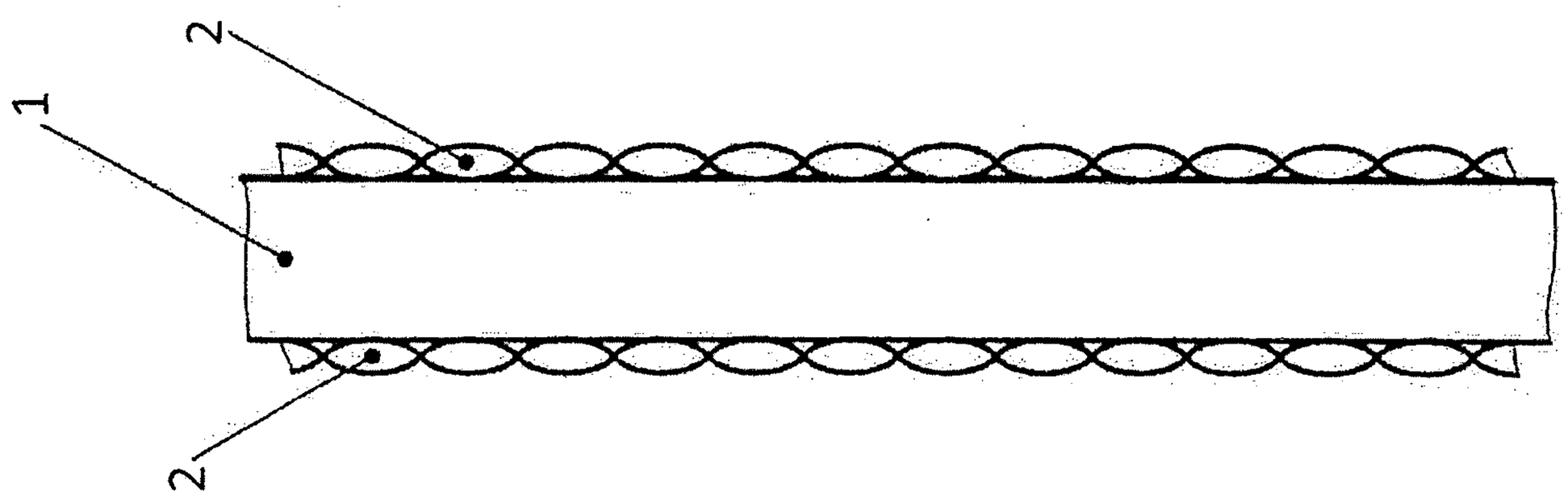

Fig. 3

Fig. 1